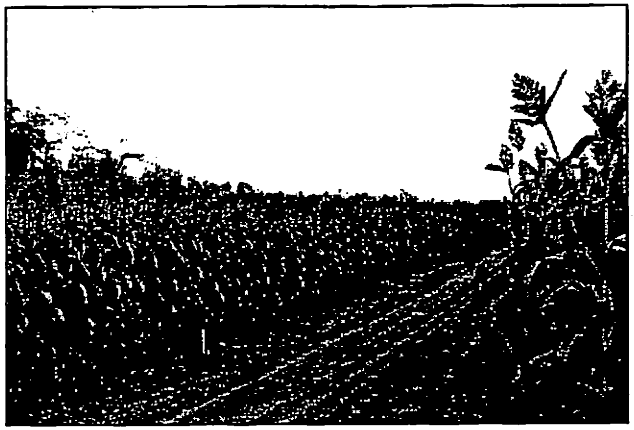
Sweet Sorghum, a Sustainable Crop for Energy Production in Europe

Results of 10 Years Experiments 1985 - 1995

EEC Contract AIR Ref. CT 920041

Final Report



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1. Summary and Conclusions

Title: Sweet Sorghum, a Sustainable Crop for Energy Production in Europe.

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The objectives of the contribution from the Institute of Crop Science of the Federal Agricultural Research Centre (FAL) as an associated proposer (07) were defined within the activities of the actions of the coordinator (01) and focused on the following topics: assist in improvement of the potential and actual productivity model by common experiments focused on actual data; improvement on optimisation of the advantages of sweet sorghum, mainly optimisation of the input nitrogen; adaptation to low temperature which limits productivity and geographical extension; and constitution and improvement of potential and actual productivity by database exploitation.

The specific objectives can be summarised as follows: determination of aerial dry matter evolution and distribution in different organs during the whole crop cycle - under optimal and non-limiting nitrogen and weather supply conditions; determination of the relationship between dry matter and the rate of intercepted radiation; determination of sugar accumulation in different growth stages and partitioning in aerial organs: stems, leaves and panicles; to supply information in order to verify the productivity model under optimum conditions which relates the aerial biomass to the quantity of interrupted PAR (Photosynthetic Active Radiation) in the given climatic region; and to test different genotypes to evaluate their aptitude to produce total biomass, sugar and ethanol at this latitude and to increase the genetic variation.

The experiments included productivity investigations, genotype trials and database collection, evaluation and documentation. The productivity trials were conducted with three nitrogen levels (50, 150 and 200 kg N/ha). The harvesting was carried out at several growth stages (interval harvesting) and various measurements were done to be included in the productivity model, i.e. aerial biomass (total, leaf, stem and panicle), leaf area, leaf area index and sugar contents.

The number of genotypes (varieties, lines and hybrids) in the genotype trials varied each year. They were tested for their total biomass, sugar contents, sugar fractions and sugar yield.

The database collection, evaluation and documentation includes meanwhile 1350 accessions of sweet sorghum examined in field trials during the last 10 years (1985 - 1995).

Meteorological measurements such as air and soil temperature, rainfall, potential evaporation and incident solar radiation were conducted regularly. The main characteristics of the investigation site are:

Location: Braunschweig, F.R. Germany

Latitude: 52° 17' 35" n.

Longitude: 10° 26' 55" e.

Altitude: 81 m

Temperature: 8.7 °C annual mean

Precipitation: 617 mm/y

Soil: loamy sand

The results achieved in this project and consequences for further research may be summarised as follows:

- The major accumulation of dry matter took place in the period of late July to mid October and the sugar accumulation from late August to early November.

- The biomass growth rate was determined in periods in which the temperature was higher than 10 °C and the most productive growth stage has been ascertained when temperatures reached 17 °C and higher.

- There was nearly linear correlation between aerial dry matter accumulation and the cumulative values of Photosynthetic Active Radiation (PAR).

- The Leaf Area Index (LAI) could be considered as an adequate indicator to predict the growth rate of sweet sorghum crops. A significant correlation could be established between growth rate and LAI.

- Temperature is by far the most deciding and critical growth factor of all climatic parameters.

- The sugar concentration within the stalk seems to be more or less uniformly distributed within the whole length of the stalk. The concentration in a cross-section indicated that the highest sugar concentration was found directly interior to the thin outer layer and decreased again towards the center of the stalk.

- The application of the productivity model for sweet sorghum might be modified to include the sugar accumulation rate, as the sugar accumulation in stems is affected by the environment as well as by the genotype.

- The theoretical ethanol yield can be calculated from the formula:

    Total sugar content (%) in fresh matter (FM) x 6.5 (conversion factor) x 0.85 (process efficiency) x total biomass (t FM/ha).

    The best genotypes could produce up to 6000 l ethanol/ha.

- The influence of the different nitrogen levels was not significant. It seems that the additional mineralisation of soil nitrogen and the atmospheric N-deposition were high enough to elevate the effect of nitrogen mineral fertilisation. Aside from these aspects, the results reflect the fact that sweet sorghum is one of the best C4 crops concerning nitrogen utilisation efficiency.

- It also seems that at higher latitudes a total biomass of about 20 tons dry matter per hectare and 10 tons sugar per hectare are possible using adequate genotypes, but there was a large variation in the results of most genotypes concerning the biomass as well as sugar production within the same genotype in different years. Under common agricultural practice the following figures could be expected: Fresh matter yield 60-80 t/ha, dry matter yield 12-16 t/ha, sugar content 6-8% in FM and sugar yield 6-8 t/ha.

- The entire evaluation data from field trials which have been conducted on 1350 genotypes during the period 1985 - 1995 are given in annex 3. The data is available from the Institute of Crop Science (FAL), along with seeds in small quantities which could be supplied to interested institutions. The following table summarises these results. It should also be mentioned that for the same genotypes in different years of evaluation, in some cases, significant variation in the results was observed.

	Distribution		Frequency	
Fresh matter yield (t/ha)	0-40	40-80	80-100	> 100
frequency per class (%)	19.1%	53.2%	16.7%	11.0%
total number per class	244	681	214	141
Dry matter yield (t/ha)	0-8	8-16	16-24	> 24
frequency per class (%)	9.6%	48.8%	33.7%	7.9%
total number per class	122	623	430	101
Total sugar content (%)	0-4	4-8	8-10	> 10
frequency per class (%)	17.3%	65.7%	14.1%	2.9%
total number per class	195	739	158	33
Sugar yield (t/ha)	0-4	4-6	6-8	> 8
frequency per class (%)	57.9%	28.1%	11.3%	2.7%
total number per class	651	316	127	30

- It may also be concluded that the sweet sorghum genotypes which have resulted from KWS breeding activities are more suitable for cultivation in Middle-Europe than the other accessions tested from world assortments.

- The results of the interaction environment x genotypes indicated that most genotypes available could not compensate for changes in the climate in different years, i.e. the buffer capacity of the genotype is still not high enough.

- The major problem for a wide introduction of sweet sorghum in Middle and Northern Europe is the insufficient cold tolerance in the early growth stages, so that several weeks after sowing, no considerable growth takes place, which may lead to soil erosion and increased weed growth.

- Further activities to develop cultivars with higher adaptability and stability features for higher latitudes (northern parts of Europe) are therefore necessary. It would be strongly advised to put more emphasis on the breeding sector of sweet sorghum to improve the agronomic features with higher stability and adaptability features. Cold tolerance, lodging resistance, high yield potential and high sugar accumulation rates are further objectives of sweet sorghum breeding work for higher latitudes.

- The large scale cultivation of sweet sorghum is affected by several major obstacles. Crudeness and inefficiency of harvesting and processing machinery, as well as a short harvesting period due to the perishable nature of the crop and a rapid loss of sucrose in the stalk between harvest and juice extraction. These bottlenecks hamper a rapid introduction of this crop into the common agricultural system. These facts should be taken into consideration in the future research and development activities.

2. Introduction

The genus *Sorghum* is in the sub-tribe *Sorghastrae* of the tribe *Andropogoneae*. *Bicolor* is the least specialised race of the five basic races of the sorghums, classified as subspecies *bicolor*. Now sporadically cultivated across the African savanna and in South and Southeast Asia, it includes modern sudan grass, sweet sorghum and broomcorn as sub-races (Anderlei, 1985; ICRISAT, 1985; Jvanjukovic, 1981; Mechelke, 1986).

It is a C4 plant species with high photosynthetic capacity. Compared with other species with high biomass yield, sweet sorghum has one of the highest dry matter accumulation rates on a daily basis. The traditional farmers in Africa and Asia grow *Sorghum bicolor* for multiple uses. Besides grain, the stem is used for fodder, fuel, rooting and fencing. Reports from developing countries indicate a decreasing of area under sorghum cultivation because of its poor demand compared to other crops such as rice and wheat. Alternate uses of sorghum in these countries are being examined. Sweet stalk sorghum can serve as a source to accomplish alternate usage objectives and will increase the market value of the crop as well as provide better use of resources of farmers.

The primary uses of sweet sorghum are as a syrup for human consumption and as a livestock feed. Recently, interest in sweet sorghum has risen in developed countries because of its potential as a source of sugar and raw material for production of energy as well as for its possible utilisation in different biotechnological processes (Dambroth and El Bassam, 1981; Wall and Ross, 1970). More recently, research activities were initiated in Europe to evaluate the potential of the sweet sorghum germplasm as a possible industrial and energy crop and to develop a sugar plant which might enlarge the diversity within the crop rotation and to overcome the enhancing phytopathological risks of nematodes and rhizomania in the sugar beet cultivated areas (Dambroth, 1985; Kresovich *et. al.*, 1983; Moritz, 1986; El Bassam *et. al.*, 1987).

At the Institute of Crop Science of the Federal Agricultural Research Centre (FAL), Braunschweig, *Sorghum bicolor* has been investigated within the framework of the EU-Project CT 920041 "Sweet Sorghum, a Sustainable Crop for Energy Production in Europe," to improve the basic knowledge of the plant and to determine the most suitable genotypes with respect to growing conditions in northern Europe. The location of Braunschweig can be considered as one of the most extreme northern latitudes (52° 17' 35" north). The main objectives are to evaluate the performance of sweet sorghum and its potential yield under such climatic conditions at higher latitudes.

3. Objectives

The objectives of the contribution from the Institute of Crop Science of the Federal Agricultural Research Centre (FAL) as an associated proposer (07) were defined within the activities of the actions of the coordinator (01) and focused on the following topics:

Action A 1: Assist in improvement of the potential and actual productivity model by common experiments focused on actual data.

Action A 2: Improvement on optimisation of the advantages of sweet sorghum, mainly optimisation of the input nitrogen.

Action A 3: Adaptation to low temperature which limits productivity and geographical extension.

Action B 2: Constitution and improvement of potential and actual productivity by database exploitation.

The specific objectives can be summarised as follows:

- Determination of aerial dry matter evolution and distribution in different organs during the whole crop cycle - under optimal and non-limiting nitrogen and weather supply conditions.

- Relationship between dry matter and the rate of intercepted radiation.

- Determination of sugar accumulation in different growth stages and partitioning in aerial organs: stems, leaves and panicles.

- To supply information in order to verify the productivity model in optimum conditions which relates the aerial biomass to the quantity of interrupted PAR (Photosynthetic Active Radiation) in the given climatic region.

- To test different genotypes to evaluate their aptitude to produce total biomass, sugar and ethanol at this latitude and to increase the genetic variation.

4. Materials and Methods

The research activities included the following topics:

Physical Measurements
Genotype Screening
Productivity Trials and Physiological Measurements
Database Collection

4.1 Physical Measurements

The Institute of Crop Science in Braunschweig - Völkenrode is located at:

Latitude (degrees, minutes, seconds):	52° 17' 35" north
Longitude (degrees, minutes, seconds):	10° 26' 55" east
Altitude:	81 meters
Situation of experimental fields:	approximately 200 km south of the North Sea and Baltic Sea (fig. 1).

4.1.1 Soil physical analysis

These investigations concentrated on the determination of the soil type of the experimental fields and the grain size of soil, i.e. fractions of sand, silt and clay.

The field trials were situated in Braunschweig - Völkenrode. The soil is a loamy sand with low organic matter content. The location is by nature of a moderate soil fertility. The topsoil is nearly neutral (pH = 6.5), the subsoil is weakly acidic. The C/N ratio is approximately 10. The depth of the ground water ranges between 7 - 10 m. Tables 1-4 summarise many of the soil's characteristics.

Figure 1. Location of the Field Trials (Braunschweig, Germany).

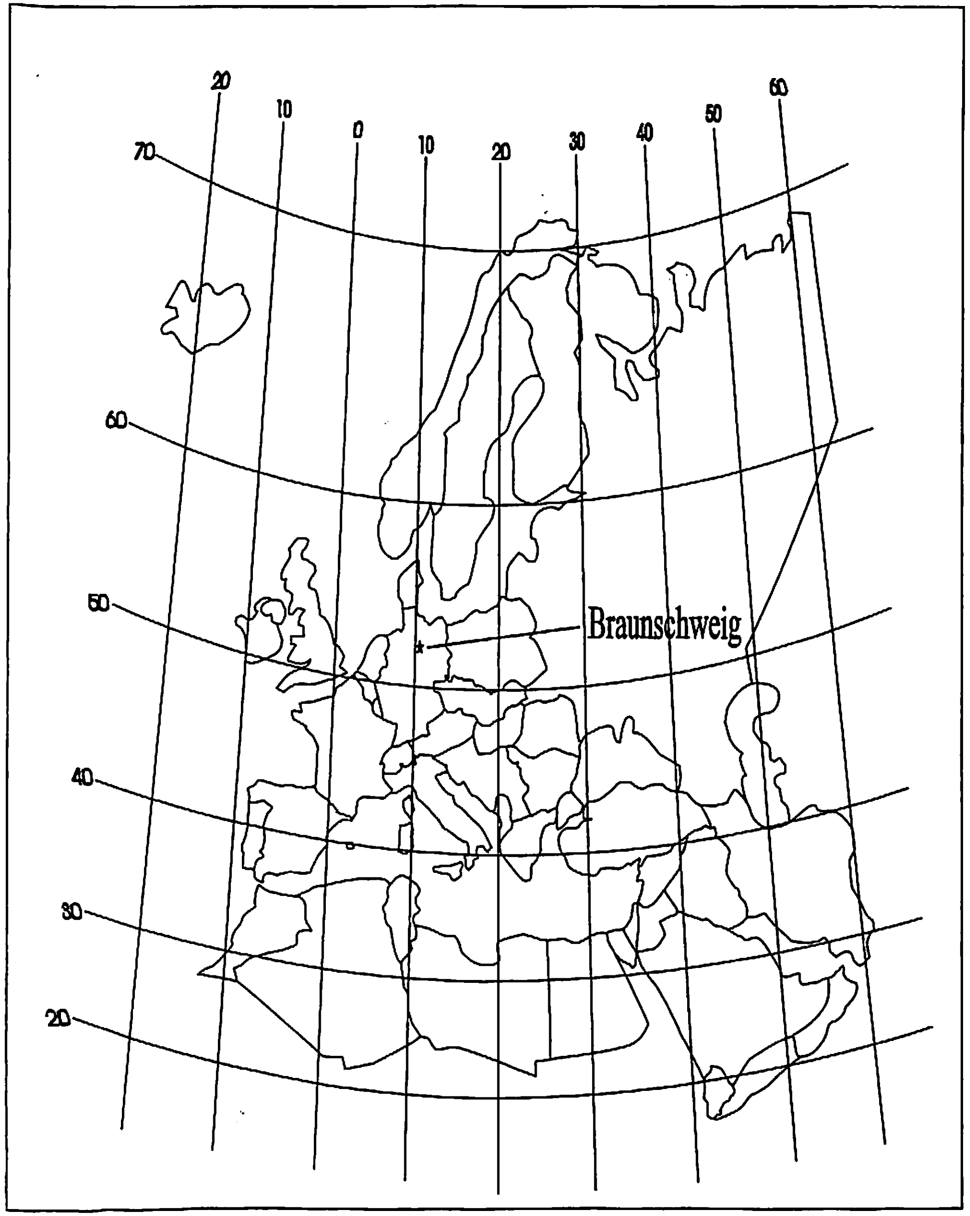


Table 1. Soil characteristics based on soil horizon levels.

Horizon	Depth (cm)	Soil	Sand (%)	Silt (%)	Clay (%)	Porosity (%)
Ap	0 - 23	uS				
Ah	24 - 30					
Ap/Ah	0 - 30		63.9	30.3	5.8	43.8
Bv	30 - 60	uS - S	64.7	29.4	5.9	37.8
Cv_I	60 - 90	S				40.3

Table 2. Summary based on soil horizon levels.

Soil albedo	$\alpha_{PAR} = 0.15$
Depth	0.95 m
Porosity	42.04 %
Sand	64.3 %
Silt	29.9 %
Clay	5.8 %

Table 3. Grain-size distribution.

Depth (cm)	Sand (%)	Silt (%)	Clay (%)	Soil type
0 - 25	34	57	9	sandy loam
25 - 50	33	55	12	sandy loam
50 - 60	64	28	8	loamy sand
60 - 80	75	14	11	loamy sand

Table 4. Additional characteristics based on soil depth level.

Depth (cm)	Moist bulk density (g/cm^3)	Lower limit of plant extractable water (vol. %)	Water content at saturation (vol. %)
0 - 10	1.57	6.18	24.83
10 - 20	1.46	5.58	23.79
20 - 30	1.50	5.46	23.98
30 - 40	1.60	4.63	26.23
40 - 50	1.53	4.42	25.33
50 - 60	1.71	3.11	14.01

The initial water content in sowing is normally equal to the water content at saturation.

4.1.2 Meteorological data collection

The data measurements at the experimental site included the following parameters: Air temperature at 2 m height, lowest temperature at soil's surface, sunshine duration, global solar radiation, precipitation, evaporation and water balance. The meteorological data from each month (1985 - 1995) are listed in annex 1. Some weather data means are shown in table 5.

Table 5. Selected meteorological data at the Braunschweig site.

Year	Air temp. mean (°C)	Soil temp. abs.min. (°C)	Solar radiation total (J/cm^2)	Hot days (> 30°C) (No.)	Heat total (°C)	Cold total (°C)	Precipi-tation total (mm/y)	Evapo-ration total (mm/y)
1990	10.5	-9.7	374289	5	3802.4	14.7	615	650
1991	9.0	-20.0	377772	3	3435.0	115.3	470	603
1992	10.2	-10.6	375512	10	3757.4	58.8	611	721
1993	8.8	-17.9	357789	0	3367.5	142.6	686	568
1994	10.2	-18.8	377577	17	3806.4	70.3	752	659
1995	9.5	-17.6	379642	14	3610.9	126.0	621	637
61-90	8.9		351290	3.5	3399.3	154.6	619	541

Additional long-term climatological data (1951 - 1980):

Mean annual air temp.:	8.8°C
Atmospheric humidity:	79%
Wind, main direction:	southwest
Wind force:	3 - 4 km/h
Summer days (> 25°C):	24 d/y
Precipitation > 0.1 mm:	187 d/y
Precipitation > 1 mm:	116 d/y
Precipitation: > 10 mm:	14 d/y
Snow covering:	34 d/y

Differences between highest and lowest monthly mean air temperature (°C)

JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
4.8	5.6	6.8	8.7	9.7	9.6	9.4	9.8	8.5	7.2	5.1	4.5

Special features of the weather from 1990 to 1995 are described as follows:

1990

The vegetation period for 1990 was, as a whole, too dry, especially in May, July and August. At the end of April/beginning of May a first dry period was recorded. In the first two weeks of June there was considerable precipitation followed by a relative cold summer period to the middle of July. Thus, the evaporation was low and water requirement of plants not so high. After this period about the next 6 weeks were without rainfall. Starting with the beginning of September the weather changed completely. Continuous rainfall led to sufficient water supply for the plants.

1991

The vegetation period for 1991 began with a dry and warm spring. In addition, May, July and August were too dry, May and June too cold compared to the means. Only at the end of September did sufficient rainfall lead to a positive water balance.

1992

The vegetation period for 1992 was excessively dry and warm, except September. Spring was characterised by warm and humid weather. Up until the first week of May precipitation was sufficient. The time following dry periods of several weeks led, in combination with high evaporation, to a high water deficiency, especially at the end of May, middle of June and beginning of August. In the second week of August continuous periods of rain ended the dry stretch, interrupted only by a short dry period at the end of September.

1993

The vegetation period for 1993 was too wet after the 5 dry summers of the previous years. Only March and the end of April showed a precipitation deficiency. March was very dry and led to a quick drying out of the soil. Thus, vegetation started early in the spring. The first two weeks of April had sufficient rainfall. There was a warm, dry period from the end of April to the middle of May. At the end of the month frequent rainfall led to sufficient soil water reserves for providing plants with water.

1994

The vegetation period for 1994 started with a wet spring from March until the middle of April. In May and June repeated precipitation had been recorded. After the first week of July a dry period of about 6 weeks started with very high temperatures. Due to a daily evaporation rate of 5 to 6 mm, soil moisture decreased rapidly. After this very dry period there was sufficient rainfall for further plant growth.

1995

The vegetation period for 1995 was characterised by a cold and wet spring followed by very dry summer weather. Precipitation in March was about 25 mm over the long term rain total, whereas the months from April to August showed a rain deficit in combination with very high temperatures when compared to those means from 1960 to 1990. At the end of August and September there was enough rain for filling the soil water reserve.

4.2 Genotype Screening

From different regions of the world numerous genotypes were investigated under field conditions to further identify cultivars which might be used in the future and also to evaluate new developed hybrids by different institutions. The major aspects investigated were cold tolerance, total biomass and sugar content. These genotypes originated from Germany, India, Hungary and Australia (see annex 2).

The genotypes were sown in the beginning of June each year. The distance between the rows was 0.70 m, the distance between the plants within the row was 0.10 m and the plot size was 1.50 m x 6.00 m = 9.00 m². Each genotype was sown in 4 replications.

120 kg nitrogen was given to the plots after emergence. Phosphorus and potassium were applied before sowing according to the results of soil analysis (120 kg P_2O_5 and 240 kg K_2O per ha, respectively). Weed control was done by hand and by machine twice after emergence.

In some cases there were two harvest dates for investigation of change of different yield parameters during the ripening period of the sweet sorghum genotypes. The first harvest was carried out at the end of September followed by the second harvest towards the end of October.

For the genotype screening the topics included were: Fresh matter yield, dry matter yield, total sugar content, sugar yield, glucose content, fructose content, saccharose content, raw fibre content, dry matter content, growth height, panicle emergence time, vigour, cold susceptibility of young plants, wind influence upon young leaves, tillering, amount of disease on leaves, drought susceptibility, lodging tendency, and harvest date.

4.3 Productivity Trials

The productivity trials were discussed and designed by the productivity group in previous sessions held for this purpose. The aim was to determine the growth development during the whole vegetation period of 1 or 2 selected genotypes which might be most suitable for the given region. Also an agreement was achieved to carry out measurements on aerial biomass, leaf area index and sugar accumulation. These data were used to establish the productivity model by the main contractors.

4.3.1 Species and cultivar

For these studies 2 genotypes were chosen. The genotype 'Keller' was chosen first as a common genotype for all participants and the genotype 'Korall' was recommended for the northern part of Europe.

species: *Sorghum bicolor*
cultivar: Keller
type: hybrid
source: Kleinwanzlebener Saatzucht, Einbeck Germany

species: *Sorghum bicolor*
cultivar: Korall
type: hybrid
source: Kleinwanzlebener Saatzucht, Einbeck Germany

4.3.2 Nitrogen treatments

Three levels were applied:

low level (N_1)	=	50	kg N/ha
medium level (N_2)	=	150	kg N/ha
high level (N_3)	=	200	kg N/ha

The N_2 and N_3 levels were split into 2 and 3 applications, respectively. The higher level (N_3) could be considered as non-limiting. Potassium (K_2O as potassium magnesia) was applied at 240 kg/ha and Phosphorus (P_2O_5 as triple-superphospate) was applied at 180 kg/ha.

4.3.3 Experimental design

The experimental design consisted of three blocks each 21.0 m x 14.0 m. The three nitrogen levels each received their own block. The size of each elementary plot was large enough to allow periodical sampling in order to estimate aerial biomass accumulation on 2 m^2 areas. Fungicides and insecticides were not applied and were also not necessary.

4.3.4 Biological measurements

Approximately 5 weeks after emergence periodical harvesting was performed to determine the fresh matter and dry matter biomass contents. From these data, aerial dry matter, proportion of leaves, stems, leaf specific weight, leaf area and leaf area index (LAI), as well as plant height, were determined.

4.3.5 Chemical analysis

All samples from the different nitrogen treatments were prepared for sugar content determination by means of HPLC.

Once the samples were thawed in the refrigerating room at 2°C, they were homogenised in a small grinding mill. 10 g of this material was then weighed into a 250 ml graduated flask, and approximately 200 ml of double distilled water was added (double determination). This suspension was boiled for 20 minutes, after which time the cells were completely digested. After the solution was allowed to cool, the flasks were filled to the calibration mark with double distilled water; then a pleated filter was used to remove cell fragments and fibre components from the samples. Finally, using a throw-away filter holder (pore size 0.45µm) the samples were ready for High Performance Liquid Chromatography (HPLC).

Specification of the HPLC conditions:

Flow rate:	0.3 ml/min
Mobile phase:	Double distilled water
Columns:	Polypore CA (manufactured by Kontron), main column 22 cm and guard column 3 cm Column diameter 4.6 mm
Temperature:	80°C ± 0.2°C
Detection:	RI
Evaluation:	External standard, 2-point calibration

Sweet sorghums sugar fractions are: Saccharose, Glucose and Fructose.

Soil samples from the field trials were analysed for the major nutrient components: Nitrogen, Potassium and Phosphorus.

4.4 Database Collection

The Institute of Crop Science, FAL, has prepared a database for all genotypes, cultivars and hybrids investigated in the last 10 years (1985 - 1995). This amounts to 1350 forms of sorghum which have been examined in field trials for their suitability for cultivation and their quality features. The entire evaluation data are well documented and attached as annex 3. The following parameters were included in the evaluation programme:

Parameter No.	Item Investigated	Parameter No.	Item Investigated
1	Fresh matter yield (dt/ha)	2	Dry matter yield (dt/ha)
3	Total sugar content (%)	4	Sugar yield (dt/ha)
5	Glucose content (%)	6	Fructose content (%)
7	Saccharose content (%)	8	Raw fibre content (%)
9	Dry matter content (%) mean	10	Growth height (cm)
11	Panicle emergence time	12	Vigour
13	Cold susceptibility young plant	14	Wind influence upon young leaf
15	Tillering	16	Amount of disease on leaf
17	Drought susceptibility	18	Lodging tendency
19	Harvest date		

These data could also be supplied for all other interested institutions. This documentation represents the largest data collection concerning sweet sorghum.

5 Results

5.1 Results of Genotype Screening

5.1.1 Experimental year 1992

As of the 9th of June all genotypes had emerged. The genotypes ZH 2916 from Germany, Colman 70/9685-11 from Hungary and ICSV-91003 from India showed a lower rate of emergence than all other genotypes.

The time from sowing to panicle emergence varied greatly between the genotypes. The date of panicle emergence was between the 12th of August and the 16th of October for the German genotypes (Tab. 6). The genotypes ZH 2910 and ZH 2927 started their panicle emergence on the 12th of August, the genotype ZH 2931 was last on the 16th of October.

Table 6. Days from sowing to panicle emergence, number of shoots and plant height of sweet sorghum genotypes.

	time from sowing to panicle emergence (d)			shoots (number)			plant height (cm)		
Origin (n)	mean	min.	max.	mean	min.	max.	mean	min.	max.
Germany (44)	89.9	69	134	3.1	1	7	198.8	105.0	279.4
India (8)	107.8	77	124	2.9	1	5	225.0	177.9	258.2
Hungary (2)	89.5	77	102	5.5	5	6	243.2	198.1	271.3
Australia (1)	110.5	109	113	3.5	3	4	270.1	266.0	276.3

The Hungarian and German genotypes needed on average 20 days less time from sowing to panicle emergence than the genotypes from India and Australia. The Hungarian genotypes showed the highest shooting capacity. The plants developed between 5 and 6 shoots per plant. The maximum number of shoots was reached by the German genotype ZH 2908 with 7 shoots/plant. The one Australian genotype (Early Orange) was distinguished by plant height between 266.0 and 276.3 cm. Although the German genotypes showed only an average plant height of 198.8 cm, the maximum from all genotypes was reached by the German genotype ZH 2914 (279.4 cm).

The Australian genotype (Early Orange) produced 101.43 t fresh matter per ha (Tab. 7). It was the highest FM-yield compared to all other genotypes. This Australian genotype reached on average 87.32 t/ha, followed by the Indian genotypes with 60.28 t/ha FM-yield. The German genotypes produced the lowest FM-yield. There was the same order for the yield parameter dry matter yield.

The analysis of dry matter content showed that the Indian genotypes were characterised by very high dry matter content up to a maximum of 68.85 %. In addition, the Indian genotypes were distinguished by a high sugar content. The stems contained 7.81 % sugar (mean) with a maximum of 11.96 %. The highest sugar content was produced by the German genotypes. The sugar content ranged from 2.16 % to 12.87 % in the fresh matter. The German genotypes went one better than all other genotypes only in this yield parameter. The Australian and Hungarian genotypes reached sugar contents of 6.82 % and 6.01 %, respectively.

According to the highest FM-yield, the Australian genotype reached the highest mean sugar yield with 6.12 t/ha, followed by the Indian genotypes with 4.67 t/ha. Because of their low sugar content the Hungarian genotypes had the lowest mean sugar yield of 3.59 t/ha. The sugar yield of all genotypes ranged from 1.14 to 8.68 t/ha. In the vegetation period 1992 the maximum sugar yield was produced by the German genotype 2913 (8.68 t/ha).

Table 7. Yield parameters of the sweet sorghum genotypes.

			Germany	India	Hungary	Australia
FM-yield	t/ha	mean	48.52	60.28	54.36	87.32
		min.	29.31	50.18	33.10	73.22
		max.	77.40	87.89	79.00	101.43
DM-yield	t/ha	mean	18.52	28.68	22.40	36.34
		min.	8.92	16.03	14.12	30.89
		max.	29.92	51.35	32.57	41.80
DM substance	%	mean	38.67	47.69	43.65	43.77
		min.	19.16	32.74	28.96	30.45
		max.	60.35	68.85	60.56	57.09
Sugar content	%	mean	8.72	7.81	6.01	6.82
		min.	2.16	3.29	3.30	5.61
		max.	12.87	11.96	8.60	8.03
Sugar yield	t/ha	mean	4.29	4.67	3.59	6.13
		min.	1.14	1.67	1.09	4.11
		max.	8.68	7.39	6.80	8.14

Like other crops with tropical origin, sweet sorghum started its growth late in the spring because it needs higher soil and air temperature for sprouting. According to maize growth there is a yield increase up to the first frost in autumn. For defining the optimal harvest date it is worth while to observe how the yield parameters change during the ripening period of sweet sorghum.

Figure 2 shows the frequency of FM-yield in different yield classes over all genotypes. In harvest I most genotypes reached FM-yields between 50 and 60 t/ha. In addition figure 2 shows that the yield class with the greatest frequency moved from 50-60 t/ha in harvest I to 40-50 t/ha in harvest II. The fresh matter yield decreased as a whole from 52.69 to 46.92 t/ha on average.

On the other hand dry matter yield showed the contrary tendency (Fig. 3). It increased with longer ripening time. In harvest I most genotypes produced a dry matter yield between 15 and 20 t/ha. The dry matter yield class with the greatest frequency increased to 25-30 t/ha in harvest II.

Figure 2. Frequency of fresh matter yield of all genotypes at two different harvest dates, 1992.

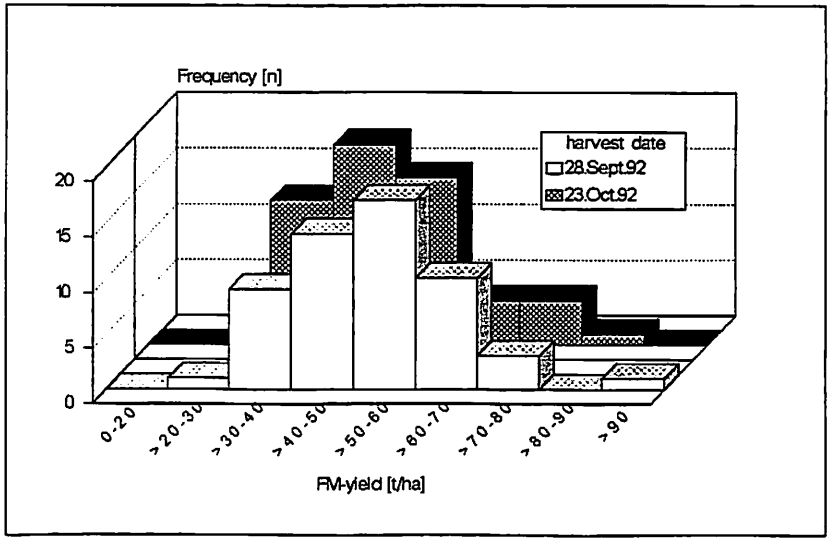


Figure 3. Frequency of dry matter yield of all genotypes at two different harvest dates, 1992.

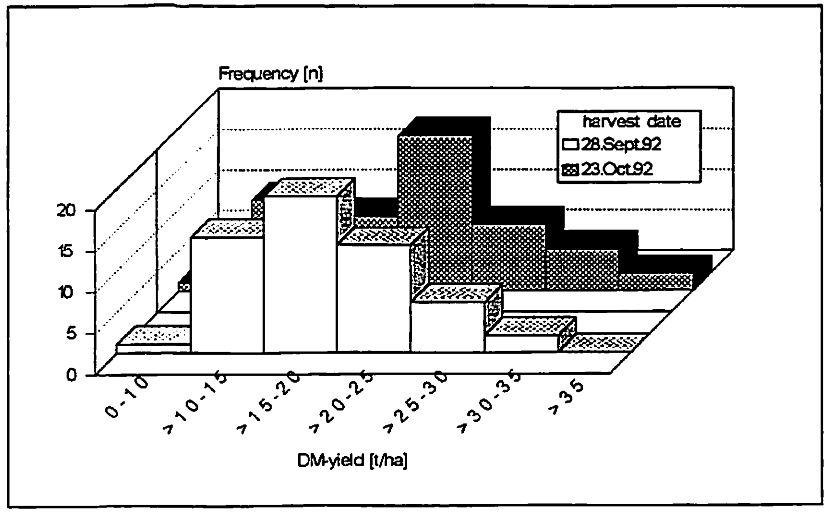


Figure 4. Frequency of stem sugar content of all genotypes at two different harvest dates, 1992.

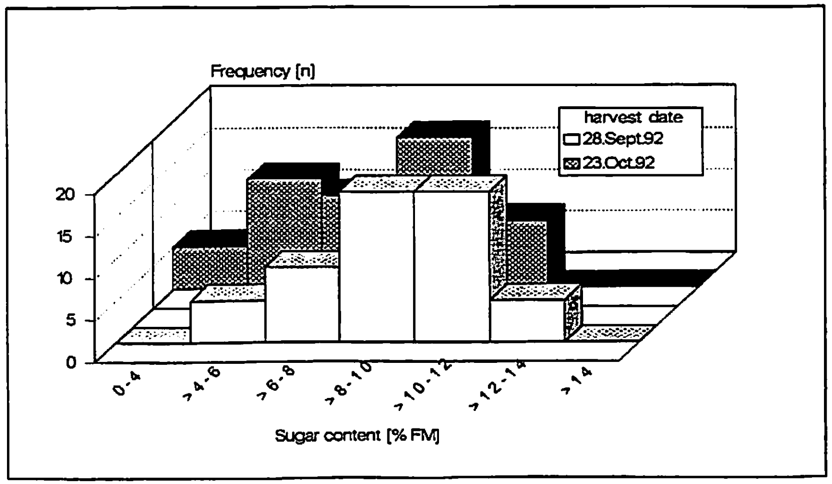
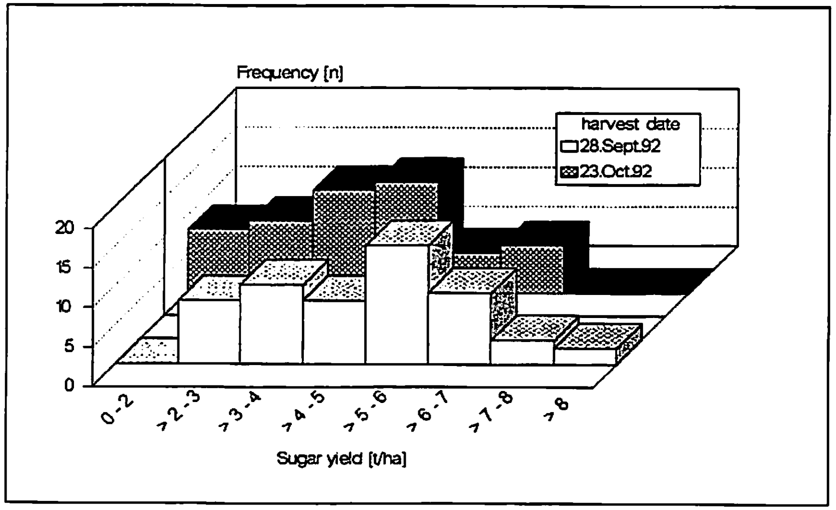


Figure 4 shows that the dominant stem sugar content frequency classes in harvest I were between 4 and 14%. In harvest II sugar content decreased and the dominant frequency classes changed to those between 0 and 12%. The mean sugar content decreased from 9.44 % in harvest I to 7.46 % in harvest II.

The parameter, sugar yield, consisting of fresh matter yield and sugar content followed the main tendency and decreased from harvest I to harvest II (Fig. 5). The mean sugar yield of all genotypes decreased from 4.97 t/ha to 3.74 t/ha. In harvest I most genotypes produced sugar yields between 5 and 6 t/ha. In harvest II the greatest frequency was reached with the yield class 4-5 t/ha

Figure 5. Frequency of sugar yield of all genotypes at two different harvest dates, 1992.



5.1.2 Experimental Year 1993

In 1993 the genotypes produced a lower fresh matter yield compared to 1992 (Fig. 6). The plants also did not reach the plant height from 1992 (Tab. 8). Nonetheless these plants produced more stem biomass than in 1992. The mean of the two years FM-yield was 46.15 t/ha (Tab. 8).

Total sugar content in the FM ranged from 3.06 to 9.74 % in 1992. The mean sugar content of 92/93 was 8.27 %. Remarkable is the low saccharose content of 4.71 % produced in 1993 compared to that of 1992 (7.30 %).

The sugar yield produced in 1993 was about 1.5 t/ha lower compared to 1992, resulting from the lower FM-yield in combination with the low sugar content. The mean of 92/93 was 3.96 t/ha.

Figure 6. Fresh matter yield of sweet sorghum genotypes, 1992, 1993 and mean.

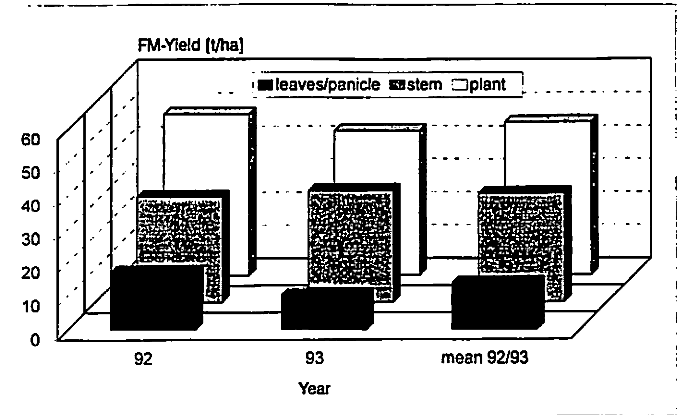


Table 8. Yield parameters of 33 sweet sorghum genotypes.

		92			93			92/93
		mean	min.	max.	mean	min.	max.	mean
FM-yield	t/ha	48.68	29.31	77.40	43.62	18.44	70.70	46.15
FM stem	t/ha	31.62	15.72	56.91	33.31	10.96	61.25	32.46
DM-yield	t/ha	15.22	9.36	22.97	13.18	6.04	20.61	14.20
DM stem	t/ha	9.07	4.44	15.53	8.34	1.92	15.48	7.80
DM content	%	31.48	27.89	36.47	30.48	25.74	35.17	30.98
DMC stem	%	28.77	25.02	33.76	25.06	17.53	28.82	26.92
sugar	%	9.61	5.04	12.87	6.94	3.06	9.74	8.27
fructose	%	1.07	0.65	1.59	1.29	0.62	2.29	1.18
glucose	%	1.24	0.52	1.85	0.94	0.52	1.71	1.09
saccharose	%	7.30	3.37	9.75	4.71	1.01	7.90	6.01
plant height	cm	184.70	111.00	267.00	167.73	84.00	250.00	176.21
sugar yield	t/ha	4.73	2.25	8.68	3.20	0.94	6.82	3.96

5.2 Distribution Frequencies for 1992 - 1995

Calculations were conducted to determine the distribution frequency of the sorghum genotypes which were cultivated in the 4 year period between 1992 and 1995. These results are displayed based on the year in figures 7 to 10.

1992

Figure 7 shows the distribution frequency of fresh matter yield in tons per hectare for 114 genotypes cultivated in the year 1992. The dominant frequency class was 40-60 t/ha of fresh matter which contained 45.6 % of the distribution or 52 genotypes. The next dominant class was 20-40 t/ha which contained 29.8 % of the distribution or 34 genotypes. Along with the 60-80 t/ha class which held 22.8 % or 26 genotypes, the three classes amounted to 98.2 % of the total distribution or 112 genotypes. The remaining 1.8 % was made up of the 0-20 t/ha and the > 100 t/ha classes which each had 0.9 % or 1 genotype. No genotypes had a fresh matter yield between 80-100 t/ha.

Figure 8 shows the distribution frequency of dry matter yield in tons per hectare for 111 sorghum genotypes cultivated in the year 1992. The dominate frequency class was 12-16 t/ha of dry matter which contained 35.1 % of the distribution or 39 genotypes. The next dominant class was 16-20 t/ha with 31.5 % or 35 genotypes. Along with the 8-12 t/ha class which held 22.5 % or 25 genotypes, the three classes amounted to 89.1 % of the total distribution or 99 genotypes. The remaining 10.9 % was made up of the 0-4 t/ha class which had 0.9 % or 1 genotype, the 4-8 t/ha class which had 1.8 % or 2 genotypes, the 20-24 t/ha class which had 7.2 % or 8 genotypes and the > 24 t/ha class which had 0.9 % or 1 genotype.

Figure 9 shows the distribution frequency of total sugar content for 113 sorghum genotypes cultivated in the year 1992. Because they were both of virtually equal frequency, the dominant frequency classes were 4-6 % and 6-8% total sugar content which contained 26.5 % and 25.7 % or 30 and 29 genotypes respectively. The next dominant class was 8-10 % which had 17.7 % or 20 genotypes, followed by the 10-12 % class which had 15.9 % or 18 genotypes. These four classes made up 85.8 % of the genotype distribution or 97 genotypes. The remaining 14.2 % was made up of the 0-2 % class which had 3.5 % or 4 genotypes, the 2-4 % class which had 6.2% or 7 genotypes, and the > 12 % class which had 4.4 % or 5 genotypes.

Figure 10 shows the distribution frequency of sugar yield in tons per hectare for 1124 sorghum genotypes cultivated in the year 1992. The dominant frequency class was 2-4 t/ha of sugar which contained 46 % of the distribution or 52 genotypes. The other classes consisted of 0-2 t/ha which contained 17.7 % of the distribution or 20 genotypes, the 4-6 t/ha class which had 23.9 % or 27 genotypes, the 6-8 t/ha class which had 10.6 % or 12 genotypes and the > 8 class which had 1.8 % or 2 genotypes.

Figure 7. Distribution frequency of fresh matter yield from sorghum genotypes (1992).

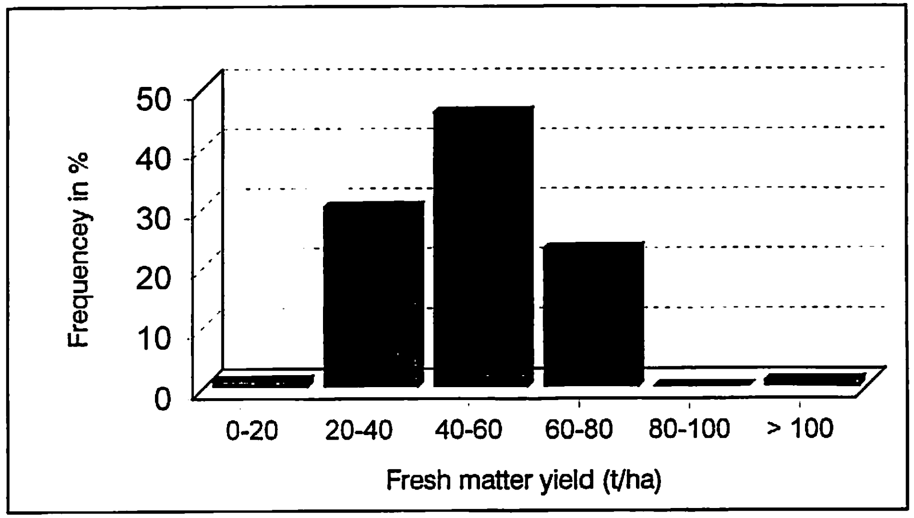


Figure 8. Distribution frequency of dry matter yield from sorghum genotypes (1992).

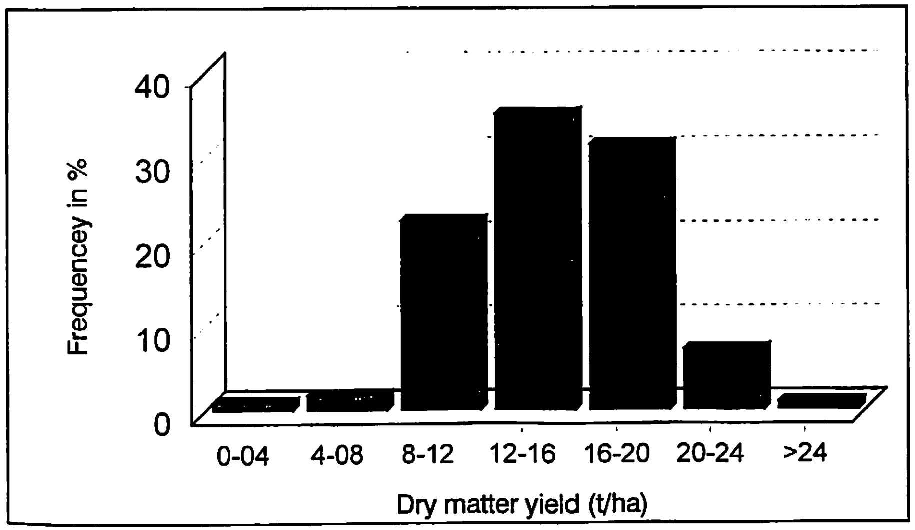


Figure 9. Distribution frequency of total sugar content from sorghum genotypes (1992).

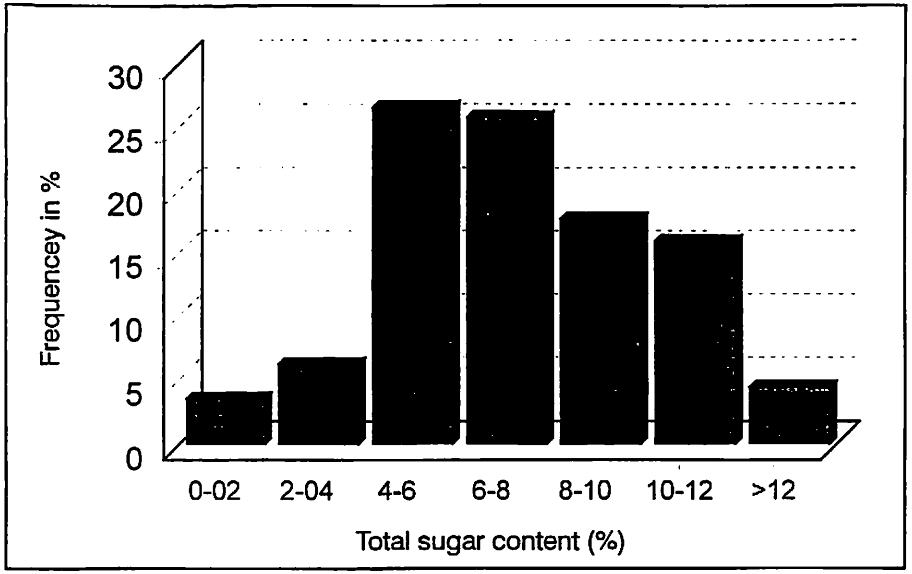
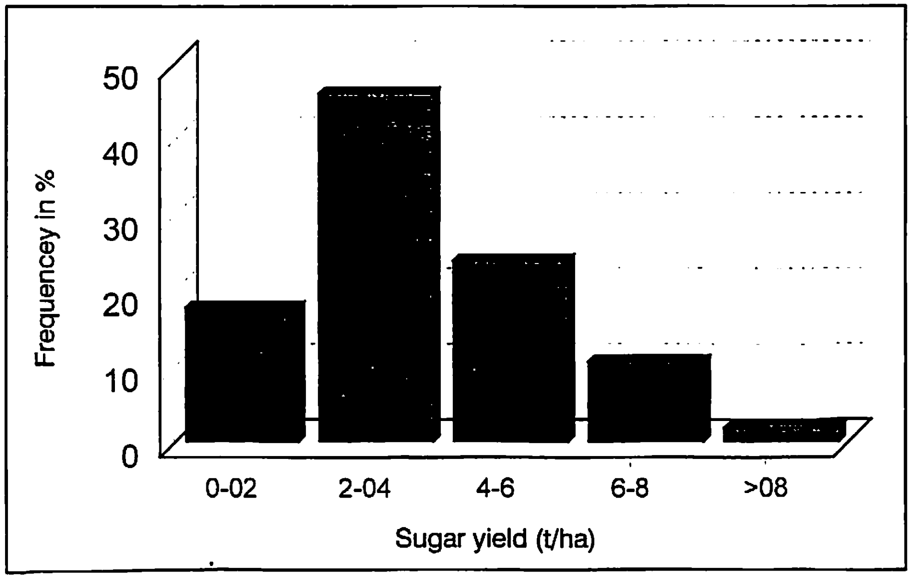


Figure 10. Distribution frequency of sugar yield from sorghum genotypes (1992).



1993

Figure 11 shows the distribution frequency of fresh matter yield in tons per hectare for 100 genotypes cultivated in the year 1993. The dominant frequency class was 20-40 t/ha of fresh matter which contained 46 % of the distribution or 46 genotypes. The next dominant class was 40-60 t/ha which contained 27 % of the distribution or 27 genotypes. Along with the 60-80 t/ha class which held 16 % or 16 genotypes, the three classes amounted to 89 % of the total distribution or 89 genotypes. The remaining 11 % was made up of the 0-20 t/ha and the > 80 classes which had 7 % and 4 % or 7 and 8 genotypes respectively.

Figure 12 shows the distribution frequency of dry matter yield in tons per hectare for 100 sorghum genotypes cultivated in the year 1993. The dominate frequency class was 8-12 t/ha of dry matter which contained 33 % of the distribution or 33 genotypes. The distribution of the 4-8 t/ha, the 12-16 t/ha and the 16-20 t/ha classes was almost equal, with 21 % or 21 genotypes for the 4-8 t/ha class, 20 % or 20 genotypes for the 12-16 t/ha class and 19 % or 19 genotypes for the 16-20 t/ha class. These four classes amounted to 93 % of the total distribution or 93 genotypes. The remaining 7 % was made up of the 0-4 t/ha class which had 1 % or 1 genotype and the > 20 t/ha class which had 6 % or 6 genotypes.

Figure 13 shows the distribution frequency of total sugar content for 100 sorghum genotypes cultivated in the year 1993. The most dominant frequency class was the 2-4 % total sugar content, having 37 % or 37 genotypes. Because they were all of virtually equal frequency the next dominant frequency classes were 2-4 % which contained 18 % or 18 genotypes and the 4-6 %, 6-8 % and > 8 % classes, which had 15 % or 15 genotypes each.

Figure 14 shows the distribution frequency of sugar yield in tons per hectare for 100 sorghum genotypes cultivated in the year 1993. The dominant frequency class was 0-2 t/ha of sugar, which contained 62 % of the distribution or 62 genotypes. The other classes consisted of 2-4 t/ha which contained 27 % of the distribution or 27 genotypes, the 4-6 t/ha class which had 9 % or 9 genotypes and the > 6 class which had 2 % or 2 genotypes.

Figure 11. Distribution frequency of fresh matter yield from sorghum genotypes (1993).

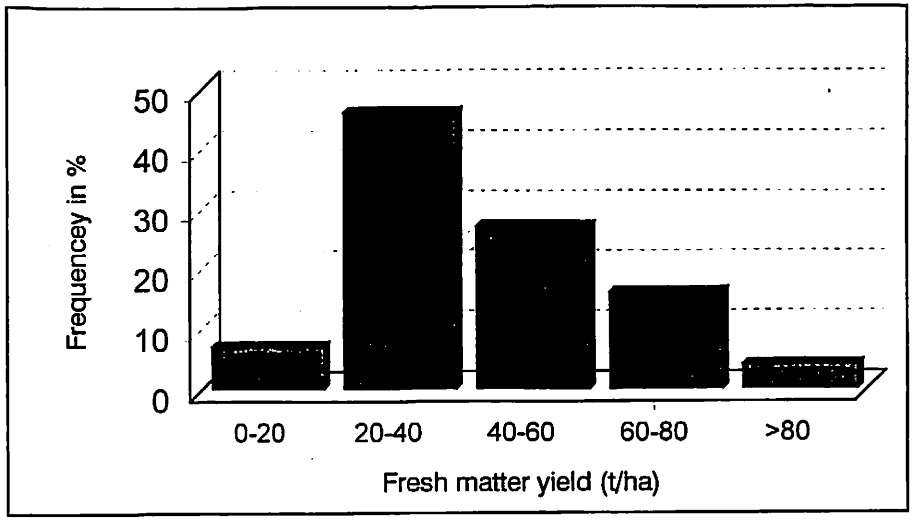


Figure 12. Distribution frequency of dry matter yield from sorghum genotypes (1993).

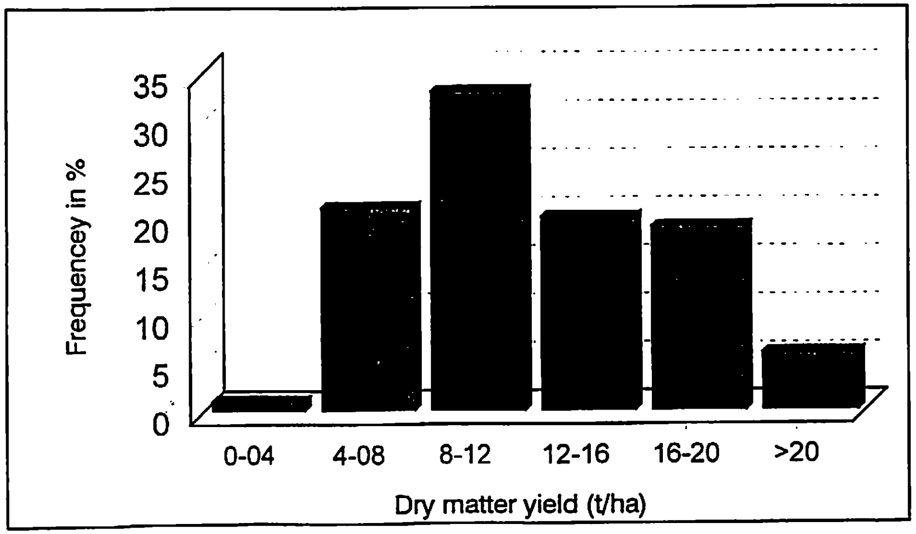


Figure 13. Distribution frequency of total sugar content from sorghum genotypes (1993).

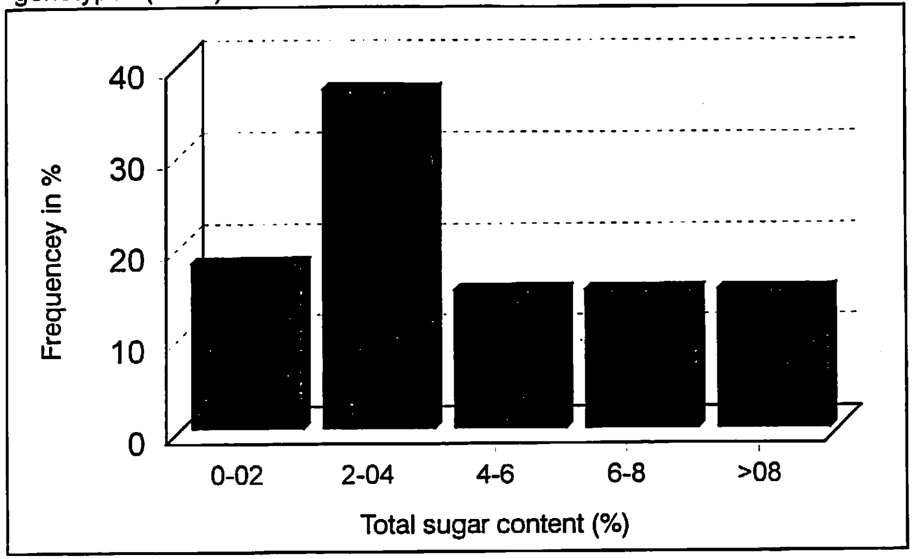
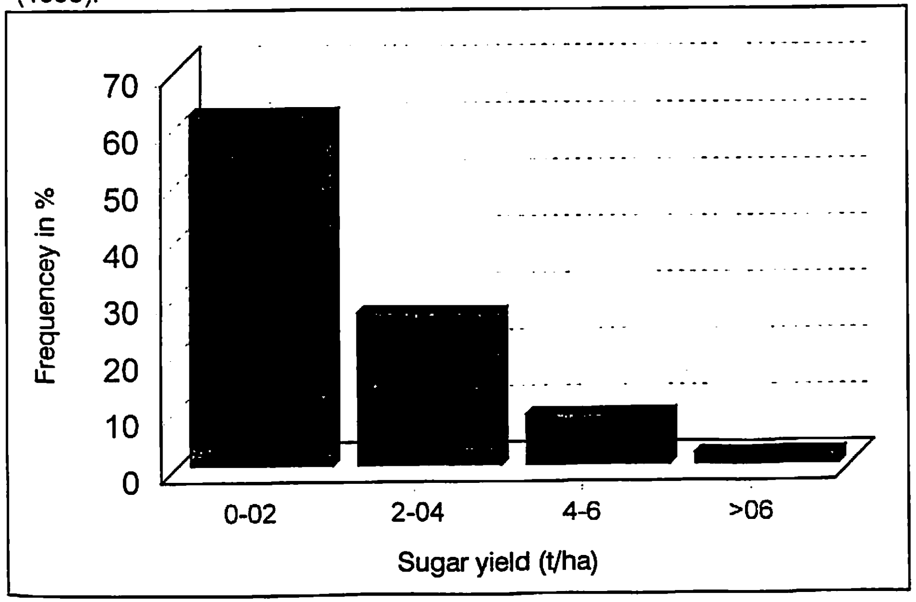


Figure 14. Distribution frequency of sugar yield from sorghum genotypes (1993).



1994

The distribution of fresh matter yield and dry matter yield in 1994 and 1995 were greatly influenced by the cultivation of fibre sorghum genotypes which were high yielding, especially with respect to dry matter yields. Figure 15 shows the distribution frequency of fresh matter yield in tons per hectare for 35 genotypes cultivated in the year 1994. The dominant frequency class was 60-80 t/ha of fresh matter which contained 40.0 % of the distribution or 14 genotypes. The next dominant class was > 100 t/ha which contained 22.9 % of the distribution or 8 genotypes. Along with the 20-40 t/ha class which held 14.3 % or 5 genotypes and the 40-60 t/ha class which held 17.1 % or 6 genotypes, the four classes amounted to 94.3 % of the total distribution or 33 genotypes. The remaining 5.7 % was made up of the 0-20 t/ha and the 80-100 t/ha classes which had 2.85 % or 1 genotype each.

Figure 16 shows the distribution frequency of dry matter yield in tons per hectare for 35 sorghum genotypes cultivated in the year 1994. The dominate frequency class was 16-20 t/ha of dry matter, which contained 25.7 % of the distribution or 9 genotypes. The next dominant class was 24 - 28 t/ha with 17.1 % or 6 genotypes, followed by the > 32 t/ha class with 14.3 % or 5 genotypes, the 20-24 t/ha class with 11.4 % or 4 genotypes, the 8-12 t/ha, 12-16 t/ha and 28-32 t/ha classes which each had 8.6 % or 3 genotypes and the 4-8 t/ha class with had 5.7 % or 2 genotypes. There were no genotypes with yields in the 0-4 t/ha class.

Figure 17 shows the distribution frequency of total sugar content for 32 sorghum genotypes cultivated in the year 1994. The most dominant frequency class was shared by the 4-6 % and 6-8 % total sugar content classes, having 34.4 % or 11 genotypes each. The two classes amounted to 68.8 % of the total distribution, or 22 genotypes. The remaining 31.2 % was made up of the 8-10 % distribution class with 15.6 % or 5 genotypes, the 2-4 % class with 9.4 % or 3 genotypes and the > 10 % class with 6.3 % or 2 genotypes. There were no genotypes with total sugar contents in the 0-2 % class.

Figure 18 shows the distribution frequency of sugar yield in tons per hectare for 32 sorghum genotypes cultivated in the year 1994. The dominant frequency class was 4-6 t/ha of sugar, which contained 46.9 % of the distribution or 15 genotypes. The next dominant class was 2-4 t/ha which had 31.3 % or 10 genotypes. Together these two class made up 78.2 % or 25 genotypes. The remaining 21.8 % consisted of the 6-8 t/ha class which contained 12.5 % of the distribution or 4 genotypes, the 0-2 t/ha class which had 6.3 % or 2 genotypes and the > 8 class which had 3.2 % or 1 genotype.

Figure 15. Distribution frequency of fresh matter yield from sorghum genotypes (1994).

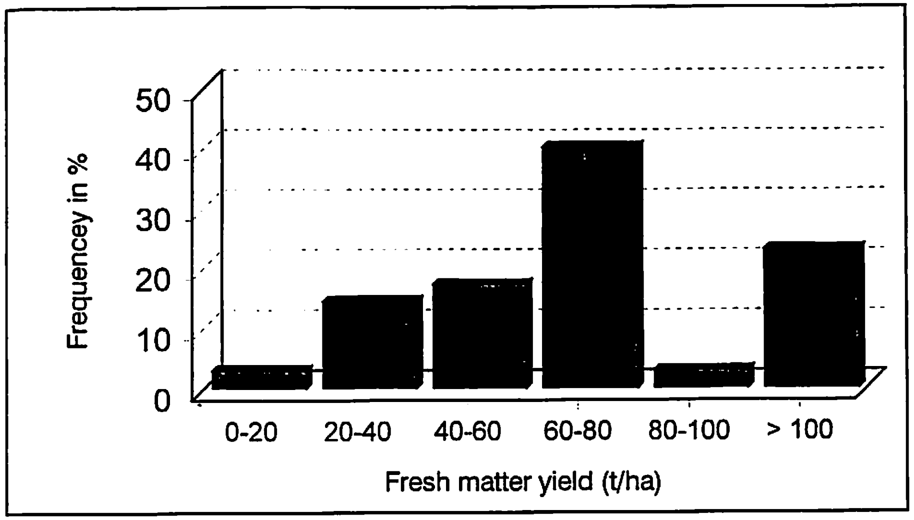


Figure 16. Distribution frequency of dry matter yield from sorghum genotypes (1994).

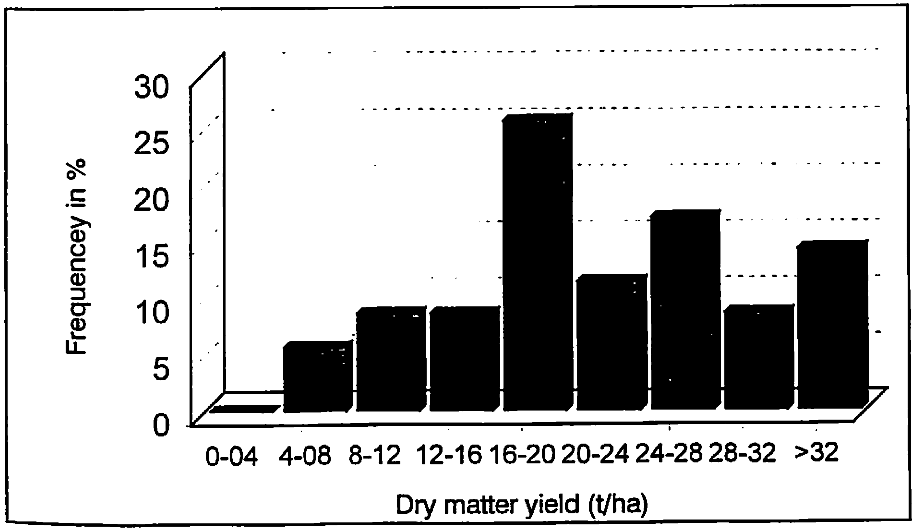


Figure 17. Distribution frequency of total sugar content from sorghum genotypes (1994).

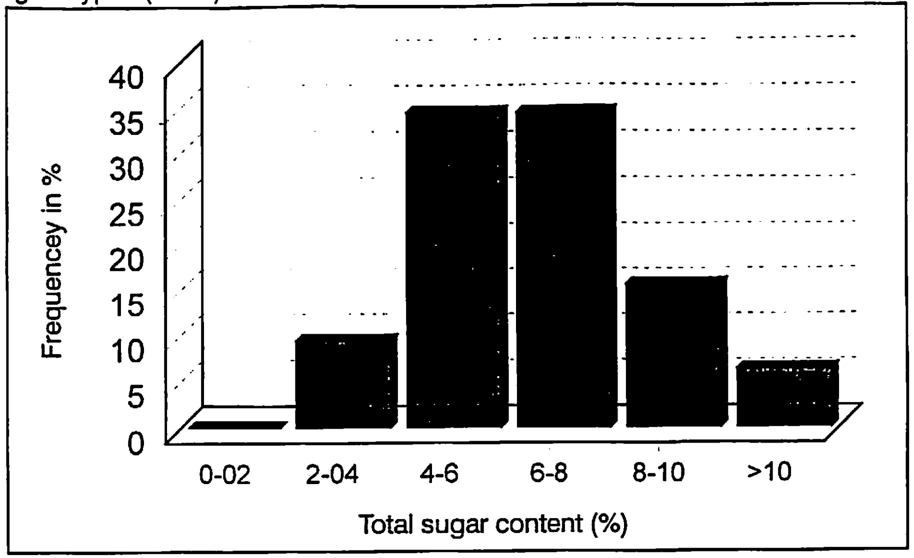
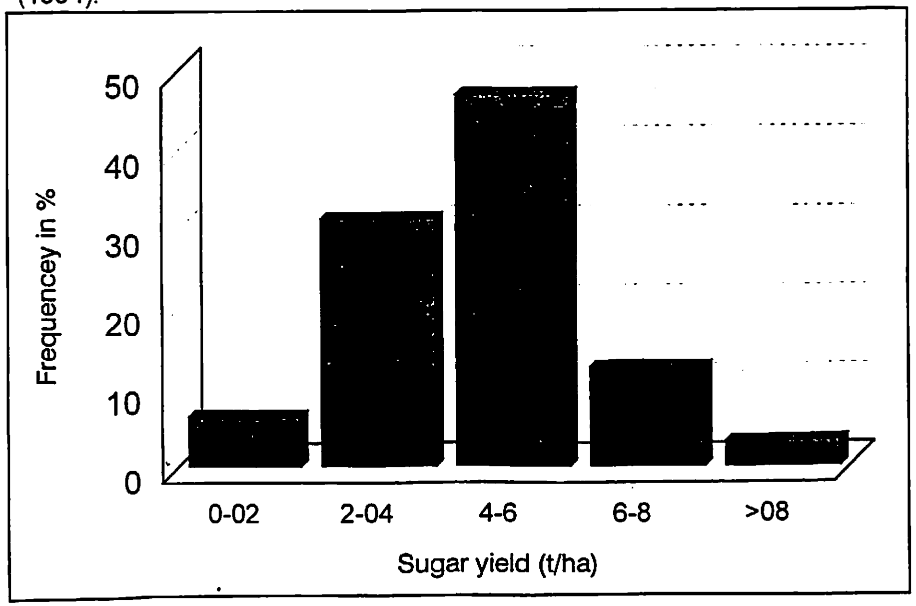


Figure 18. Distribution frequency of sugar yield from sorghum genotypes (1994).



1995

Figure 19 shows the distribution frequency of fresh matter yield in tons per hectare for 42 genotypes cultivated in the year 1995. The dominant frequency class was 40-60 t/ha of fresh matter which contained 38.1 % of the distribution or 16 genotypes. As the distribution classes (t/ha) increased, the frequency decreased at practically a steady rate. The 60-80 t/ha class contained 31.0 % of the distribution or 16 genotypes, the 80-100 t/ha class held 19.0 % or 8 genotypes and the > 100 t/ha class had 11.9 % or 5 genotypes. No genotypes had a fresh matter yield between 0-40 t/ha.

Figure 20 shows the distribution frequency of dry matter yield in tons per hectare for 42 sorghum genotypes cultivated in the year 1995. The dominate frequency class was 12-16 t/ha of dry matter, which contained 33.3 % of the distribution or 14 genotypes. The next dominant class was 16-20 t/ha with 28.6 % or 12 genotypes. Along with the 8-12 t/ha class which held 23.8 % or 10 genotypes, the three classes amounted to 85.7 % of the total distribution or 36 genotypes. The remaining 14.3 % was made up of the 20-24 t/ha class which had 9.5 % or 4 genotypes and the > 24 t/ha class which had 4.8 % or 2 genotypes. No genotypes had a dry matter yield between 0-8 t/ha.

Figure 19. Distribution frequency of fresh matter yield from sorghum genotypes (1995).

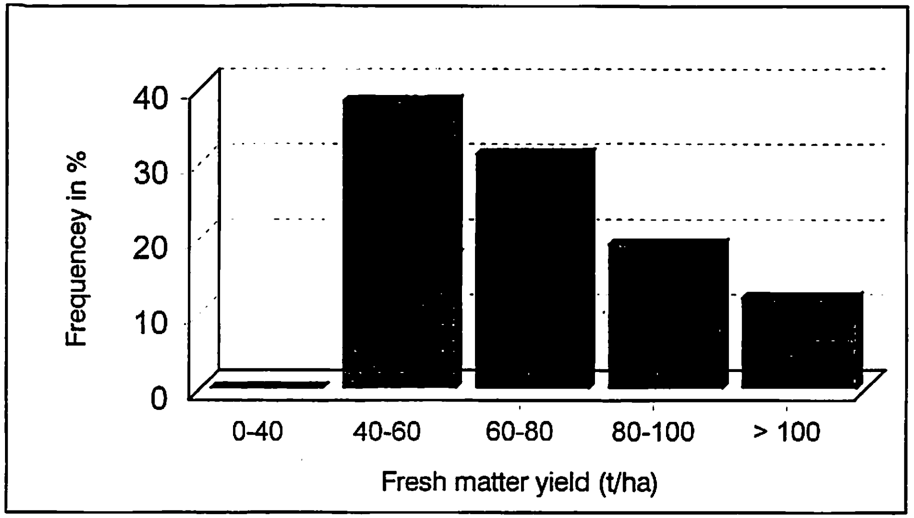
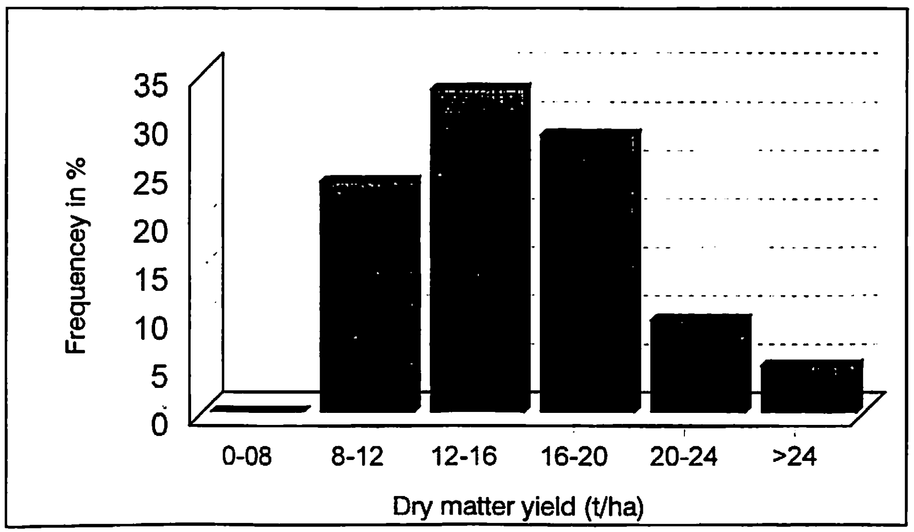


Figure 20. Distribution frequency of dry matter yield from sorghum genotypes (1995).



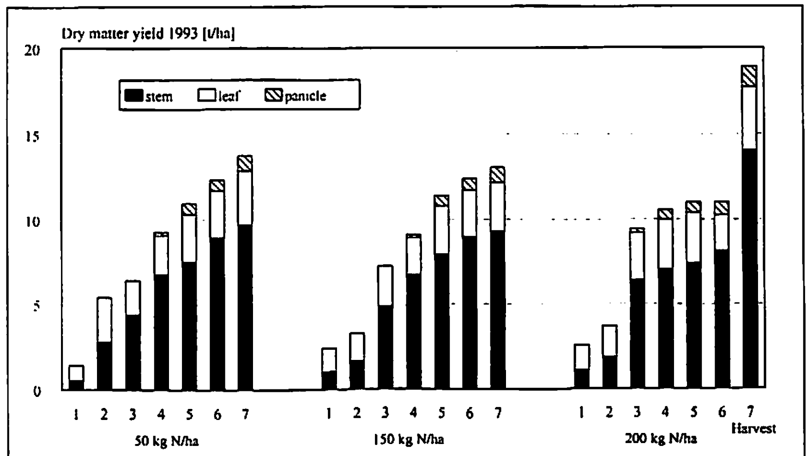
5.3 Results of Productivity Trials

The cultivar 'Korall' was sown on 12.05.93 with a drilling machine. The distance between the rows was 0.70 m and 0.085 m within the rows between the plants. Nitrogen fertilisation was applied at three different levels of 50, 150 and 200 kg N/ha, respectively. Starting on 28.06. each second week time harvests were carried out. The plants were finally harvested on 18.10.93.

The rate of emergence was about 75%. The plants showed uniform emergence and growth at all three nitrogen levels. Nonetheless, there was a difference between the nitrogen plots concerning time from sowing to panicle emergence. Plants at the highest nitrogen level started panicle emergence on 31.08.93, all other plants on 06.09.93.

Figure 21 shows the development of the dry matter yield of sweet sorghum cultivar Korall from July to October of 1993 at three different nitrogen levels as estimated from sample harvests. In addition, the proportions of stems, leaves and panicles of the whole plant are to be seen. Plants continuously developed stems, leaves and panicles with the treatment of 50 kg N/ha throughout the entire vegetation period. At the higher nitrogen levels plants had a lower growth rate at the end of July compared to those of 50 kg N/ha, but there was an increasing growth rate of dry matter yield in August obviously at the higher nitrogen supplies of 150 and 200 kg N/ha.

Figure 21. Estimated dry matter yield at different harvest dates for Korall, 1993.

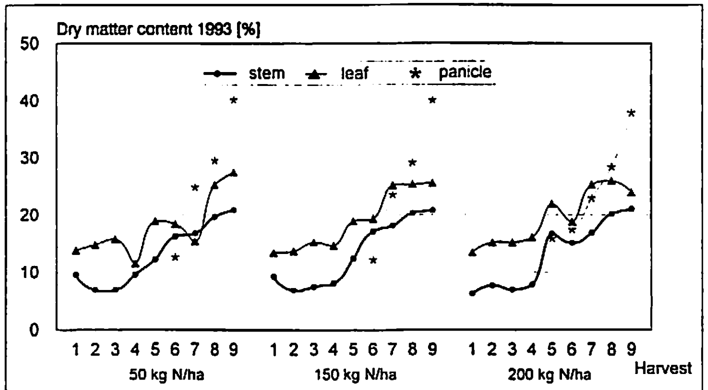


harvest	1	2	3	4	5	6	7
date	26.07.	09.08	23.08.	06.09.	20.09.	04.10.	18.10.

With respect to the dry matter content of stems, leaves and panicles in 1993 it can be seen in figure 22 that the dry matter content of each of these three plant parts had a final value greater than that of the initial value.

For each of the three nitrogen levels the dry matter content in stems had a first harvest value of between 6 and 9 % and a final harvest value of 21 %. The dry matter content in leaves had a first harvest value of 13-14 % and a final harvest value of 23-27 %. The dry matter content in panicles had a first harvest value of 12-15% and a final harvest value of 37-40 %.

Figure 22. Dry matter content of stem, leaf and panicle at different harvest dates for sorghum genotype Korall, 1993.

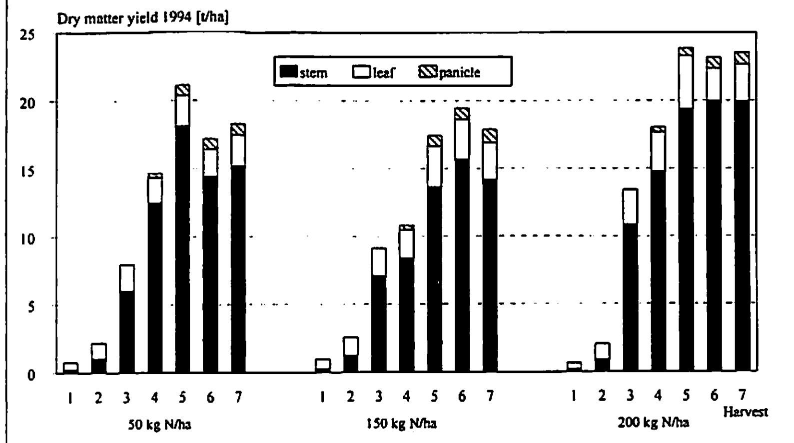


harvest	1	2	3	4	5	6	7	8	9
date	28.06.	12.07.	26.07.	09.08.	23.08.	06.09.	20.09.	04.10.	18.10.

Figure 23 shows the development of dry matter yield of sweet sorghum cultivar Korall from July to September in 1994 at three different nitrogen levels as estimated from sample harvests. In addition, the proportions of stems, leaves and panicles of the whole plant are to be seen.

1994 contrasted 1993 in that the yields from the first two harvests were lower in 1994 than in 1993, but the 3rd through the 7th harvests had consistently higher yields. Another difference is that in 1994 the final yield from each nitrogen level was lower than one of the previous harvests.

Figure 23. Estimated dry matter yield at different harvest dates for sorghum genotype Korall, 1994.



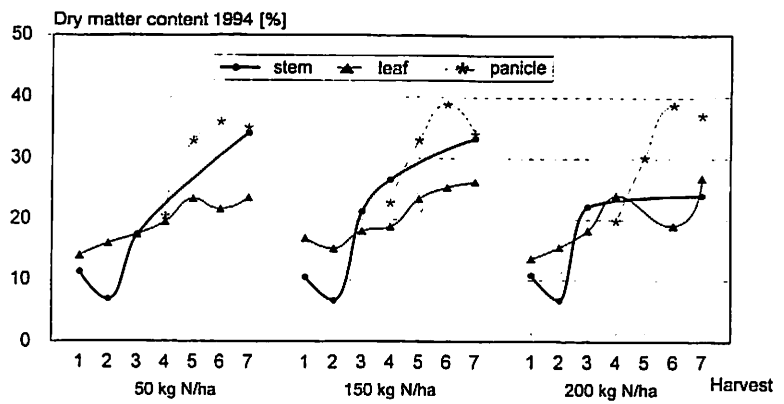
harvest	1	2	3	4	5	6	7
date	04.07.	18.07.	02.08.	15.08.	30.08.	13.09.	27.09.

With respect to the dry matter content of stems, leaves and panicles in 1994 it can be seen in figure 24 that the dry matter content of each of these three plant parts had a final value greater than that of the initial value.

For each of the three nitrogen levels the dry matter content in stems had a first harvest value of between 10 and 11 % and a final harvest value of 34 % for the 50 and 150 kg N/ha levels and 24 % for the 200 kg N/ha level. The dry matter content in leaves had a first harvest value of 13-17 % and a final harvest value of 23-27 %. The dry matter content in panicles had a first harvest value of 20-22 % and a final harvest value of 34-37 %.

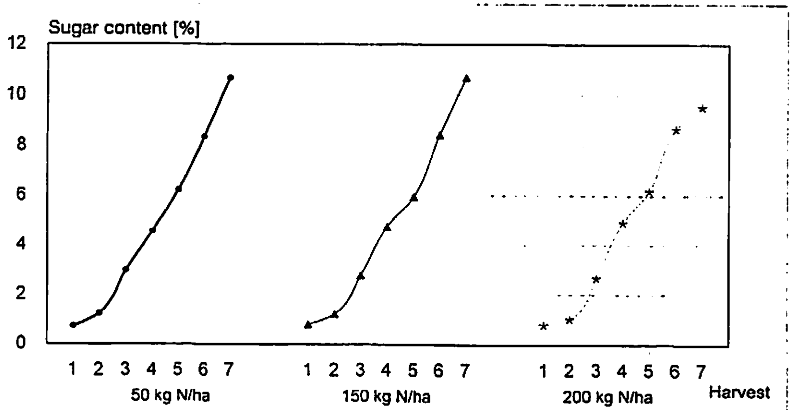
The sugar accumulation in the stems showed at steady increase throughout the 7 harvests, with the 50 and 150 kg N/ha levels having a first harvest sugar content of approximately 1.4 % and a final harvest content of about 10.8 %. The 200 kg N/ha level had a first harvest sugar content of approximately 1.5 % and a final harvest content of about 9.5 % (Fig. 25).

Figure 24. Dry matter content of stem, leaf and panicle at different harvest dates for sorghum genotype Korall, 1994.



harvest	1	2	3	4	5	6	7
date	04.07.	18.07.	02.08.	15.08.	30.08.	13.09.	27.09.

Figure 25. Sugar accumulation in the stems of sorghum genotype Korall, 1994.

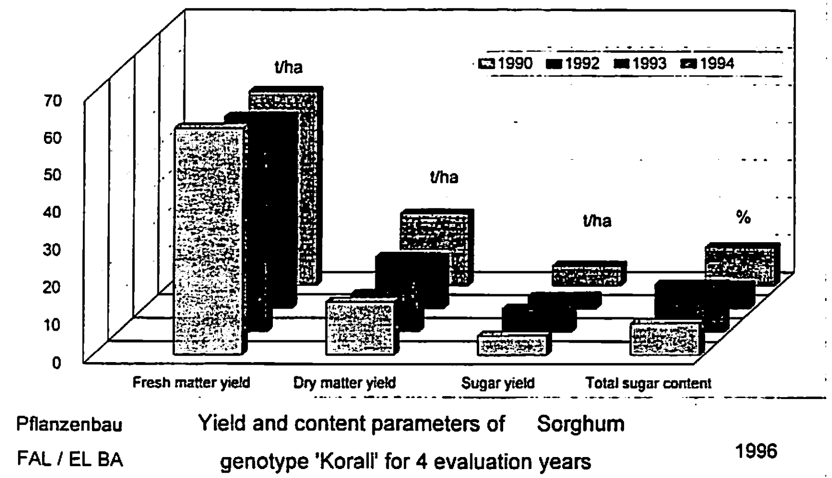


harvest	1	2	3	4	5	6	7
date	04.07.	18.07.	02.08.	15.08.	30.08.	13.09.	27.09.

Figure 26 displays the fresh matter yield, dry matter yield, sugar yield and total sugar content of the sweet sorghum genotype Korall for the evaluation years 1990, 1992, 1993 and 1994. The fresh matter yield ranged from 48.8 t/ha in 1992 to 60.4 t/ha in 1990. The dry matter yield ranged from 10.0 t/ha in 1992 to 19.1 t/ha in 1994. The sugar yield ranged from 3.2 t/ha in 1993 to 6.2 t/ha in 1992. The sugar content ranged from 6.15 % in 1992 to 12.6 % in 1991.

	1990	1992	1993	1994
Fresh matter yield (t/ha)	60.4	48.8	51.3	51.9
Dry matter yield (t/ha)	14.0	10.0	13.8	19.1
Sugar yield (t/ha)	5.1	6.2	3.2	5.3
Total sugar content (%)	8.4	12.6	6.2	10.3

Figure 26. Yield and content parameters of sorghum genotype Korall for 4 evaluation years (1990, 1992, 1993 & 1994).



5.4 Results of Database Collection

Calculations were conducted to determine the distribution frequency of the sorghum genotypes which were cultivated in the 10 year period between 1985 and 1995. These are displayed in figures 27 to 30. Figure 27 shows the distribution frequency of fresh matter yield in tons per hectare for 1280 sorghum genotypes cultivated during the 10 year period. The dominant frequency class was 40-60 t/ha of fresh matter which contained 28.1 % of the distribution or 360 genotypes. The next dominant class was 60-80 t/ha which contained 25.1 % of the distribution or 321 genotypes. The frequency classes 20-40 and 80-100 t/ha held 16.8 % and 16.7 % or 215 and 214 genotypes respectively. These four classes made up 86.7 % of the genotype distribution or 1110 genotypes. The remaining 13.3 % was made up of the 0-20 t/ha class which had 2.3 % or 29 genotypes, the 120-140 t/ha class which had 2.3% or 30 genotypes, and the > 140 t/ha class which had 0.7 % or 9 genotypes.

Figure 28 shows the distribution frequency of dry matter yield in tons per hectare for 1276 sorghum genotypes cultivated during the 10 year period. The dominate frequency class was 12-16 t/ha of dry matter which contained 26.3 % of the distribution or 336 genotypes. Next in dominance were both the 8-12 t/ha and the 16-20 t/ha classes with 22.5 % and 22.1 % or 287 and 282 genotypes respectively. These three classes made up 70.9 % of the genotype distribution or 905 genotypes. The remaining 29.1 % was made up of the 0-4 t/ha class which had 1.4 % or 18 genotypes, the 4-8 t/ha class which had 8.2 % or 104 genotypes, the 20-24 t/ha class which had 11.6 % or 148 genotypes, the 24-28 t/ha class which had 3.8 % or 49 genotypes, the 28-32 t/ha class which had 1.0 % or 13 and the > 32 t/ha class which had 3.1 % or 39 genotypes. The > 32 t/ha class contained several values that were significantly higher than 32 t/ha. Although their validity is uncertain they do not affect the general distribution.

Figure 29 shows the distribution frequency of total sugar content for 1125 sorghum genotypes cultivated during the 10 year period. Because they were both of virtually equal frequency, the dominant frequency classes were 4-6 % and 6-8 % total sugar content which contained 33.2 % and 32.5 % or 373 and 366 genotypes respectively. The next dominant class was shared by the 2-4 % and 8-10 % classes which contained 14.1 % and 14.0 % or 159 and 158 genotypes respectively. These four classes made up 93.8 % of the genotype distribution or 1056 genotypes. The remaining 6.2 % was made up of the 0-2 % class which had 3.2 % or 36 genotypes, the 10-12 % class which had 2.5% or 28 genotypes, and the > 12 % class which had 0.4 % or 5 genotypes.

Figure 30 shows the distribution frequency of sugar yield in tons per hectare for 1124 sorghum genotypes cultivated during the 10 year period. The dominant frequency class was 2-4 t/ha of sugar which contained 37.5 % of the distribution or 422 genotypes. The next dominant class was 4-6 t/ha which contained 28.1 % of the distribution or 316 genotypes. These two classed made up 65.6 % of the genotype distribution or 738 genotypes. The remaining 34.4 % was made up of the 0-2 t/ha class which had 20.4 % or 229 genotypes, the 6-8 t/ha class which had 11.3 % or 127 genotypes, the 8-10 t/ha class which had 2.2 % or 25 genotypes, the 10-12 t/ha class which had 0.3 % or 3 genotypes and the > 12 class which had 0.2 % or 2 genotypes.

Figure 27. Distribution frequency of fresh matter yield from sorghum genotypes (1985-1995).

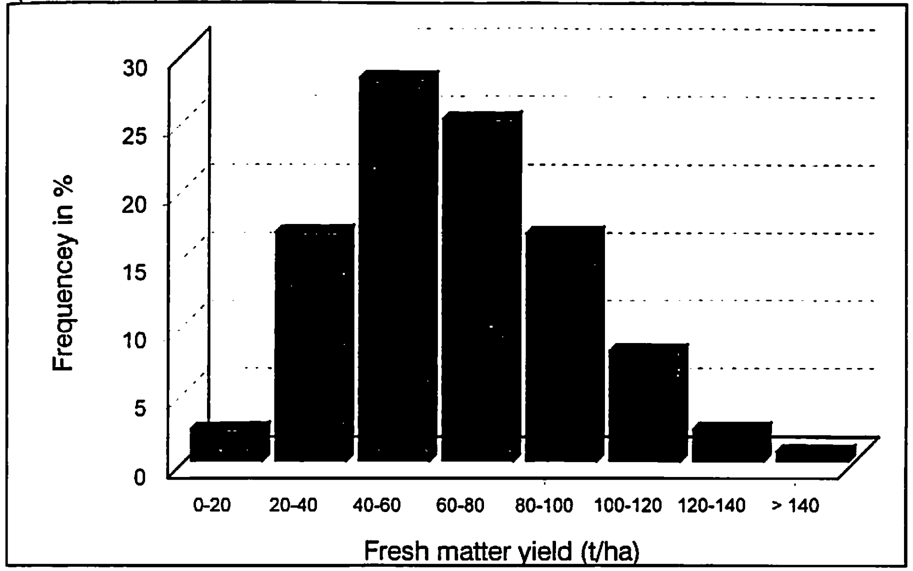


Figure 28. Distribution frequency of dry matter yield from sorghum genotypes (1985-1995).

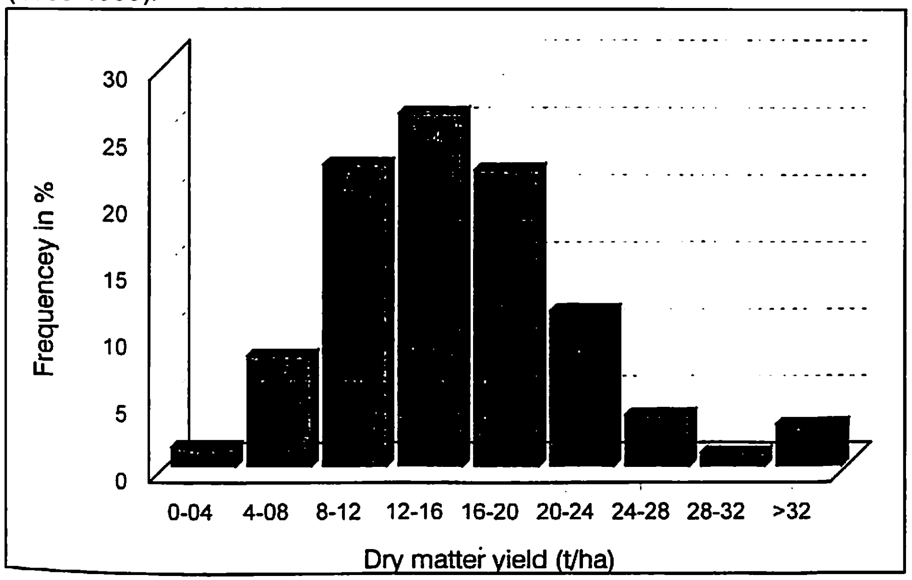


Figure 29. Distribution frequency of total sugar content from sorghum genotypes (1985-1995).

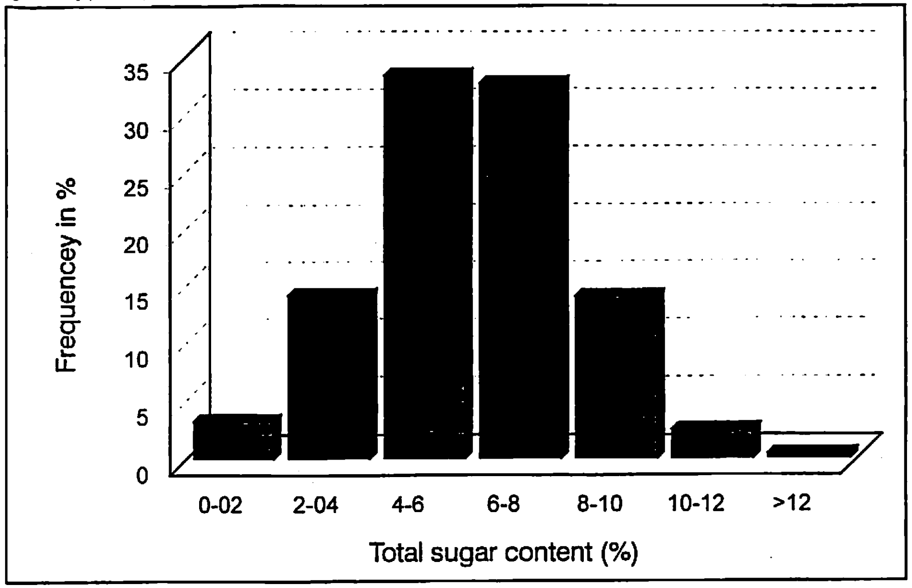
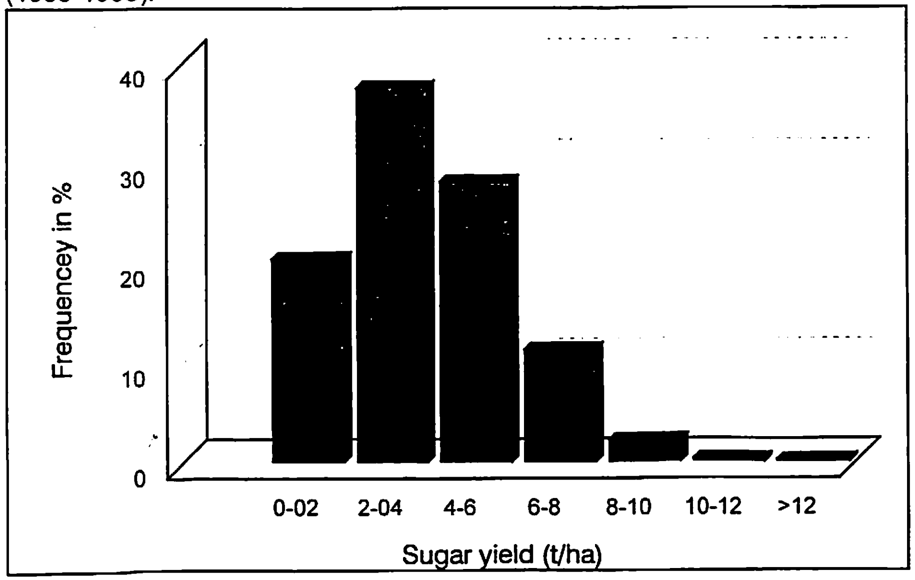


Figure 30. Distribution frequency of sugar yield from sorghum genotypes (1985-1995).



It may be concluded from this study that the sweet sorghum types which have resulted from Kleinwanzlebener Saatzucht, Germany (KWS) development are more suitable for cultivation in Middle-Europe than the tested forms from the "World Assortment." These genotypes which are also considered as "experimental hybrids" are more adapted for cooler regions. These hybrids showed relatively higher sugar content in the stalks.

Also Petrini *et. al.*, 1996 stated that remarkable results have been seen by KWS which focused their activity on the sweet sorghum producing Korall hybrid. This hybrid is particularly adapted to the northern areas of sweet sorghum cultivation: Germany, France, Belgium, etc.

5.5 Physiological Measurements

In order to verify the productivity model and to establish correlations between aerial biomass and environmental constraints, several physiological measurements were conducted in this context:

- Leaf area and leaf area index (LAI) have been determined at different stages of growth.
- Interval biomass harvesting has been conducted in order to obtain the different fractions, i.e. leaves, stems, panicles and total yield.
- Meteorological data have been collected *in situ* (temperature, precipitation, global radiation, sunshine duration, humidity and evapotranspiration).

The major accumulation of dry matter was determined during the period from late July to mid October and the sugar accumulation from late August to early November.

There was nearly linear correlation between dry matter contents and the cumulative values of Photosynthetic Active Radiation (PAR) (Fig. 31). It was obvious that the biomass growth rate was determined in periods in which temperature values were higher than 10° C. The most productive stage (the highest growth rate) started when temperatures reached 17° C and more (Fig. 32 and 33).

Figure 31. The relationship between dry matter and absorbed PAR, under non-limiting conditions.

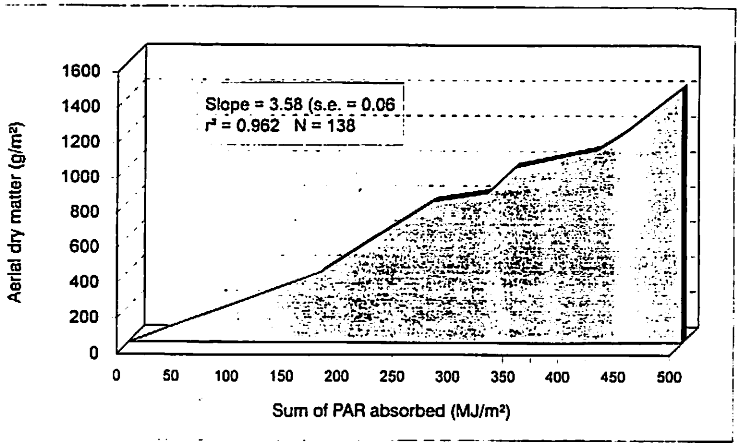


Figure 32. The correlation between leaf area index (LAI) and temperature.

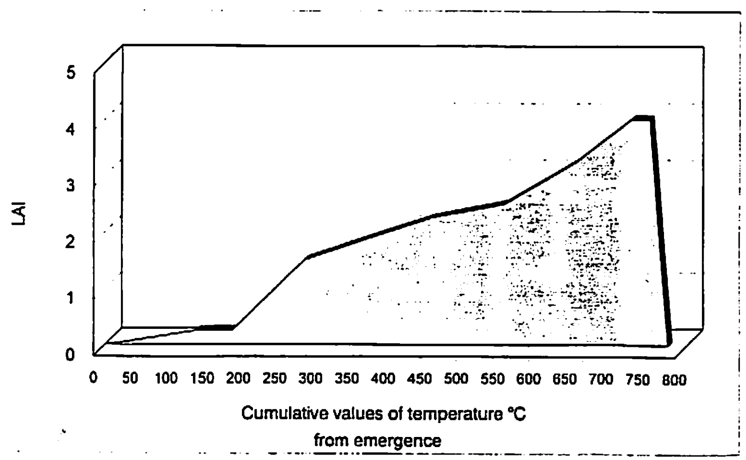
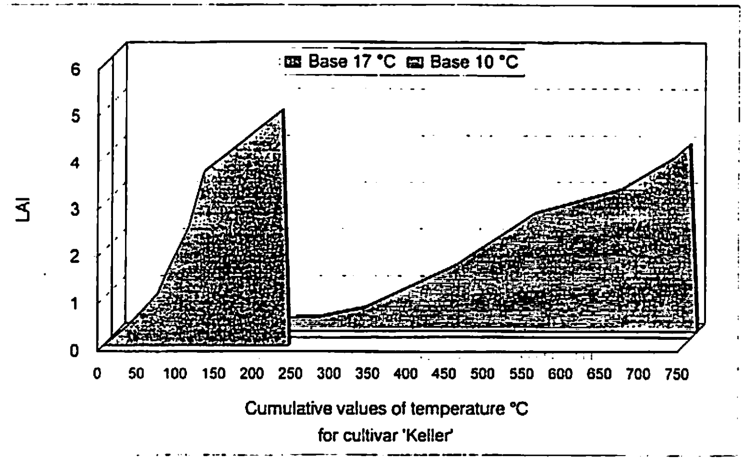


Figure 33. The correlation between leaf area index (LAI) and temperature, using base 17 °C and base 10 °C.



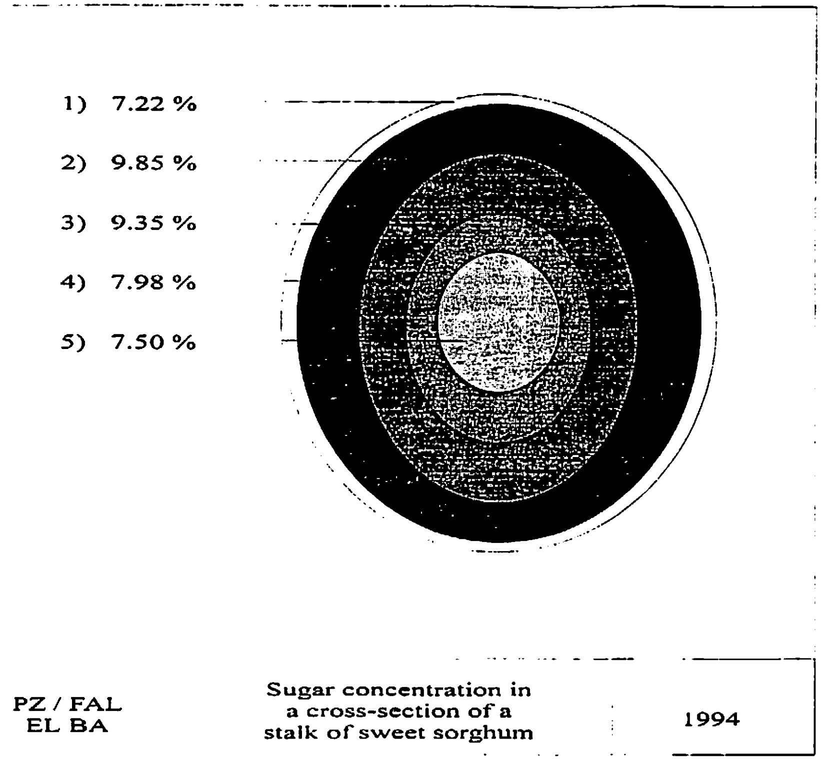
A total amount of about 500 MJ m^{-2} has resulted in the production of almost 20 tons dry matter per hectare. It could be concluded that the leaf area index (LAI) can be considered as an adequate indicator to predict the growth rate of sweet sorghum. There was a significant correlation between growth rates and LAI.

5.6 Sugar Contents and Sugar Distribution

The sugar contents were made up almost exclusively of sucrose, fructose and glucose. More than 50 % of the total sugar content consisted of sucrose, 28 % of glucose and 19 % fructose. The sugar distribution in the stem seems to be relatively uniform. The analysis of the panicle and the leaves has shown that the total sugar content of both plant parts lies between 2 and 3 %.

The determination of the sugar concentration within a cross-section of the stalk indicated that the highest sugar content (9.85 % in the fresh matter) was accumulated in the layer directly interior to the thin outer layer. The lowest concentration was found in the outer layer (7.22 %) and in the center of the stalk (7.5 %). Except for the outer layer, sugar concentrations decreased with each layer moving towards the center of the stalk (Fig. 34). These results may have importance for juice extraction technologies and for the harvesting and storage methods.

Figure 34. Sugar concentration in a cross-section of a stalk of sweet sorghum.



6. Discussion

Sorghum, *Sorghum bicolor* (L.) Moench, is known under a variety of names: great millet and guinea corn in West Africa, kafir corn in South Africa, durra in Sudan, mtama in eastern Africa, jowar in India and kaoliang in China (Purseglove, 1972). In the United States it is usually referred to as milo or milo-maize.

Sorghum belongs to the tribe Andropogonae of the grass family Poaceae. Sugar cane, *Saccharum officinarum*, is a member of this tribe and a close relative of sorghum. The genus *Sorghum* is characterised by spikelets borne in pairs. Sorghum is treated as an annual, although it is a perennial grass and in the tropics it can be harvested many times.

In 1753 Linnaeus described in his *Species plantarum* three species of cultivated sorghum: *Holcus sorghum, Holcus saccaratus* and *Holcus bicolor*. In 1794 Moench distinguished the genus *Sorghum* from the genus *Holcus*, and in 1805 Person suggested the name *Sorghum vulgare* for *Holcus sorghum* (L.). In 1961 Clayton proposed the name *Sorghum bicolor* (L.) Moench as the correct name for cultivated sorghum and this is currently being used.

The classification of sorghum by Snowden (1936) is detailed and complete. Other classifications proposed since that time have been modifications or adaptations of the Snowden system. Harlan and de Wet (1972) published a simplified classification of sorghum which has been checked against 10,000 head samples. They divided cultivated sorghum into five basic groups or races: bicolor, guinea, caudatum, kafir and durra. The wild type and shatter cane are considered two other spikelet types of *S. bicolor*. A study of polymorphisms of 11 enzymes permitted classification of sorghum into three enzymatic groups. The first includes mainly guinea varieties of West Africa; the second southern African varieties of all five races; and the third durra and caudatum types of Central and East Africa (Ollitrault, Escoute and Noyer, 1989).

The cultivated sorghum of the present arose from a wild progenitor belonging to the subspecies *verticilliflorum*. The greatest variation in the genus *Sorghum* is observed in the region of the northeast quadrant of Africa comprising Ethiopia, the Sudan and East Africa (Doggett, 1988). It appears that sorghum moved into eastern Africa from Ethiopia around 200 AD or earlier. It was adapted and carried to the savannah countries of eastern and southern Africa by the Bantu people, who used the grain mainly to make beer. The Bantu people probably began their expansion from the region of southern Cameroon about the first century AD, moved along the southern border of the Congo forest belt and reached eastern Africa possibly before 500 AD. The present-day sorghums of central and southern Africa are closely related to those of the United Republic of Tanzania and more distantly related to those of West Africa, as the equatorial forests were an effective barrier to this spread.

Sorghum was probably taken to India from eastern Africa during the first millennium BC. It is reported to have existed there around 1000 BC. Sorghum was probably taken in ships as food in the first instance; how traffic has operated for some 3,000 years between East Africa (the Azanean Coast) and India via the Sebaean Lane in southern Arabia. The sorghums of India are related to those of northeastern Africa and the coast between Cape Guardafui and Mozambique.

The spread along the coast of Southeast Asia and around China may have taken place about the beginning of the Christian era, but it is also possible that sorghum arrived much earlier in China via the silk trade routes.

Grain sorghum appears to have arrived in America as "guinea corn" from West Africa with the slave traders around the middle of the nineteenth century. Although sorghum arrived in Latin America through the slave trade and by navigators plying the Europe-Africa-Latin America trade route in the sixteenth century, the crop did not become important until the present century. The case is similar for Australia.

Grain sorghum grown primarily for food uses can be divided into milo, kafir, hegari, feterita and hybrids (Purseglove, 1972). There are other classes of sorghums such as sorghos, grass sorghums, broom-corn sorghum and special-purpose sorghum.

Sweet sorghum, because of its juicy, sweet stalks, has been a subject of scientific investigation for over 150 years (Cowley and Smith, 1972). Interest in sweet sorghum is especially important in areas of the world where other sources of sugar are difficult or impossible to produce. Its importance also increases during years when imported sugar supplies are threatened or interrupted by political or economic problems. Sweet sorghum has been used for over 100 years to produce a concentrated syrup. Sweet sorghums may differ from grain sorghums by only a few genes: those controlling plant height, the presence of juice in the stem, and the presence of sugar in the juice. Sweet sorghums have also been widely used for the production of forage and silage for animal feed.

Some varieties of high sucrose sweet sorghum were developed for crystallised sugar production by the US Department of Agriculture (USDA) and the Texas Agriculture Experiment Station with the idea of prolonging the milling period of sugar factories since the milling periods of sugarcane and sweet sorghum complement each other. With the development and release of the varieties Rio, Roma, and Ramada and the development of a method for crystallising sugar from sweet sorghum juice in the early 1970's (Smith *et. al.*, 1970), it became possible to produce crystallised sugar from sweet sorghum juice. A pilot industrial run confirmed the viability of the process in the Rio Grande Valley of Texas in the late 1970's. The following year, however, the world price of sugar dropped and the production of sugar from sweet sorghum has remained unprofitable since then.

The oil crises of 1973 and 1976 renewed interest in the commercial production of sweet sorghum for biological transformation into ethyl alcohol for use as fuel and fuel additives (Schaffert and Gourley, 1982). In 1975 Brazil created a national alcohol program (PROALCOOL) that resulted in a dramatic increase in alcohol production, principally from sugarcane (Schaffert *et. al.*, 1986b).

The great concentration of large distilleries (120,000 to 2 million litres per day capacity) and unavailable land space initially made the idea of processing sweet sorghum for alcohol impractical. However, the idea of using micro-developing and mini-distilleries (1000-20,000 litres per day capacity) in outlying areas for fuel self-sufficiency on large farms, as well as for small cooperatives and outlying small communities, awoke interest in the use of sweet sorghum for alcohol production. In central Brazil, which is agroclimatically similar to the SADCC countries, the harvesting period for sweet sorghum is from late February to May. Sugarcane is normally harvested from June to November.

There are several advantages to using sweet sorghum instead of sugarcane, as the biomass source for alcohol production (Schaffert, 1992):

- Sweet sorghum may be harvested in 4 months (whereas the first cut of sugarcane is 18 months after planting).
- Sweet sorghum production can be completely mechanised.
- The sweet sorghum crop is established from seed.
- Sweet sorghum grain may be used as either food or feed.
- The bagasse from sweet sorghum has a higher biological value than the bagasse from sugarcane when used as a forage for animals.

Petrini *et. al.*, (1992a) indicated that sweet sorghum was introduced into the USA during the 1850s. One of the first varieties grown was imported from China and distributed as Chinese Amber. Further genotypes such as Orange, Sourless, Goose-neck, White Africa, Sumac and Honey, were introduced by Leonard Wray in 1854 from South-Africa (Doggett, 1988). At the end of the nineteenth century, the varieties most widely grown for syrup production were Honey, Sugar Drip, White African, and the Ambers. Some of them, despite their susceptibility to leaf anthracnose and stalk red rot, had a wide distribution and were cultivated for a long time (Coleman, 1970).

Natural hybridisation was at first exploited as a source of variability. From the beginning of the century, rapid progress in the improvement of sorghum was reached with deliberate hybridisations between superior lines, followed by the selection in the segregating generations. Release of varieties was particularly successful during the period 1920-1950. At the end of the fifties, sorghum hybrids were available due to the finding of a successful source of cytoplasmic male sterility (Stephens and Holland, 1954). The genetic improvement of sweet sorghums followed, with a certain delay, the routes opened by grain sorghum breeders: inbred lines obtained by intentional hybridisation permitted the development of a number of varieties (Coleman, 1970). Particularly important for the introduction of new varieties for sugar and syrup production, was the role of the U.S. Sugar Crops Field Station, Meridian, Mississippi.

At Meridian, the breeding work was focused on the production of crystallised sugars and syrup. The ideal plant to be bred at the station was characterised by high yield of stalks, high percentage of extractable juice, high germination capacity, early vigour of seedlings and tolerance to lodging and diseases. Juices low in inverted sugars dextrose, levulose, starch and aconitic acid were also preferred due to their better crystallisation. Breeding was also aimed to solve the major problem of sweet sorghum susceptibility to leaf anthracnose and stalk red rot. In this respect, no significant improvements were obtained until a set of genotypes, collected by Carl O. Grassl in Africa, was imported in the middle 1940s. Many of these were resistant to the most important sorghum diseases.

At Meridian several varieties with improved carbohydrate yields were released: Sart, released in 1951, a late maturing variety, resistant to anthracnose and stalk red rot and producing a good quality syrup; Wiley, also late maturing, released in 1956, immune to red rot and leaf anthracnose, less resistant to lodging than Sart; Tracy, released in 1953, a high tonnage variety in the midseason group, susceptible to some diseases and with a high starch content in the juice; Brandes, a late-maturing variety released in 1968, very resistant to lodging (Freeman *et. al.*, 1973); Brawley and Rio, high yielding varieties, released respectively in 1958 and in 1965, selected for potential use as a sugar crop (Coleman, 1970); Theis, released in 1974, late maturing, high productivity and with intermediate resistance to lodging (Broadhead *et. al.*, 1974); Wray, a high sucrose sorghum released in 1978, resistant to maize dwarf mosaic virus, moderately susceptible to downy mildew, *Sclerospora sorghi*, (Broadhead *et. al.*, 1978).

Because of the strong influence of the sugarcane industry on policymaking in Brazil and the misconception concerning correct sugar levels that arose, the cultivation of sweet sorghum as an adequate biomass source for alcohol production in Brazil was severely delayed.

The sweet sorghum breeding improvement program in Brazil was initiated in 1980 (Schaffert *et. al.*, 1986a). It was decided that the stalks and leaves of sweet sorghum would be milled in micro- and mini-distilleries in central and southern Brazil during the season when sugarcane is not normally milled (February to June). The normal planting season for annual crops begins in October and November with the first rains of the cropping year.

New sweet sorghum cultivars for alcohol production, BR 506 and BR 507, derived from the cross of Brandes x Wray, were developed by CNPMS/EMBRAPA for central Brazil. The cultivars, selected for high extractable sugar and a stable Period for Industrial Utility, PIU, (greater than 21 days), were released in 1987. Both varieties are photoperiod nonsensitive, have excellent disease resistance, are intermediate in grain production, and have high biomass production.

The primary uses of sweet sorghum were as a syrup for human consumption and as a livestock feed. The interest in sweet sorghum has risen in developed countries because of its potential as a source of sugar and raw material for production of ethanol as an energy source, as well as for its possible utilisation in different biotechnological processes.

In order to successfully carry out a breeding program for crop improvement, the plant breeder must have a thorough understanding of how the end product will be used. In the case of sweet sorghum, whether for sugar or alcohol production, a complete knowledge of the transformation process and the period of the industrial process must be known. In this report the improvement of sweet sorghum for transformation into alcohol is considered.

Research activities were initiated in Europe (Hungary, Italy, Germany and France) to evaluate the potential of the sweet sorghum germplasm as a possible alternative crop and to develop a sugar plant which might enlarge the diversity within the crop rotation and to overcome the increasing phytopathological risks of nematodes and rhizomania in the sugar beet cultivated areas (Dambroth, 1985; Kresovich *et. al.*, 1983; Moritz, 1986; El Bassam *et. al.*, 1987).

Specific aims of the Italian programme are: the transfer of male sterility and low size in some sugar varieties for obtaining hybrids with high vigour and high fermentable sugar content; the selection of inbred lines either monostelic or polistelic to employ as varieties or as pollinants in hybrid production. Transfer of male-sterility and low size is obtained through a backcross in which in the last few years several sterile-male lines with their isogenic maintainer have been made available for the breeding of hybrids with high sugar content. The selection programme so far carried out allowed to constitute 28 inbreeds, 13 of them monoculm (Petrini *et. al.*, 1992b).

In Germany, KWS, (Kleinwanzlebener Saatzucht AG) started in 1982 to evaluate the performance of sweet sorghum varieties from a world-wide collection and started in 1985 with a special breeding program to produce adapted varieties. This programme was aimed at producing the following types of sweet sorghum (experimental hybrids):

Sugar types (high sugar content)
Fibre types (high fibre content)
Combination types
Fresh matter types (high fresh matter yield)

The most well known sweet sorghum variety of KWS is Korall.

Another German seed company which offers sweet sorghum seeds is DSV, (Deutsche Saatgutveredelung), Lippstadt. This company supplies the market with two varieties: Lisorax and Sorsa 7.

With respect to this report, "Sweet Sorghum, a Sustainable Crop for Energy Production in Europe," the research was aimed at obtaining information on potential productivity in tested environments and on the available sorghum genotypes. It always considered reference to quality of the product for industrial uses.

The wide adaptability of sorghum of tropical origins has been pointed out by Smith *et. al.* (1987). They demonstrated that in the USA, in an area between 21° and 47° parallel the stalk production ranged from between 50 to 90 tons fresh matter per hectare, while the fermentable sugar production from 4 to 17 tons per hectare.

The results achieved at the latitude (52° 17' 35" north) within the framework of this EU-project ranged from 8.7 to 34.5 tons of dry matter per hectare and sugar yield up to 8.7 tons per hectare. The highest sugar content obtained was 12.9 %.

Previous studies at this location (El Bassam *et. al.*, 1987; El Bassam and Seidewitz, 1988; Dambroth and El Bassam, 1990) showed that the highest yield in 1985 was 140 tons fresh matter and in 1986 160 tons fresh matter per hectare. For those studies in the first year 18 genotypes and in the second evaluation year 32 genotypes produced more than 90 tons per hectare. The number of accessions which delivered more than 90 tons per hectare of fresh matter in both years was 10.

The investigations (El Bassam *et. al.*, 1987) have also shown that the dry matter contents of the different genotypes could rise as high as 30 %. The highest sugar content in the investigated cultivars was as high as 9.2 % in the first year and 11.1 % in the second year. Eleven genotypes showed a sugar content of higher than 10 %.

The sugar yield is a function of the biomass yield and the sugar content of the different types of sweet sorghum. On average for the high sugar yielding accessions more than 50 % of the sugar consists of saccharose, 28 % of glucose and 19 % fructose. The sugar distribution in the stem seems to be uniform between 9 and 12 %. The sugar contents of the panicles and the leaves ranges between 2 and 3 % (El Bassam *et. at.*, 1987).

The sugar content was made up almost exclusively of sucrose, fructose and glucose (dextrose). It is known that dextrose and fructose hamper the crystallisation of sucrose during the sugar production process, but they are extremely important starting materials for biotechnological processes and in the production of syrup. Sorghum types having 10 % and more sugar content in the biomass have an average sucrose content of approx. 53 %, a dextrose content of 28 % and a fructose content of 19 %.

Apart from the genetic constitution, it must also be expected that the sugar/starch ratio in any given plant will also vary with the climatic conditions. This affects the further processing of the raw materials obtained from the biomass as well as the alcohol yield. The alcohol yield can be illustrated by the following calculations based on two types of sugar sorghum.

Taking a relatively high yielding genotype with a yield of 115.4 t biomass/ha at a sugar content of 10.6 % (7.0 % sucrose, 3.6 % dextrose + fructose).
The theoretical ethanol yield is as follows:

7.0 x 0.6776 = 4.74 l ethanol/100 kg biomass (sucrose)
\+ 3.6 x 0.6439 = 2.31 l ethanol/100 kg biomass (dextrose + fructose)

i.e. this results in a total yield of 7.05 l ethanol/100 kg biomass.

However, the efficiency of the fermentation process is only approximately 90%, and that of the distillation step 95 %. This results in a corrected total yield of 7.05 x 0.855 = 6.03 l ethanol/100 kg biomass. Given a total yield of 115.4 t biomass/ha, this means an ethanol yield of 6,960 l/ha. Applying the same mathematical formula to a genotype having a relatively low yield performance (78 t biomass/ha, 2.6 % sucrose and 4.4 % dextrose + fructose) gives a total ethanol yield of 3,060 l/ha.

Further attempts have been carried out in order to characterise the sugar distribution in the stalks. Sugar analysis of the biomass in several internodes showed that sugar concentration in the stalk from the top to the first internode at the bottom was more or less similar. This is an indication that the transport, accumulation and transformation of the assimilates is well balanced.

The determination of the sugar content in samples taken from a cross-section profile from a stalk of sweet sorghum ZH 108 shows that the higher sugar concentration (9.85 % in the fresh matter) was accumulated in the layer directly interior to the thin outer layer. The lowest concentration was found in the outer layer (7.22 %) and in the center of the stalk (7.50 %). Except for the outer layer, sugar concentrations decreased with each layer moving towards the center of the stalk.

It can be concluded, from the results obtained in this project, that there are some hybrids which delivered over 2 years good results concerning the biomass and sugar production, i.e. Korall, ZH 105 and ZH 108 which might be recommended for locations similar to our latitude.

The investigation of the relationship among sorghum characteristics evaluated in these experiments contributes to the definition of the most suitable plant type which optimises biomass and sugar production.

The conclusion stated by Belletti *et. al.*, (1991), that the traits are connected to the duration of the emergence-flowering period, assuming that the late maturing genotypes have higher potentialities in terms of biomass and total sugar yield can not be confirmed at this stage of investigations. In order to find out the best cycle length, several factors should be considered, among them the pedoclimatic conditions of the area and the interest constraints.

The major accumulation of dry matter took place in the last vegetation period August until October, the sugar accumulation started later and continued till harvesting time.

The relationship between aerial dry matter weight and PAR absorbed by the crop was studied from data obtained at different growth stages and from daily solar radiation data recorded *in situ*. The efficiency PAR (photosynthetic active radiation) absorption was estimated as a function of LAI using the K determined INRA.

The results achieved indicate the relationship between the sum of PAR absorbed during the vegetation time and the dry matter accumulation at the Braunschweig location. A sum of about 500 MJ/m² was enough to produce nearly 20 tons dry matter per hectare, which is almost identical with the site in Grignon, France of higher PAR.

Also there was a significant correlation between leaf area index (LAI) and the sum of temperature during the growing season. It could be concluded that the development of the LAI should be used as an indication of the productivity at a given location and environment.

These results indicate that sweet sorghum can be considered as a potential source for producing biomass and sugar compounds for industrial and biotechnological uses. Biomass yields of 100 tons/ha and sugar production of 10 tons/ha were possible some of the years with certain cultivars, but can not be taken as a realistic level for production under practical management systems. Moreover, it seems to be quite possible that yields of 60-80 t fresh matter and sugar contents of 6-8 % in fresh matter can be achieved in average also under German conditions.

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8. Annex 1

Meteorological data for the period 1985 - 1995. Complete data on different meteorological parameters are given in annex 1. These data are essential to evaluate and discuss the results of the database collection.

MONTHLY SUMMARY OF WEATHER DATA
1985-1995

1985	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	8.0	-18.7	-4.6	-26.6	-9.3	6.3	39	505	69	263	8149	7.8	40	0.5	6	34
February	9.7	-15.0	-2.0	-19.1	-7.1	8.3	99	1016	37	545	15247	5.2	11	1	14	-3
March	12.7	-4.2	3.3	-6.7	-1.0	9.4	68	1417	141	653	20232	6.6	32	2.1	19	13
April	22.9	-2.0	8.3	-4.0	3.2	12.6	146	2383	240	1196	35873	14.2	71	5.3	48	23
May	29.1	1.4	14.2	-1.6	6.5	14.9	231	2677	570	1806	55975	16.7	52	6.8	88	-36
June	27.0	6.1	13.9	2.6	7.8	15.5	190	3012	520	1731	51938	25.2	114	5.8	64	50
July	30.5	7.2	17.3	3.5	10.5	15.2	232	2702	600	1784	55293	13	69	5.9	84	-15
August	33.1	8.6	16.7	6.4	10.0	13.5	213	2370	665	1507	46713	8.9	45	8	88	-43
September	26.6	6.4	13.7	2.3	8.4	10.5	144	1582	278	1005	30150	7	30	3.3	48	-18
October	26.4	-0.8	9.9	-4.4	5.5	10.3	90	1330	116	538	16684	9.6	18	3.8	31	-13
November	16.4	-6.4	1.6	-12.1	-1.9	6.9	44	681	46	261	7820	7.4	36	1.2	13	23
December	14.9	-8.9	5.0	-14.7	1.4	5.6	22	362	34	140	4331	14.4	58	1.6	14	44
Summary	33.1	-18.7	8.1	-26.6	2.8	15.5	1518	3012	34	955	348405	25.2	574	8	517	57

1986	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	10.5	-11.8	0.7	-16.0	-2.6	6.3	33	393	64	211	6536	10.1	67	0.6	10	57
February	4.2	-20.6	-7.1	-27.2	-14.0	8.4	99	1133	66	602	16863	2.2	9	0.8	8	1
March	14.1	-14.4	3.5	-21.4	-1.5	9.7	97	1480	69	718	22252	9.5	59	1.9	20	39
April	19.1	-5.4	6.7	-9.1	1.4	11.8	108	2080	149	1042	31249	7	36	3.2	42	-6
May	26.0	3.4	14.4	-1.0	6.6	14.4	216	2782	414	1800	55810	14.8	52	6.3	88	-36
June	29.2	4.5	16.2	2.6	8.1	14.8	241	3043	321	2007	60218	35.6	85	5.7	95	-10
July	30.7	7.9	17.4	2.5	10.1	14.3	201	2777	662	1806	55989	15.1	69	7	103	-34
August	32.2	8.2	16.5	5.4	10.3	13.2	189	2417	317	1522	47167	17.6	66	7.2	92	-26
September	21.2	3.5	11.4	0,0	6.1	10.7	116	1648	285	941	28242	28.8	52	2.3	42	10
October	24,0	1.8	10.5	-2.6	4.7	9.2	128	1338	164	645	20009	13.7	49	3.6	41	8
November	16.1	-2.8	7.5	-6.6	2.8	7.5	89	655	75	332	9972	6.1	22	2.2	24	-2
December	11.7	-6.2	2.9	-8.5	-0.6	5.9	47	393	27	186	5757	25.5	141	1.1	13	128
Summary	32.2	-20.6	8.4	-27.2	2.6	14.8	1563	3043	27	989	360909	35.6	707	7.2	579	128

1985-1995

1987	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	6.6	-22.2	-6.4	-29.7	11.0	7.7	45	672	81	258	7793	11.5	47	0.8	6	41
February	8.3	-12.0	0.0	-18.0	-5.3	9.5	65	1171	64	431	12054	12.8	52	1.1	12	40
March	12.2	-14.5	-0.5	-20.4	-7.2	9.7	142	1554	323	949	29412	5.5	37	1.6	18	19
April	25.8	-2.1	9.9	-5.9	-2.4	13.6	167	2498	382	1354	40631	6.9	24	7.5	69	-45
May	21.6	3.5	10.4	-1.3	3.9	15.5	155	2959	205	1534	47551	16.5	44	4.3	59	-15
June	31.0	5.8	14.2	1.5	8.0	14.5	156	2773	217	1512	45375	21.7	109	4.4	54	55
July	28.5	6.9	17.0	4.0	10.2	15.3	211	2878	635	1781	55224	18.8	70	5.5	77	-7
August	30.1	6.0	15.9	2.9	10.9	11.7	139	2077	387	1267	39279	11.4	71	6	64	7
September	26.8	1.0	14.4	-2.0	9.1	10.6	138	1907	422	1002	30074	12.4	75	3.8	51	24
October	21.3	0.5	9.8	-2.7	4.8	9.3	113	1287	84	633	19619	9.2	30	2.2	36	-6
November	11.7	-1.1	6.0	-4.1	3.3	3.0	9	355	16	168	5047	20.3	62	0.9	13	49
December	14.9	-8.4	2.9	-12.5	0.4	4.6	23	357	27	135	4178	10.6	48	0.8	8	40
Summary	31	-22.2	7.8	-29.7	2.5	15.5	1360	2959	16	921	336237	21.7	666	7.5	466	200

1988	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	12.6	-2.5	4.6	-5.6	1.0	6.2	51	522	36	226	6992	9	59	1.1	16	43
February	10.7	-2.0	3.3	-5.3	0.0	6.9	52	747	66	377	10939	6	49	1.4	15	34
March	12.1	-3.7	3.4	-6.6	-0.5	7.2	68	1396	164	668	20694	16.2	104	1.5	16	88
April	23.9	-4.6	8.3	-9.6	0.6	12.9	208	2326	420	1545	46361	3.6	14	5.1	64	-50
May	27.4	2.8	15.1	-1.4	5.5	14.0	265	2705	814	2024	62753	5.8	12	6.8	124	-112
June	26.4	6.4	15.2	1.5	9.3	15.6	144	3094	236	1517	45509	26.8	86	4.5	61	25
July	29.1	10.4	17.6	7.1	10.9	14.2	197	2638	699	1723	53404	12	79	4.9	92	-13
August	28.7	7.9	17.5	3.0	10.1	13.1	222	2416	783	1645	50992	4.8	22	5.6	105	-83
September	25.5	6.5	13.9	2.0	8.0	11.4	127	1733	248	984	29525	9.2	41	4.6	57	-16
October	18.8	0.8	9.9	-2.7	5.0	8.5	83	1350	85	536	16611	5.9	21	3	31	-10
November	13.2	-8.2	4.1	-12.5	-0.1	7.2	49	712	73	275	8261	11.6	47	1.2	16	31
December	10.3	-6.2	4.1	-10.4	0.8	5.7	31	385	47	152	4712	13.4	69	0.8	10	59
Summary	29.1	-8.3	9.8	-12.5	4.2	15.6	1495	3094	36	975	356753	26.8	602	6.8	607	-5

MONTHLY SUMMARY OF WEATHER DATA
1985-1995

1989	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	9.6	-5.7	3.8	-8.5	-0.1	7.4	61	615	42	248	7693	4.7	17	1.1	12	5
February	14.1	-3.0	4.4	-5.0	0.5	8.2	89	772	94	467	13084	17.3	47	1.6	18	29
March	23.3	-0.9	7.6	-4.5	1.8	9.9	124	1764	222	863	26747	11.2	46	3.7	35	11
April	20.5	-2.9	7.6	-6.1	2.4	10.3	111	1984	189	1106	33180	9.2	38	3.7	48	-10
May	27.0	0.8	14.3	-4.0	3.5	15.1	337	2872	1239	2315	71779	2	2	6.9	118	-116
June	29.4	5.1	16.3	1.0	6.8	15.6	279	3046	336	2182	65447	15.5	36	7	118	-82
July	32.5	8.0	18.1	3.9	11.1	14.1	193	2831	895	1644	50967	12.2	45	8.9	108	-63
August	32.8	7.0	17.8	3.6	10.5	13	230	2239	144	1581	49025	27.1	83	7.9	118	-35
September	28.0	7.6	15.5	3.4	8.7	10.7	142	1837	258	1035	31037	6.6	29	5.1	64	-35
October	22.0	0.9	11.6	-3.2	6.1	10.3	121	1342	127	625	19390	17.8	43	3.5	42	1
November	15.1	-6.9	3.6	-11.1	-1.7	7.1	111	585	45	486	11653	5.4	28	1.8	20	8
December	14.2	-7.8	3.3	-10.4	-0.5	5.3	38	383	25	175	5420	23.6	79	1.2	13	66
Summary	32.8	-7.8	10.3	-11.1	4.1	15.6	1836	3046	25	1056	385422	27.1	492	8.9	713	-221

1990	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	12.8	-5.8	4.2	-9.2	0.6	6.4	43	578	29	218	6753	6.8	17	1.6	16	1
February	16.8	-0.3	7.1	-0.6	1.8	9.6	108	1025	80	537	15027	34.3	94	2.2	29	65
March	21.1	-0.2	8	-2.9	2.1	10.5	128	1539	173	815	25279	5.4	20	4	37	-17
April	21.1	-4.9	8.2	-9.7	1	12	198	2194	417	1459	43783	7	40	4.6	54	-14
May	26.7	4.1	14.1	-1	3.7	14.2	308	2882	826	2147	66553	9.4	39	7.3	108	-69
June	27.6	7.1	15.8	3.4	9.3	12.1	145	2652	266	1603	48089	22.1	63	5	76	-13
July	31.3	7.3	16.9	2.5	9	14	239	2589	636	1837	56954	12.7	25	8	96	-71
August	35.5	8.4	19.1	4.5	11.3	14.5	245	2643	408	1642	50895	20.9	77	10.5	129	-52
September	20.3	5.3	12.4	1.4	7.9	10.7	97	1669	172	851	25537	16.1	100	2.6	38	62
October	23.4	-1.3	11.1	-5.8	5.1	9.1	165	1210	251	732	22707	10.5	20	3.1	46	-26
November	13.6	-2.1	5.3	-5.7	2.5	6.1	41	491	34	238	7146	23.9	65	0.9	11	54
December	9.3	-4.7	2.1	-8	0.6	6	45	410	10	180	5566	12.6	55	0.9	10	45
Summary	34.5	-5.8	10.4	-9.7	4.6	14.5	1759	2882	10	1025	374289	34.3	615	10.5	650	-35

1991	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	12.7	-7.2	2.7	-11.1	-0.5	7.4	70	633	55	252	7818	18	36	1	15	21
February	13.7	-14	-2.0	-20.0	-7.7	9.4	85	1267	116	583	16335	2.6	9	1.5	13	-4
March	18.7	-3.1	7.5	-7.5	1.7	9.9	112	1738	247	862	26740	13.6	21	2.8	34	-13
April	19.5	-3.2	7.9	-7.7	-0.6	12.0	200	2051	457	1483	44494	4.8	14	4.6	66	-52
May	21.4	0.7	10.1	-3.6	3.4	14.3	166	2765	582	1696	52584	10.4	37	4	63	-26
June	23.5	4.7	13.7	0.0	7.8	11.5	151	2563	347	1597	47911	33.3	97	4.1	65	32
July	30.6	9.6	19.2	5.4	11.2	15.5	294	2920	967	2062	63926	11.1	47	6.1	109	-62
August	31.5	7.7	17.9	3.7	11.3	12.6	213	2284	504	1511	46845	13.7	31	7.2	96	-65
September	28.1	3.3	15.2	-1.3	8.1	11.9	171	1928	279	1132	33935	7.4	25	5.7	79	-54
October	21.8	-2.1	9.2	-5.6	3.4	9.2	157	1068	102	726	22499	4.8	30	2.8	36	-6
November	15.6	-4.0	4.6	-7.8	1.1	7.3	64	630	80	307	9199	14.4	72	1.9	15	57
December	12.3	-9.5	2.3	-11.0	-0.8	5.8	50	343	29	177	5486	20.3	51	1	12	39
Summary	31.5	-14.0	9.0	-20.0	3.2	15.5	1735	2920	29	1035	377772	33.3	470	7.2	603	-133

1992	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	11.0	-9.0	1.9	-10.6	-0.6	6.5	43	469	37	180	5579	18.6	40	0.9	8	32
February	15.0	-4.9	4.3	-8.6	0.4	9.1	62	977	110	393	11384	5.4	27	1.8	16	11
March	15.7	-1.0	5.6	-3.8	0.6	9.6	102	1478	188	739	22913	20.1	78	2.1	29	49
April	19.9	-1.5	8.6	-4.7	2.3	9.9	142	1825	199	1205	36137	10.5	55	3.4	55	0
May	27.6	1.2	15.1	-3.1	5.6	14.4	294	2741	452	2065	64025	8.3	21	6.8	116	-95
June	31.0	8.6	18.6	3.2	8.9	15.0	270	2965	766	2183	65481	10.6	39	9.7	130	-91
July	34.4	8.3	19.3	4.0	11.0	14.3	241	2899	252	1869	57932	7.6	45	9.5	125	-80
August	38.2	-0.2	19.4	6.8	12.7	12.7	211	2435	361	1563	48467	11.5	60	12	123	-63
September	25.1	5.9	14.0	1.9	7.3	11.2	174	1732	318	1162	34869	4.6	17	4	70	-53
October	17.0	-3.0	6.8	-7.1	2.3	9.5	91	1170	96	511	15856	12.2	87	2.3	23	64
November	13.3	-1.7	6.1	-4.9	2.6	7.6	56	740	77	262	7846	14.1	79	1.2	16	63
December	13.5	-7.0	2.2	-9.0	-0.6	5.1	47	325	30	162	5023	21.4	65	1.2	10	55
Summary	38.2	-9	10.2	-10.6	4.4	15	1731	2965	30	1026	375512	21.4	611	12	712	-101

MONTHLY SUMMARY OF WEATHER DATA
1985-1995

1993	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	13.5	-13.4	2.9	-17.9	-0.9	7.0	67	674	48	259	8029	11.1	65	1.2	16	49
February	6.7	-11.1	-0.1	-15.4	-3.2	9.3	61	1030	112	411	11520	10	22	0.6	8	14
March	16.2	-5.2	4.6	-9.0	-1.6	10.1	156	1686	149	977	30295	4	11	2.5	34	-23
April	25.8	-1.2	11.1	-4.6	3.2	12.6	191	2286	593	1518	45538	15.8	38	7.3	89	-51
May	28.0	1.9	14.9	-2.1	6.9	15.4	230	2788	546	1780	55187	32.7	67	7.3	102	-35
June	27.6	6.0	15.7	2.6	8.8	15.0	215	3038	660	1927	57811	15.3	61	5.4	87	-26
July	28.1	8.3	16.1	4.0	10.3	15.6	178	2935	513	1595	49452	29.6	128	6.4	72	56
August	27.4	6.6	15.4	2.6	9.5	13.4	196	2325	343	1442	44699	14.1	59	4.9	75	-16
September	22.0	2.6	12.3	-0.6	7.8	10.6	119	1941	117	903	27086	15.9	66	2.5	36	30
October	20.6	-3.3	8.5	-7.1	4.1	9.4	93	1256	112	550	17062	10.1	34	2.4	30	4
November	9.9	-9.6	0.4	-13.9	-2.3	5.7	36	475	29	220	6585	12.5	28	0.8	8	20
December	13.7	-8.2	3.8	-12.7	0.5	3.7	19	307	59	146	4525	12	107	0.7	10	97
Summary	28.1	-13.4	8.8	-17.9	3.6	15.6	1560	3038	29	980	357789	32.7	686	7.3	568	118

1994	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	11.9	-3.1	4.0	-6.4	0.9	5.3	30	455	42	183	5677	23.8	87	0.9	12	75
February	13.0	-13.4	-0.7	-18.8	-5.4	9.0	83	958	86	506	14180	5.2	22	1.2	14	8
March	17.3	-1.7	6.5	-5.6	2.2	8.2	96	1503	128	703	21780	17.8	99	2	25	74
April	22.1	0.0	9.3	-3.9	2.2	11.5	184	2197	197	1394	41805	34.2	87	4.9	60	27
May	22.1	2.6	13.1	-1.0	6.6	13.9	203	2624	298	1697	52615	15.8	60	3.9	69	-9
June	29.9	5.9	15.9	1.8	9.5	15.3	238	3031	539	1963	58878	32.9	56	5.7	86	-30
July	34.6	9.9	21.9	5.8	12.1	15.1	345	2896	383	2272	70426	22.7	43	10.9	177	-134
August	36.5	7.9	18.2	4.5	11.7	13.7	233	2419	360	1601	49638	21.9	126	11.4	110	16
September	23.3	3.7	13.5	0.6	8.6	10.2	116	1716	248	932	27972	8	42	3	42	0
October	17.4	-4.7	8.0	-8.6	2.3	9.4	136	1276	117	672	20833	10.3	40	1.7	31	9
November	15.2	-1.0	7.7	-3.9	4.2	7.8	54	702	50	263	7886	10.7	41	1.3	17	24
December	13.5	-5.1	4.6	-9.7	0.9	4.9	50	341	56	190	5887	18.7	51	1	16	35
Summary	36.5	-13.4	10.2	-18.8	4.7	15.3	1767	3031	42	1034	377577	34.2	752	11.4	659	93

1986-1995

1995	Air temperature (°C) at 2 m height			Lowest temperature at soil's surface (°C)		Sunshine duration in hours		Global solar radiation (J/cm2)				Precipitation in mm		Evaporation in mm		Water balance
	max.	min.	month's mean	min.	month's mean	max.	month's total	max.	min.	month's mean	month's total	max.	month's total	max.	month's total	
January	12.1	-11.9	1.1	-15.9	-2.5	6.5	61	460	72	253	7837	11.4	75	1.2	12	63
February	13.2	-2.9	5.5	-6.4	1.8	9.3	75	1010	70	430	12036	14	62	1.5	19	43
March	14.4	-3.1	3.9	-6.5	-1.1	10.6	144	1861	263	885	27449	22.7	69	1.9	26	43
April	22.9	-0.7	8.9	-4.7	3.1	12.7	151	2271	270	1268	38032	10.6	44	4.8	51	-7
May	25.8	1.2	12.7	-4.1	5.0	14.0	227	2903	247	1745	54099	9	47	6.2	84	-37
June	27.2	6.4	14.8	2.3	8.1	15.7	225	3050	443	1928	57832	14.7	56	5.2	77	-21
July	32.7	8.3	20.4	3.8	12.7	14.3	290	2738	966	2111	65445	15.1	52	7.9	125	-73
August	31.8	7.9	19.1	2.8	10.2	14.1	274	2698	721	1796	55661	17.5	47	8.7	140	-93
September	24.2	4.2	13.5	2.4	8.4	9.8	126	1588	93	953	28592	15.5	85	3.7	47	38
October	25.8	0.8	12.5	-3.5	6.4	9.6	123	1135	154	654	20274	7.5	22	3.3	39	-17
November	12.6	-4.7	3.9	-9.0	-3.3	7.0	53	703	42	265	7952	9.9	42	0.9	12	30
December	10.0	-12.9	-2.1	-17.6	-4.6	5.4	20	371	32	143	4433	8.7	22	0.4	5	17
Summary	32.7	-12.9	9.5	-17.6	3.9	15.7	1767	3050	32	1040	379642	22.7	621	8.7	637	-16

9. Annex 2

Origin, donor and index of the evaluated genotypes.

INSTITUTO NACIONAL DE TECNOLOGIA AGROPECUARIA, EEA, INTA

5988 MANFREDI (BA.)
ARGENTINA

Genotype	Probno.	Origin Country	Donor
ATLAS X SUNRISE	223		ARGINTA1
CHIKEN CORN	222		ARGINTA1
EARLY SUMAC	220		ARGINTA1
GUATRACHE	218		ARGINTA1
HONEY	219		ARGINTA1
KANSAS ORANGE	217		ARGINTA1
KANSAS ORANGE	221		ARGINTA1
LEOTI	99		ARGINTA1
REX MINISTERIO	216		ARGINTA1

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION (CSIRO)

CANBERRA
AUSTRALIA

Genotype	Probno.	Origin Country	Donor
EARLY ORANGE	3388	AUS	AUSCSIRO

INSTITUT SUPERIEUR INDUSTRIEL
RUE SAINT VICTOR 3
4500 HUY
BELGIUM

Genotype	Probno.	Origin Country	Donor
SORGHAL	3648	BEL	BELISIHUX

INSTITUTE OF INTRODUCTION AND PLANT GENETIC RESOURCES

4122 SADOVO, PLOVDIV
BULGARIA

Genotype	Probno.	Origin Country	Donor
CV.133 B REX	306		BGRIIPR
CV.SS-4	305		BGRIIPR
	304		BGRIIPR

EMBRAPA, CENTRO NACIONAL DE PESQUISA DE TRIGO

PASO FUNDO
BRAZIL

Genotype	Probno.	Origin Country	Donor
027335 BR 501	311	BRA	BRAEMBRAPA
027651 BR 503	312	BRA	BRAEMBRAPA
033090 CMSXS 623	314	BRA	BRAEMBRAPA
033138 CMSXS 603	319	BRA	BRAEMBRAPA
033162 CMSXS 615	315	BRA	BRAEMBRAPA
044130 BR 505	313	BRA	BRAEMBRAPA
044156 BR 500	317	BRA	BRAEMBRAPA
044164 BR 502	320	BRA	BRAEMBRAPA
044172 BR 504	318	BRA	BRAEMBRAPA
069272 CMSXS 614	316	BRA	BRAEMBRAPA
069281 CMSXS 634	321	BRA	BRAEMBRAPA
069299 CMSXS 635	322	BRA	BRAEMBRAPA
069302 CMSXS 636	323	BRA	BRAEMBRAPA
069311 CMSXS 637	324	BRA	BRAEMBRAPA
069329 CMSXS 638	325	BRA	BRAEMBRAPA
069337 CMSXS 639	326	BRA	BRAEMBRAPA
069345 CMSXS 640	327	BRA	BRAEMBRAPA
069353 CMSXS 641	328	BRA	BRAEMBRAPA
069361 CMSXS 642	329	BRA	BRAEMBRAPA
069370 CMSXS 643	330	BRA	BRAEMBRAPA
069388 CMSXS 644	331	BRA	BRAEMBRAPA
069396 CMSXS 629	332	BRA	BRAEMBRAPA
069400 CMSXS 645	333	BRA	BRAEMBRAPA
069418 CMSXS 646	334	BRA	BRAEMBRAPA
069426 CMSXS 647	335	BRA	BRAEMBRAPA

ASIAN VEGETABLE RESEARCH AND DEVELOPMENT CENTER
P.O. BOX 42
SHANHUA/TAINAN/TAIWAN/74199
CHINA

Genotype	Probno.	Origin Country	Donor
HYBRID NO II	676		CHNAVRDC
KELLER	675		CHNAVRDC

CHINESE ACADEMY OF AGRICULTURAL AND FORESTRY SCIENCES PEKING

PEKING
CHINA

Genotype	Probno.	Origin Country	Donor
TIAN DAO SHAO	307		CHNCAAF
TIAN GAN GAO LIANG	308		CHNCAAF

DEUTSCHE SAATVEREDELUNG, LIPPSTADT-BREMEN GMBH ZU LIPPSTADT
POSTFACH 1407
59524 LIPPSTADT
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
LIPA	3637	DEU	DEUDSVLP
LISETA	3639	DEU	DEUDSVLP
LISORA	3638	DEU	DEUDSVLP
TESA	3636	DEU	DEUDSVLP

INSTITUT FUER PFLANZENGENETIK UND KULTURPFLANZENFORSCHUNG
CORRENSSTR. 3
06466 GATERSLEBEN
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
E 700/83	425		DEUIPK
SOR 01/80	428		DEUIPK
SOR 04/83	430		DEUIPK
SOR 09/78	429		DEUIPK
SOR 1/88	3399		DEUIPK
SOR 10/83	422		DEUIPK
SOR 11/82	120	CHN	DEUIPK
SOR 11/82	424		DEUIPK
SOR 12/83	119	CHN	DEUIPK
SOR 12/83	423		DEUIPK
SOR 20/88	3402		DEUIPK
SOR 21/91	3404		DEUIPK
SOR 23/81	121	GRC	DEUIPK
SOR 23/81	427		DEUIPK
SOR 24/82	116	GRC	DEUIPK
SOR 4/83	118	CHN	DEUIPK
SOR 4/88	3400		DEUIPK
SOR 6/91	3403		DEUIPK
SOR 9/78	117	DEU	DEUIPK
SOR 9/88	3401		DEUIPK
SORGUN'S CALAIS'	426		DEUIPK

INSTITUT FUER PFLANZENBAU UND PFLANZENZUECHTUNG DER JUSTUS-LIEBIG-UNIVERSITAET
LUDWIGSTR. 23
35390 GIESSEN
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
SORSA	13		DEUJLUPZGI

KLEINWANZLEBENER SAATZUCHT AG
POSTFACH 1463
37552 EINBECK
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
1043	3361		DEUKWSEIN
1426	3355		DEUKWSEIN
1435	3349		DEUKWSEIN
1436	3350		DEUKWSEIN
1437	3351		DEUKWSEIN
1438	3352		DEUKWSEIN
1439	3353		DEUKWSEIN
1440	3354		DEUKWSEIN
1442	3362		DEUKWSEIN
1448	3364		DEUKWSEIN
1449	3365		DEUKWSEIN
1450	3366		DEUKWSEIN
1453	3367		DEUKWSEIN
1455	3369		DEUKWSEIN
1465	3374		DEUKWSEIN
1472 AF	3377		DEUKWSEIN
1474	3378		DEUKWSEIN
1475	3379		DEUKWSEIN
A 2077	213		DEUKWSEIN
A 48	212		DEUKWSEIN
A1 X AT1	3002		DEUKWSEIN
A1 X AT2	3003		DEUKWSEIN
A1 X AT3	3004		DEUKWSEIN
A1 X AT4	3005		DEUKWSEIN
A1 X ATX	3001		DEUKWSEIN
A1 X BT1	3006		DEUKWSEIN
A10 X AT1	3051		DEUKWSEIN
A10 X AT2	3052		DEUKWSEIN
A10 X AT3	3053		DEUKWSEIN
A10 X ATX	3050		DEUKWSEIN
A10 X BT1	3054		DEUKWSEIN
A10 X BT2	3055		DEUKWSEIN
A11 X AT4	3057		DEUKWSEIN
A11 X ATX	3056		DEUKWSEIN
A11 X BT1	3058		DEUKWSEIN
A12 X AT3	3060		DEUKWSEIN
A12 X AT4	3061		DEUKWSEIN
A12 X ATX	3059		DEUKWSEIN
A13 X AT3	3063		DEUKWSEIN
A13 X ATX	3062		DEUKWSEIN
A14 X AT1	3037		DEUKWSEIN
A14 X ATX	3036		DEUKWSEIN
A14 X BT1	3038		DEUKWSEIN
A15 X AT2	3039		DEUKWSEIN
A15 X AT3	3040		DEUKWSEIN
A15 X AT4	3041		DEUKWSEIN
A15 X BT1	3042		DEUKWSEIN
A15 X BT2	3043		DEUKWSEIN
A16 X AT2	3045		DEUKWSEIN

KLEINWANZLEBENER SAATZUCHT AG
POSTFACH 1463
37552 EINBECK
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
A16 X ATX	3044		DEUKWSEIN
A16 X BT2	3046		DEUKWSEIN
A17 X ATX	3064		DEUKWSEIN
A4 X AT1	3013		DEUKWSEIN
A4 X AT2	3014		DEUKWSEIN
A4 X AT3	3015		DEUKWSEIN
A4 X AT4	3016		DEUKWSEIN
A4 X ATX	3012		DEUKWSEIN
A4 X BT1	3017		DEUKWSEIN
A4 X BT2	3018		DEUKWSEIN
A5 X AT1	3020		DEUKWSEIN
A5 X AT2	3021		DEUKWSEIN
A5 X AT3	3022		DEUKWSEIN
A5 X AT4	3023		DEUKWSEIN
A5 X ATX	3019		DEUKWSEIN
A5 X BT1	3024		DEUKWSEIN
A5 X BT2	3025		DEUKWSEIN
A6 X AT3	3026		DEUKWSEIN
A6 X BT1	3027		DEUKWSEIN
A7 X AT2	3029		DEUKWSEIN
A7 X ATX	3028		DEUKWSEIN
A7 X BT2	3030		DEUKWSEIN
A8 X AT1	3032		DEUKWSEIN
A8 X AT4	3033		DEUKWSEIN
A8 X ATX	3031		DEUKWSEIN
A8 X BT1	3034		DEUKWSEIN
A8 X BT2	3035		DEUKWSEIN
A9 X AT4	3048		DEUKWSEIN
A9 X ATX	3047		DEUKWSEIN
A9 X BT1	3049		DEUKWSEIN
AGOLENE	54		DEUKWSEIN
AKB	215		DEUKWSEIN
AM 50	211		DEUKWSEIN
ATX 623	214		DEUKWSEIN
B-ORANGE	203		DEUKWSEIN
B-ROX	202		DEUKWSEIN
B11 X AT1	3312		DEUKWSEIN
B11 X AT2	3313		DEUKWSEIN
B11 X AT3	3314		DEUKWSEIN
B11 X AT4	3315		DEUKWSEIN
B11 X BT1	3316		DEUKWSEIN
B11 X BT2	3317		DEUKWSEIN
DALE	59		DEUKWSEIN
E14 X ATX	3065		DEUKWSEIN
E24 X ATX	3066		DEUKWSEIN
E25 X AT3	3067		DEUKWSEIN
E25 X AT4	3068		DEUKWSEIN
E26 X ATX	3069		DEUKWSEIN
E27 X ATX	3070		DEUKWSEIN

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37552 EINBECK
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
E28 X ATX	3071		DEUKWSEIN
E29 X ATX	3072		DEUKWSEIN
E31 X ATX	3073		DEUKWSEIN
E39 X AT3	3075		DEUKWSEIN
E39 X ATX	3074		DEUKWSEIN
E40 X ATX	3076		DEUKWSEIN
E43 X ATX	3077		DEUKWSEIN
E44 X ATX	3078		DEUKWSEIN
E46 X ATX	3079		DEUKWSEIN
E48 X AT2	3081		DEUKWSEIN
E48 X ATX	3080		DEUKWSEIN
EX1	3385		DEUKWSEIN
EX3	3387		DEUKWSEIN
F10 X ATX	3090		DEUKWSEIN
F13 X ATX	3091		DEUKWSEIN
F15 X ATX	3092		DEUKWSEIN
F17 X ATX	3093		DEUKWSEIN
F18 X ATX	3094		DEUKWSEIN
F19 X ATX	3095		DEUKWSEIN
F20 X ATX	3096		DEUKWSEIN
F21 X AT2	3098		DEUKWSEIN
F21 X AT3	3099		DEUKWSEIN
F21 X ATX	3097		DEUKWSEIN
F21 X BT2	3100		DEUKWSEIN
F23 X AT3	3102		DEUKWSEIN
F23 X ATX	3101		DEUKWSEIN
F24 X AT3	3104		DEUKWSEIN
F24 X ATX	3103		DEUKWSEIN
F26 X ATX	3105		DEUKWSEIN
F27 X AT3	3107		DEUKWSEIN
F27 X ATX	3106		DEUKWSEIN
F28 X ATX	3108		DEUKWSEIN
F29 X AT3	3110		DEUKWSEIN
F29 X ATX	3109		DEUKWSEIN
F30 X AT3	3112		DEUKWSEIN
F30 X ATX	3111		DEUKWSEIN
F32 X ATX	3113		DEUKWSEIN
F33 X ATX	3114		DEUKWSEIN
F34 X ATX	3115		DEUKWSEIN
F6 X ATX	3082		DEUKWSEIN
F8 X AT2	3084		DEUKWSEIN
F8 X AT3	3085		DEUKWSEIN
F8 X AT4	3086		DEUKWSEIN
F8 X ATX	3083		DEUKWSEIN
F8 X BT1	3087		DEUKWSEIN
F8 X BT2	3088		DEUKWSEIN
F9 X ATX	3089		DEUKWSEIN
G1 X ATX	3161		DEUKWSEIN
G10 X ATX	3163		DEUKWSEIN

KLEINWANZLEBENER SAATZUCHT AG
POSTFACH 1463
37552 EINBECK
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
G12 X ATX	3164		DEUKWSEIN
G13 X ATX	3165		DEUKWSEIN
G8 X ATX	3162		DEUKWSEIN
I4 X AT2	3117		DEUKWSEIN
I4 X AT3	3118		DEUKWSEIN
I4 X ATX	3116		DEUKWSEIN
I5 X AT3	3119		DEUKWSEIN
I5 X AT4	3120		DEUKWSEIN
I6 X ATX	3121		DEUKWSEIN
I7 X AT3	3123		DEUKWSEIN
I7 X AT4	3124		DEUKWSEIN
I7 X ATX	3122		DEUKWSEIN
I7 X BT2	3125		DEUKWSEIN
I8 X AT2	3127		DEUKWSEIN
I8 X AT3	3128		DEUKWSEIN
I8 X AT4	3129		DEUKWSEIN
I8 X ATX	3126		DEUKWSEIN
K3 X AT2	3007		DEUKWSEIN
K3 X AT3	3008		DEUKWSEIN
K3 X AT4	3009		DEUKWSEIN
K3 X BT1	3010		DEUKWSEIN
K3 X BT2	3011		DEUKWSEIN
KESOJ BARNA	204		DEUKWSEIN
KORALL	384	DEU	DEUKWSEIN
KORALL	1003		DEUKWSEIN
M81E	56		DEUKWSEIN
NKB.-8180-7437	188		DEUKWSEIN
NKB.-8180-8475	191		DEUKWSEIN
NKB.-8276-7928	193		DEUKWSEIN
NKB.-8278-7893	194		DEUKWSEIN
NKB.-8280-7894	195		DEUKWSEIN
NKB.-8361-8192	189		DEUKWSEIN
NKB.-8363-8191	196		DEUKWSEIN
NKB.-8364-8187	197		DEUKWSEIN
NKB.-8368-8189	198		DEUKWSEIN
NKB.-8478-8469	190		DEUKWSEIN
P1 X ATX	3130		DEUKWSEIN
P10 X AT3	3140		DEUKWSEIN
P10 X ATX	3139		DEUKWSEIN
P11 X ATX	3141		DEUKWSEIN
P12 X ATX	3142		DEUKWSEIN
P13 X ATX	3143		DEUKWSEIN
P14 X AT3	3145		DEUKWSEIN
P14 X AT4	3146		DEUKWSEIN
P14 X ATX	3144		DEUKWSEIN
P16 X ATX	3147		DEUKWSEIN
P19 X ATX	3148		DEUKWSEIN
P20 X ATX	3149		DEUKWSEIN
P21 X ATX	3150		DEUKWSEIN

KLEINWANZLEBENER SAATZUCHT AG
POSTFACH 1463
37552 EINBECK
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
P24 X ATX	3151		DEUKWSEIN
P25 X ATX	3152		DEUKWSEIN
P26 X AT3	3154		DEUKWSEIN
P26 X ATX	3153		DEUKWSEIN
P27 X ATX	3155		DEUKWSEIN
P28 X ATX	3156		DEUKWSEIN
P30 X ATX	3157		DEUKWSEIN
P33 X ATX	3158		DEUKWSEIN
P35 X ATX	3159		DEUKWSEIN
P4 X ATX	3131		DEUKWSEIN
P40 X ATX	3160		DEUKWSEIN
P5 X ATX	3132		DEUKWSEIN
P6 X ATX	3133		DEUKWSEIN
P7 X ATX	3134		DEUKWSEIN
P8 X AT3	3136		DEUKWSEIN
P8 X AT4	3137		DEUKWSEIN
P8 X ATX	3135		DEUKWSEIN
P9 X ATX	3138		DEUKWSEIN
PICKETT #3	201		DEUKWSEIN
RED TOP KANDY	47		DEUKWSEIN
ROMA	36		DEUKWSEIN
RTK-EXTRA	48		DEUKWSEIN
SWEET BEE	60		DEUKWSEIN
SX8275 L256	187		DEUKWSEIN
SZARVASI BARNA	199		DEUKWSEIN
THEIS	192		DEUKWSEIN
WHITE COLLIER	200		DEUKWSEIN
WRAY	46		DEUKWSEIN
X1413	3383		DEUKWSEIN
X1414	3381		DEUKWSEIN
X1416	3384		DEUKWSEIN
X1417	3382		DEUKWSEIN
X4001	205		DEUKWSEIN
X4021	206		DEUKWSEIN
X4024	207		DEUKWSEIN
X4025	208		DEUKWSEIN
X4041	209		DEUKWSEIN
X4048	210		DEUKWSEIN
X8180 SW	51		DEUKWSEIN
X8181 SW	52		DEUKWSEIN
ZH 101	377	DEU	DEUKWSEIN
ZH 102	378	DEU	DEUKWSEIN
ZH 103	379	DEU	DEUKWSEIN
ZH 104	380	DEU	DEUKWSEIN
ZH 105	381	DEU	DEUKWSEIN
ZH 106	382	DEU	DEUKWSEIN
ZH 107	383	DEU	DEUKWSEIN
ZH 111	385	DEU	DEUKWSEIN
ZH 114	386	DEU	DEUKWSEIN

KLEINWANZLEBENER SAATZUCHT AG
POSTFACH 1463
37552 EINBECK
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
ZH 116	387	DEU	DEUKWSEIN
ZH 120	388	DEU	DEUKWSEIN
ZH 121	389	DEU	DEUKWSEIN
ZH 122	390	DEU	DEUKWSEIN
ZH 123	391	DEU	DEUKWSEIN
ZH 201	999		DEUKWSEIN
ZH 213	1000		DEUKWSEIN
ZH 243	1001		DEUKWSEIN
ZH 2901	3595		DEUKWSEIN
ZH 2902	3596		DEUKWSEIN
ZH 2903	3597		DEUKWSEIN
ZH 2904	3598		DEUKWSEIN
ZH 2905	3599		DEUKWSEIN
ZH 2906	3600		DEUKWSEIN
ZH 2907	3601		DEUKWSEIN
ZH 2908	3602		DEUKWSEIN
ZH 2909	3603		DEUKWSEIN
ZH 2910	3604		DEUKWSEIN
ZH 2911	3605		DEUKWSEIN
ZH 2912	3606		DEUKWSEIN
ZH 2913	3607		DEUKWSEIN
ZH 2914	3608		DEUKWSEIN
ZH 2915	3609		DEUKWSEIN
ZH 2916	3610		DEUKWSEIN
ZH 2917	3611		DEUKWSEIN
ZH 2918	3612		DEUKWSEIN
ZH 2919	3613		DEUKWSEIN
ZH 2920	3614		DEUKWSEIN
ZH 2921	3615		DEUKWSEIN
ZH 2922	3616		DEUKWSEIN
ZH 2923	3617		DEUKWSEIN
ZH 2924	3618		DEUKWSEIN
ZH 2925	3619		DEUKWSEIN
ZH 2926	3620		DEUKWSEIN
ZH 2927	3621		DEUKWSEIN
ZH 2928	3622		DEUKWSEIN
ZH 2929	3623		DEUKWSEIN
ZH 2930	3624		DEUKWSEIN
ZH 2931	3625		DEUKWSEIN
ZH 2932	3626		DEUKWSEIN
ZH 2933	3627		DEUKWSEIN
ZH 2934	3628		DEUKWSEIN
ZH 2935	3629		DEUKWSEIN
ZH 2936	3630		DEUKWSEIN
ZH 2937	3631		DEUKWSEIN
ZH 2938	3632		DEUKWSEIN
ZH 2939	3633		DEUKWSEIN
ZH 2940	3634		DEUKWSEIN
ZH 2941	3635		DEUKWSEIN

KLEINWANZLEBENER SAATZUCHT AG
POSTFACH 1463
37552 EINBECK
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
ZH 530	1002		DEUKWSEIN
	336		DEUKWSEIN
	337		DEUKWSEIN
	338		DEUKWSEIN
	339		DEUKWSEIN
	340		DEUKWSEIN
	341		DEUKWSEIN
	342		DEUKWSEIN
	343		DEUKWSEIN
	344		DEUKWSEIN
	345		DEUKWSEIN
	346		DEUKWSEIN
	347		DEUKWSEIN
	348		DEUKWSEIN
	349		DEUKWSEIN
	350		DEUKWSEIN
	351		DEUKWSEIN
	352		DEUKWSEIN
	353		DEUKWSEIN
	354		DEUKWSEIN
	355		DEUKWSEIN
	356		DEUKWSEIN
	357		DEUKWSEIN
	358		DEUKWSEIN
	359		DEUKWSEIN
	360		DEUKWSEIN
	361		DEUKWSEIN
	362		DEUKWSEIN
	363		DEUKWSEIN
	364		DEUKWSEIN
	365		DEUKWSEIN
	366		DEUKWSEIN
	367		DEUKWSEIN
	368		DEUKWSEIN
	369		DEUKWSEIN
	370		DEUKWSEIN
	371		DEUKWSEIN
	372		DEUKWSEIN
	373		DEUKWSEIN
	374		DEUKWSEIN
	375		DEUKWSEIN
	376		DEUKWSEIN

KWS-AUSSENSTELLE
SELIGENSTADT B. WUERZBURG
97279 PROSSELSHEIM
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
NRG	53		DEUKWSWUE
RIO	24		DEUKWSWUE
ROX ORANGE INBRED	58		DEUKWSWUE
SUCROSORGE 301	61		DEUKWSWUE
SUCROSORGE 405	49		DEUKWSWUE
T-E-GOLDMAKER	57		DEUKWSWUE

L. C. NUNGESSER GMBH
POSTFACH 110846
64223 DARMSTADT
FEDERAL REPUBLIC OF GERMANY

Genotype	Probno.	Origin Country	Donor
EXPRESS	44		DEUNUNGESDA
H533	43		DEUNUNGESDA
SIOUX	45		DEUNUNGESDA

PLANT GENETIC RESOURCES CENTER OF ETHIOPIA

ADDIS ABABA
ETHIOPIA

Genotype	Probno.	Origin Country	Donor
28-24	157	ETH	ETHPGRC/E
70573	125	ETH	ETHPGRC/E
71822	131	ETH	ETHPGRC/E
71897	132	ETH	ETHPGRC/E
72952	136	ETH	ETHPGRC/E
72984	137	ETH	ETHPGRC/E
73430	140	ETH	ETHPGRC/E
73431	141	ETH	ETHPGRC/E
73479	143	ETH	ETHPGRC/E
73504	144	ETH	ETHPGRC/E
74648	154	ETH	ETHPGRC/E
74832	158	ETH	ETHPGRC/E
74866	159	ETH	ETHPGRC/E
74876	160	ETH	ETHPGRC/E
74884	161	ETH	ETHPGRC/E
ABDULATA	134	ETH	ETHPGRC/E
AFERIE	138	ETH	ETHPGRC/E
BARBARI	164	ETH	ETHPGRC/E
CAPRICORN 1-59-A-7	124	ETH	ETHPGRC/E
CHIBAL	148	ETH	ETHPGRC/E
DEGALIT	153	ETH	ETHPGRC/E
GAMBELA 1107	128	ETH	ETHPGRC/E
HAWAI TINKISH	146	ETH	ETHPGRC/E
JELDE	162	ETH	ETHPGRC/E
KASHMITA	155	ETH	ETHPGRC/E
KEI ZENGADA	133	ETH	ETHPGRC/E
KUKUNE	130	ETH	ETHPGRC/E
MASHILA GEBS	166	ETH	ETHPGRC/E
MISC-11	163	ETH	ETHPGRC/E
METCH KETTETO	139	ETH	ETHPGRC/E
P 183	127	ETH	ETHPGRC/E
RARA	156	ETH	ETHPGRC/E
S-59-B-6	123	ETH	ETHPGRC/E
TINKISH	135	ETH	ETHPGRC/E
TINKISH	142	ETH	ETHPGRC/E
TINKISH	147	ETH	ETHPGRC/E
TINKISH	149	ETH	ETHPGRC/E
TINKISH	152	ETH	ETHPGRC/E
TINKISH GEGEBSA	151	ETH	ETHPGRC/E
TINKISH HAWAI	150	ETH	ETHPGRC/E
WS-1763	165	ETH	ETHPGRC/E
ZENGADA	129	ETH	ETHPGRC/E

ASGROW-FRANCE S.A.
B.P. 80
60304 SENLIS CEDEX
FRANCE

Genotype	Probno.	Origin Country	Donor
OASIS ATN 1977	280		FRAASGROW
QRAZFR ATN 1970	279		FRAASGROW

OFFICE DE LA RECHERCHE SCIENTIFIQUE ET TECHNIQUE OUTRE-MER, SERVICE DES EDITIONS DE L'ORSTOM
70-74 ROUTE D'AULNAY
93140 BONDY
FRANCE

Genotype	Probno.	Origin Country	Donor
SG. 1731	268	SEN	FRAORSBON
SG. 1924	269	SEN	FRAORSBON
SG. 2095	253	NER	FRAORSBON
SG. 2309	254	NER	FRAORSBON
SG. 2327	255	NER	FRAORSBON
SG. 2506	256	NER	FRAORSBON
SG. 2511	257	NER	FRAORSBON
SG. 2528	258	NER	FRAORSBON
SG. 2546	259	NER	FRAORSBON
SG. 2562	260	NER	FRAORSBON
SG. 2565	261	NER	FRAORSBON
SG. 2570	262	NER	FRAORSBON
SG. 3526	270	TGO	FRAORSBON
SG. 3549	271	TGO	FRAORSBON
SG. 3696	272	TGO	FRAORSBON
SG. 3701	273	TGO	FRAORSBON
SG. 4543	248	MLI	FRAORSBON
SG. 4545	249	MLI	FRAORSBON
SG. 4579	250	MLI	FRAORSBON
SG. 4763	251	MLI	FRAORSBON
SG. 4938	252	MLI	FRAORSBON
SG. 6190	263	HVO	FRAORSBON
SG. 6250	264	HVO	FRAORSBON
SG. 6284	265	HVO	FRAORSBON
SG. 6286	266	HVO	FRAORSBON
SG. 7817	267	HVO	FRAORSBON

PROTOSEM DES SEMENCES POUR L'INDUSTRIE, CENTRE DE RECHERCHES
DOMAINE DE CARLES
31340 VILLEMUR
FRANCE

Genotype	Probno.	Origin Country	Donor
H 029	1011	FRA	FRAPROTOSEM
H 030	1012	FRA	FRAPROTOSEM
H 035	1013	FRA	FRAPROTOSEM
H 040	1014	FRA	FRAPROTOSEM
H 043	3640	FRA	FRAPROTOSEM
H 045	1015	FRA	FRAPROTOSEM
H 128	1016	FRA	FRAPROTOSEM
H 129	3641	FRA	FRAPROTOSEM
H 130	3642	FRA	FRAPROTOSEM
H 132	1017	FRA	FRAPROTOSEM
H 133	1018	FRA	FRAPROTOSEM
H 143	1019	FRA	FRAPROTOSEM
H 173	1020	FRA	FRAPROTOSEM
H 174	1021	FRA	FRAPROTOSEM
H 178	1022	FRA	FRAPROTOSEM
H 200	3643	FRA	FRAPROTOSEM
H 201	3644	FRA	FRAPROTOSEM
H 234	3655	FRA	FRAPROTOSEM
H 252	3645	FRA	FRAPROTOSEM
H 266	3646	FRA	FRAPROTOSEM
H 269	3647	FRA	FRAPROTOSEM
H 341	3649	FRA	FRAPROTOSEM
HP 267	3650	FRA	FRAPROTOSEM
HS 01	3652	FRA	FRAPROTOSEM
HS 02	3651	FRA	FRAPROTOSEM
HS 04	3654	FRA	FRAPROTOSEM
HS 04	3654	FRA	FRAPROTOSEM
HS 09	3653	FRA	FRAPROTOSEM

TOURNEUR FRERES, SA
64, RUE DE GENERAL LECLERC
77120 COULOMMIERS
FRANCE

Genotype	Probno.	Origin Country	Donor
SWEET SIOUX	11		FRAT1
TESA	10		FRAT1
TRUDEX	12		FRAT1

NATIONAL INSTITUTE FOR AGRICULTURAL VARIETY TESTING, RESEARCH CENTRE FOR AGOBOTANY

2766 TAPIOSZELE
HUNGARY

Genotype	Probno.	Origin Country	Donor
CANE AMBER	167		HUNRCA
COLMAN	3397		HUNRCA
DINDERRAVEN	173	NGA	HUNRCA
EARLY AMBER	174		HUNRCA
HUAN-LO-SON NR. 1	172	CHL	HUNRCA
KUNSAGI 460	62		HUNRCA
MINNESOTA AMBER	171		HUNRCA
QUERI 8	3396		HUNRCA
TAPIO	63		HUNRCA
TAPIO X HONEY	168		HUNRCA
WACONIA ORANGE CANE	170	USA	HUNRCA

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

HYDERABAD
INDIA

Genotype	Probno.	Origin Country	Donor
84-S-130	3407		INDICRISAT
84-S-130-2	3405		INDICRISAT
A (ATLAS) • BRANDES	910		INDICRISAT
A (ATLAS) • HEGARI	922		INDICRISAT
A (ATLAS) • RIO	917		INDICRISAT
A (ATLAS) • SART	911		INDICRISAT
A (ATLAS) • WRAY	920		INDICRISAT
A 1388 • RIO	901		INDICRISAT
A 1388 • TMT • 430	927		INDICRISAT
A 155 • E35-1	902		INDICRISAT
A 160 • E35-1	903		INDICRISAT
ATX 623 • BMR 12	900		INDICRISAT
ATX 623 • CHINASORG	896		INDICRISAT
ATX 623 • GREENLEAF	894		INDICRISAT
ATX 623 • KELLER	923		INDICRISAT
ATX 623 • MN 1500	925		INDICRISAT
ICSV-91001	3411		INDICRISAT
ICSV-91003	3406		INDICRISAT
IS 00112	449		INDICRISAT
IS 00113	450		INDICRISAT
IS 00121	451		INDICRISAT
IS 00131	600		INDICRISAT
IS 00271	601		INDICRISAT
IS 01096	452		INDICRISAT
IS 01347	453		INDICRISAT
IS 02331	602		INDICRISAT
IS 02525	603		INDICRISAT
IS 02874	454		INDICRISAT
IS 03285	550	IND	INDICRISAT
IS 03491	455		INDICRISAT
IS 03511	456		INDICRISAT
IS 03513	457		INDICRISAT
IS 03515	458		INDICRISAT
IS 03524	604		INDICRISAT
IS 03552	605		INDICRISAT
IS 03556	606		INDICRISAT
IS 03569	607		INDICRISAT
IS 03572	608		INDICRISAT
IS 03615	551	IND	INDICRISAT
IS 03701	552	IND	INDICRISAT
IS 03743	553	IND	INDICRISAT
IS 03829	554	IND	INDICRISAT
IS 03898	459		INDICRISAT
IS 04088	555	IND	INDICRISAT
IS 04322	556	IND	INDICRISAT
IS 04617	609		INDICRISAT
IS 04751	610		INDICRISAT
IS 04755	611		INDICRISAT
IS 04861	557	LBN	INDICRISAT

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

HYDERABAD
INDIA

Genotype	Probno.	Origin Country	Donor
IS 04922	558	NGA	INDICRISAT
IS 04938	559	UGA	INDICRISAT
IS 05067	460		INDICRISAT
IS 05089	560	NGA	INDICRISAT
IS 05226	561	NER	INDICRISAT
IS 05350	562	NER	INDICRISAT
IS 05356	563	NER	INDICRISAT
IS 05466	564	NER	INDICRISAT
IS 05539	565	NER	INDICRISAT
IS 06102	566	NER	INDICRISAT
IS 06112	567	NER	INDICRISAT
IS 06146	568	CMR	INDICRISAT
IS 06271	569	MLI	INDICRISAT
IS 06335	570	MLI	INDICRISAT
IS 06419	571	MLI	INDICRISAT
IS 06612	572	MWI	INDICRISAT
IS 06764	573	MWI	INDICRISAT
IS 06936	612		INDICRISAT
IS 06962	613		INDICRISAT
IS 06964	574	IND	INDICRISAT
IS 06973	614		INDICRISAT
IS 07073	615		INDICRISAT
IS 07077	616		INDICRISAT
IS 07080	617		INDICRISAT
IS 07305	461		INDICRISAT
IS 07320	462		INDICRISAT
IS 07330	575	IND	INDICRISAT
IS 07683	463		INDICRISAT
IS 07720	464		INDICRISAT
IS 08157	618		INDICRISAT
IS 08218	619		INDICRISAT
IS 08344	465		INDICRISAT
IS 08402	576	NGA	INDICRISAT
IS 08534	577	IND	INDICRISAT
IS 08544	466		INDICRISAT
IS 08551	578	IND	INDICRISAT
IS 08596	579	IND	INDICRISAT
IS 08662	467		INDICRISAT
IS 08753	580	BWA	INDICRISAT
IS 08949	581	TGO	INDICRISAT
IS 08953	582	TGO	INDICRISAT
IS 08955	583	TGO	INDICRISAT
IS 08961	584	TGO	INDICRISAT
IS 08963	585	TGO	INDICRISAT
IS 09110	586	IND	INDICRISAT
IS 09116	587	IND	INDICRISAT
IS 09118	588	IND	INDICRISAT
IS 09120	589	IND	INDICRISAT
IS 09259	590	TGO	INDICRISAT

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

HYDERABAD
INDIA

Genotype	Probno.	Origin Country	Donor
IS 09268	591	TGO	INDICRISAT
IS 09282	592	TGO	INDICRISAT
IS 09347	593	GHA	INDICRISAT
IS 09388	594	GHA	INDICRISAT
IS 09401	595	GHA	INDICRISAT
IS 09404	596	GHA	INDICRISAT
IS 09426	597	GHA	INDICRISAT
IS 09455	598	GHA	INDICRISAT
IS 09456	599	GHA	INDICRISAT
IS 09638	620		INDICRISAT
IS 09639	621		INDICRISAT
IS 09645	622		INDICRISAT
IS 09699	623		INDICRISAT
IS 09705	624		INDICRISAT
IS 09708	468		INDICRISAT
IS 09734	625		INDICRISAT
IS 09761	469		INDICRISAT
IS 09767	626		INDICRISAT
IS 09889	627		INDICRISAT
IS 09890	628		INDICRISAT
IS 09901	629		INDICRISAT
IS 09911	630		INDICRISAT
IS 10050	631		INDICRISAT
IS 10690	632		INDICRISAT
IS 10954	633		INDICRISAT
IS 11093	634		INDICRISAT
IS 11167	470		INDICRISAT
IS 11496	635		INDICRISAT
IS 12292	636		INDICRISAT
IS 12736	471		INDICRISAT
IS 12737	472		INDICRISAT
IS 12739	473		INDICRISAT
IS 12740	474		INDICRISAT
IS 12741	475		INDICRISAT
IS 12743	476		INDICRISAT
IS 12744	477		INDICRISAT
IS 13435	478		INDICRISAT
IS 13437	479		INDICRISAT
IS 13444	480		INDICRISAT
IS 13446	481		INDICRISAT
IS 13448	482		INDICRISAT
IS 13639	637		INDICRISAT
IS 13802	483		INDICRISAT
IS 14446	638		INDICRISAT
IS 14463	639		INDICRISAT
IS 14529	640		INDICRISAT
IS 14548	641		INDICRISAT
IS 14594	642		INDICRISAT
IS 14790	643		INDICRISAT

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

HYDERABAD
INDIA

Genotype	Probno.	Origin Country	Donor
IS 14904	644		INDICRISAT
IS 14942	645		INDICRISAT
IS 14960	646		INDICRISAT
IS 15102	647		INDICRISAT
IS 15428	648		INDICRISAT
IS 15448	649		INDICRISAT
IS 15455	650		INDICRISAT
IS 16054	651		INDICRISAT
IS 17595	484		INDICRISAT
IS 17601	485		INDICRISAT
IS 17605	486		INDICRISAT
IS 18463	487		INDICRISAT
IS 18465	488		INDICRISAT
IS 18467	489		INDICRISAT
IS 18484	490		INDICRISAT
IS 19107	652		INDICRISAT
IS 19130	653		INDICRISAT
IS 19214	654		INDICRISAT
IS 19261	655		INDICRISAT
IS 19273	656		INDICRISAT
IS 19587	657		INDICRISAT
IS 20503	658		INDICRISAT
IS 20510	659		INDICRISAT
IS 20557	660		INDICRISAT
IS 20583	661		INDICRISAT
IS 20888	662		INDICRISAT
IS 20962	663		INDICRISAT
IS 20963	664		INDICRISAT
IS 20965	491		INDICRISAT
IS 20969	492		INDICRISAT
IS 20974	665		INDICRISAT
IS 20984	666		INDICRISAT
IS 21005	667		INDICRISAT
IS 21023	668		INDICRISAT
IS 21100	669		INDICRISAT
IS 21229	670		INDICRISAT
IS 21235	671		INDICRISAT
IS 21260	672		INDICRISAT
IS 21436	493		INDICRISAT
IS 21479	494		INDICRISAT
IS 21991	673		INDICRISAT
IS 22064	495		INDICRISAT
IS 22070	496		INDICRISAT
IS 22236	497		INDICRISAT
IS 22270	506	BWA	INDICRISAT
IS 22291	498		INDICRISAT
IS 22299	507	BWA	INDICRISAT
IS 22307	508	BWA	INDICRISAT
IS 22308	509	BWA	INDICRISAT

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

HYDERABAD
INDIA

Genotype	Probno.	Origin Country	Donor
IS 22312	499		INDICRISAT
IS 22314	510	BWA	INDICRISAT
IS 22315	511	BWA	INDICRISAT
IS 22316	512	BWA	INDICRISAT
IS 22353	513	BWA	INDICRISAT
IS 22374	514	SDN	INDICRISAT
IS 22375	515	SDN	INDICRISAT
IS 22380	500		INDICRISAT
IS 22382	516	SDN	INDICRISAT
IS 22399	517	SDN	INDICRISAT
IS 22400	518	SDN	INDICRISAT
IS 22422	519	SDN	INDICRISAT
IS 22426	520	SDN	INDICRISAT
IS 22451	521	SDN	INDICRISAT
IS 22471	522	SDN	INDICRISAT
IS 22472	523	SDN	INDICRISAT
IS 22473	524	SDN	INDICRISAT
IS 22474	525	SDN	INDICRISAT
IS 22475	526	SDN	INDICRISAT
IS 22476	527	SDN	INDICRISAT
IS 22477	528	SDN	INDICRISAT
IS 22478	529	SDN	INDICRISAT
IS 22479	530	SDN	INDICRISAT
IS 22481	531	SDN	INDICRISAT
IS 22636	674		INDICRISAT
IS 22682	501		INDICRISAT
IS 22795	502		INDICRISAT
IS 23619	503		INDICRISAT
IS 23687	504		INDICRISAT
IS M-32-1	505		INDICRISAT
IS-18456	3410		INDICRISAT
IS-22144	3408		INDICRISAT
IS-4776	3412		INDICRISAT
MER 79-01	830		INDICRISAT
MER 80-04	834		INDICRISAT
MER 80-06	836		INDICRISAT
MER 80-07	837		INDICRISAT
MER 80-08	838		INDICRISAT
MER 80-09	839		INDICRISAT
MER 80-10	840		INDICRISAT
MER 80-11	841		INDICRISAT
MER 80-13	842		INDICRISAT
MER 81-02	845		INDICRISAT
MER 81-02	887		INDICRISAT
MER 81-03	846		INDICRISAT
MER 81-04	847		INDICRISAT
MER 81-05	848		INDICRISAT
MER 81-06	849		INDICRISAT
MER 81-08	851		INDICRISAT

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

HYDERABAD
INDIA

Genotype	Probno.	Origin Country	Donor
MER 81-09	852		INDICRISAT
MER 81-10	853		INDICRISAT
MER 81-12	855		INDICRISAT
MER 82-01	856		INDICRISAT
MER 82-05	860		INDICRISAT
MER 82-06	861		INDICRISAT
MER 82-08	863		INDICRISAT
MER 82-10	865		INDICRISAT
MER 82-11	866		INDICRISAT
MER 82-13	868		INDICRISAT
MER 82-14	869		INDICRISAT
MER 82-15	870		INDICRISAT
MER 82-17	872		INDICRISAT
MER 82-19	874		INDICRISAT
MER 82-20	875		INDICRISAT
MER 82-21	876		INDICRISAT
MN 1	778		INDICRISAT
MN 2	779		INDICRISAT
MN 3	780		INDICRISAT
MN 5	781		INDICRISAT
MN 6	782		INDICRISAT
MN 7	783		INDICRISAT
MN 8	784		INDICRISAT
MN 9	785		INDICRISAT
MN 10	786		INDICRISAT
MN 1048	919		INDICRISAT
MN 1056	921		INDICRISAT
MN 11	787		INDICRISAT
MN 12	788		INDICRISAT
MN 13	789		INDICRISAT
MN 14	790		INDICRISAT
MN 1500	890		INDICRISAT
MN 16	792		INDICRISAT
MN 18	794		INDICRISAT
MN 20	796		INDICRISAT
MN 23	799		INDICRISAT
MN 24	800		INDICRISAT
MN 25	801		INDICRISAT
MN 28	804		INDICRISAT
MN 30	806		INDICRISAT
MN 31	807		INDICRISAT
MN 32	808		INDICRISAT
MN 33	809		INDICRISAT
MN 36	812		INDICRISAT
MN 40	815		INDICRISAT
MN 42	817		INDICRISAT
MN 46	820		INDICRISAT
MN 48	822		INDICRISAT
MN 49	823		INDICRISAT

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT)

HYDERABAD
INDIA

Genotype	Probno.	Origin Country	Donor
MN 50	824		INDICRISAT
MN 55	828		INDICRISAT
MN 58	829		INDICRISAT
MN 960	914		INDICRISAT
PA-12	532	CMR	INDICRISAT
PA-46	533	CMR	INDICRISAT
PA-46-31	534	CMR	INDICRISAT
PA-56	535	CMR	INDICRISAT
PA-56-25	536	CMR	INDICRISAT
PA-57	537	CMR	INDICRISAT
PA-57-24	538	CMR	INDICRISAT
PA-60-21	539	CMR	INDICRISAT
PA-61-20	540	CMR	INDICRISAT
PA-62-19	541	CMR	INDICRISAT
PA-65	542	CMR	INDICRISAT
PA-69	543	CMR	INDICRISAT
PA-69-12	544	CMR	INDICRISAT
PA-70	545	CMR	INDICRISAT
PA-71-10	546	CMR	INDICRISAT
PA-75-6	547	CMR	INDICRISAT
PA-79	548	CMR	INDICRISAT
PA-79-2	549	CMR	INDICRISAT
RQV 84-26	879		INDICRISAT
RQV 84-34	885		INDICRISAT
RQV 84-82	880		INDICRISAT
SART	907		INDICRISAT
SSV-108	3409		INDICRISAT
SWEET SIOUX IV	886		INDICRISAT

BIOTEC, A., AGRICULTURA BIOTECHNOLOGIE SEDE AMMINISTRATIVA

VIALE G. MATTEOTTI 115
47100 FORLI
ITALY

Genotype	Probno.	Origin Country	Donor
93183	1009		ITABIOTEC
93187	1010		ITABIOTEC
93325	1012		ITABIOTEC
93337	1013		ITABIOTEC
93437	1011		ITABIOTEC
CC 270	3390		ITABIOTEC
CC 280	3392		ITABIOTEC
CC 489	3393		ITABIOTEC
CC 627	3394		ITABIOTEC
H 29	1024	ITA	ITABIOTEC
IS 10954	1005		ITABIOTEC
IS 14594	1006		ITABIOTEC
IS 14942	1007		ITABIOTEC
IS 15102	1008		ITABIOTEC
IS 9705	1004		ITABIOTEC
NK 506	1023	ITA	ITABIOTEC

ISTITUTO SPERIMENTALE PER LE COLTURE FORAGGERE

VIA NAPOLI 52
FOGGIA
ITALY

Genotype	Probno.	Origin Country	Donor
GEKA	285		ITAI7
ROCE	288		ITAI7
ROMAGUOLO	290		ITAI7
SIVOI	289		ITAI7
SOAVE	286		ITAI7
VESPA	287		ITAI7

GERMPLASM INSTITUTE

VIA G.AMENDOLA 165 A
70126 BARI
ITALY

Genotype	Probno.	Origin Country	Donor
90502	3415		ITAIDG
90957	3416		ITAIDG
90966	3417		ITAIDG
90983	3419		ITAIDG
90986	3420		ITAIDG
92942	3423		ITAIDG

NATIONAL INSTITUTE OF AGROBIOLOGICAL RESOURCES

YATABE ISUKUBA IBARAKI 305
JAPAN

Genotype	Probno.	Origin Country	Donor
AKA AMAKIBI	412	JPN	JPNNIAR
AKAHO	417	JPN	JPNNIAR
HOUKI	413	JPN	JPNNIAR
KOKUSHOKU ZAIRAISHU	411	JPN	JPNNIAR
KURAVASE	415	JPN	JPNNIAR
MOROKOSHI	416	JPN	JPNNIAR
NAKARZYOO ZAIRAI	420	JPN	JPNNIAR
SEKISHOKU ZAIRAISHU	419	JPN	JPNNIAR
TAKAKIBI	418	JPN	JPNNIAR
ZAIRAISHU	414	JPN	JPNNIAR
ZAIRAISHU IWAOKA	421	JPN	JPNNIAR

RESEARCH INSTITUTE FOR CEREALS AND INDUSTRIAL CROPS

JUD. CALARASI
8264 FUNDULEA
RUMANIA

Genotype	Probno.	Origin Country	Donor
FUNDULEA 107-1/83	71		ROMICCPT
FUNDULEA 215/82	224	ROM	ROMICCPT
FUNDULEA 215/83	73		ROMICCPT
FUNDULEA 7323/83	72		ROMICCPT

THE N.I. VAVILOV ALL-RUSSIAN SCIENTIFIC RESEARCH INSTITUTE OF PLANT GENETIC RESOURCES

44, BOLSHAYA MORSKAYA ST.
19000 ST. PETERSBURG
UNION OF SOVIET SOCIALIST REPUBLICS

Genotype	Probno.	Origin Country	Donor
290 SUMAK RANNIJ	75	USA	SUNWIR
337 JANTAR CHERNYJ	76	FRA	SUNWIR
343 SUMAK	77	USA	SUNWIR
731 ORANZEVOE	80	MEX	SUNWIR
BARBUDA	296	UGA	SUNWIR
BLACK AMBER	298	ZAF	SUNWIR
CANE BLACK AMBER	291	USA	SUNWIR
ERALI ORANGE SORGHUM	179	M-AMERIK	SUNWIR
ESLAND (FORAGE)	303	ZAF	SUNWIR
I-472787 ADO'CS	228	HUN	SUNWIR
I-472788 BALATONCSICSO'	229	HUN	SUNWIR
I-472795 NYIRESYHA'ZA	230	HUN	SUNWIR
I062 JANTAR RANNIJ	81	SUN	SUNWIR
I375 CRANZEVOE	83	M-AMERIK	SUNWIR
I43 JANTAR CHERNYI	74	USA	SUNWIR
JANTAR KRASNYJ 271/585	300	SUN	SUNWIR
JANTAR SLADKIJ 84/327	299	SUN	SUNWIR
K-9234	225	DDR	SUNWIR
K-9235	226	DDR	SUNWIR
K-9236	227	DDR	SUNWIR
LEOTI RED SORGO	79	USA	SUNWIR
MEDOVOJE	82	SUN	SUNWIR
ORANGE CANE	293	USA	SUNWIR
ORANZEVOJE 160	297	SUN	SUNWIR
PEPPARD'S SOURLESS	292	USA	SUNWIR
RED AMBER	78	USA	SUNWIR
RED TOP	177	USA	SUNWIR
ROOI AMBER	302	ZAF	SUNWIR
SORGO	176	SUN	SUNWIR
SORGO	295	SUN	SUNWIR
SORGO CANDAAZUCAR	184	MEX	SUNWIR
SORGO MEDOVOJE	183	SUN	SUNWIR
SORGO SAHARNOJI	182	USA	SUNWIR
SORGO SUCRE	181	FRA	SUNWIR
SUMAK SORGO	180	USA	SUNWIR
UTAVLI	301	IND	SUNWIR
WACONIA AMBER	294	USA	SUNWIR

KASETSART UNIVERSITY, FACULTY OF AGRICULTURE, DEPT. OF AGRICULTURE, CAMPHAENGSAEN CAMPUS

NAKORNPRATHOM
THAILAND

Genotype	Probno.	Origin Country	Donor
RAMADA	37		THAKU

PLANT GENETIC RESOURCES RESEARCH INSTITUTE
P.O. BOX 9 MENEMEN
IZMIR 35661
TURKEY

Genotype	Probno.	Origin Country	Donor
(266 X 3871) X 1023	101		TURPGRRI
(635 X 3135) X 858	94		TURPGRRI
(635 X 3135) X 858	113		TURPGRRI
(648 X 3869) X 635	107		TURPGRRI
(648 X 3869) X 635-A	93		TURPGRRI
(688 X 3135) X 858	95		TURPGRRI
(688 X TUB7) X 1023	106		TURPGRRI
1642	110		TURPGRRI
1683	89		TURPGRRI
1742 X 1414	109		TURPGRRI
1742 X 1416	105		TURPGRRI
50 X 846	112		TURPGRRI
635 X 1836	98		TURPGRRI
642	111		TURPGRRI
658 X OP. ST.	103		TURPGRRI
8525	96		TURPGRRI
AKSU-78	114		TURPGRRI
GUEZOE-80	115		TURPGRRI
IS 12329	102		TURPGRRI
IS 12329-A	100		TURPGRRI
MES 227 X 27	91		TURPGRRI
MK SORDOM 70	108		TURPGRRI
OP. ST.	90		TURPGRRI
P.721 X 266-A	92		TURPGRRI
TR 37108	407	TUR	TURPGRRI
TR 37514	410	TUR	TURPGRRI
TR 37528	394	TUR	TURPGRRI
TR 37537	393	TUR	TURPGRRI
TR 37560	395	TUR	TURPGRRI
TR 37561	392	TUR	TURPGRRI
TR 37562	406	TUR	TURPGRRI
TR 37563	397	TUR	TURPGRRI
TR 37564	396	TUR	TURPGRRI
TR 37565	399	TUR	TURPGRRI
TR 38266	408	TUR	TURPGRRI
TR 38322	409	TUR	TURPGRRI
TR 39300	398	TUR	TURPGRRI
TR 39301	401	TUR	TURPGRRI
TR 39302	400	TUR	TURPGRRI
TR 39305	404	TUR	TURPGRRI
TR 39306	405	TUR	TURPGRRI
TR 39713	403	TUR	TURPGRRI
TR 39722	402	TUR	TURPGRRI
TUB7 X 846	104		TURPGRRI

GROAGRI SEED COMPANY
P.O. BOX 1656
LUBBOCK/TEXAS 79408
UNITED STATE OF AMERICA

Genotype	Probno.	Origin Country	Donor
FS-4	276		USAGSC
FS-5	277		USAGSC
GSA 1586F	274		USAGSC
GSA 1757	275		USAGSC
ST-6+	278		USAGSC

TEXAS A AND M UNIVERSITY, DEPT. OF SOIL AND CROP SCIENCES, COLLEGE STATION, (FRED MILLER)

TEXAS 77843
UNITED STATE OF AMERICA

Genotype	Probno.	Origin Country	Donor
A ATLAS X BMR-12	238		USATAM2
A ATLAS X P.3	237		USATAM2
A ATLAS X RIO	31		USATAM2
A ATLAS X RT X 430	32		USATAM2
A ATLAS X RT X 432	239		USATAM2
AT X 623 X 77C53	246		USATAM2
AT X 623 X BMR-12	242		USATAM2
AT X 623 X CS 3541	29		USATAM2
AT X 623 X GREENLEAF	244		USATAM2
AT X 623 X HEGARI	245		USATAM2
AT X 623 X KELLER	243		USATAM2
AT X 623 X P-3	240		USATAM2
AT X 623 X RIO	28		USATAM2
AT X 623 X RT X 430	30		USATAM2
AT X 623 X RT X 432	241		USATAM2
ATLAS	34		USATAM2
BRANDES	33		USATAM2
BT X 623	35		USATAM2
COWLEY	234		USATAM2
FUNTES 1990	247		USATAM2
HEGARI	235		USATAM2
KELLER	26		USATAM2
M81E	27		USATAM2
MER 80-10	231		USATAM2
MER 81-2	232		USATAM2
MN 1500	233		USATAM2
TEXAS	70		USATAM2

TAYLOR-EVANS SEED CO.
P.O. BOX.68
TULIA/TEXAS 79088
UNITED STATE OF AMERICA

Genotype	Probno.	Origin Country	Donor
ROX ORANGE	284		USATES
T-E MILKMAKER-T	282		USATES
T-E SILOMAKER	281		USATES
T-E YIELDMAKER	283		USATES

REGIONAL PLANT INTRODUCTION STATION, EXPERIMENT / GEORGIA

GEORGIA
UNITED STATE OF AMERICA

Genotype	Probno.	Origin Country	Donor
MN 1048	18		USAUS4
MN 14	15		USAUS4
MN 1555	19		USAUS4
MN 2798	20		USAUS4
MN 3808	21		USAUS4
MN 4059	22		USAUS4
MN 4182	23		USAUS4
MN 71-7	16		USAUS4
MN 872	17		USAUS4

GERMPLASM RESOURCES LABORATORY
BLD.001, ROOM 322, BARC
BELTSVILLE/MARYLAND 20705
UNITED STATE OF AMERICA

Genotype	Probno.	Origin Country	Donor
73-7	126		USAUSDA1
MER 74-8	145		USAUSDA1
MER 75-10	185		USAUSDA1
MER 78-13	186		USAUSDA1

DIVISION OF PLANT AND SEED CONTROL, THE PLANT INTRODUCTION OFFICER
PRIVATE BAG X293
PRETORIA 0001
REPUBLIC OF SOUTH AFRICA

Genotype	Probno.	Origin Country	Donor
82055	40		ZAFDPSC
82141	41		ZAFDPSC
82142	42		ZAFDPSC
ADVANCE	445		ZAFDPSC
BLACK AMBER	435		ZAFDPSC
CLUBDAY	433		ZAFDPSC
DON SALVADOR	446		ZAFDPSC
GREENLEAF	444		ZAFDPSC
HAAKDORING	122		ZAFDPSC
LA HOMA	440		ZAFDPSC
LA HOMA	447		ZAFDPSC
LOCAL COLLECTION	448		ZAFDPSC
PIPER	442		ZAFDPSC
RED AMBER	436		ZAFDPSC
SA 01	3435		ZAFDPSC
SA 05	3436		ZAFDPSC
SA 07	3437		ZAFDPSC
SA 076	3471	ZAF	ZAFDPSC
SA 08	3438		ZAFDPSC
SA 081	3473	ZAF	ZAFDPSC
SA 086	3474	ZAF	ZAFDPSC
SA 088	3475	ZAF	ZAFDPSC
SA 09	3439		ZAFDPSC
SA 096	3476	ZAF	ZAFDPSC
SA 10	3440		ZAFDPSC
SA 100	3477	ZAF	ZAFDPSC
SA 109	3478	ZAF	ZAFDPSC
SA 110	3479	ZAF	ZAFDPSC
SA 112	3480	ZAF	ZAFDPSC
SA 113	3481	ZAF	ZAFDPSC
SA 114	3482	ZAF	ZAFDPSC
SA 116	3483	ZAF	ZAFDPSC
SA 117	3484	ZAF	ZAFDPSC
SA 119	3485	ZAF	ZAFDPSC
SA 12	3441		ZAFDPSC
SA 120	3486	ZAF	ZAFDPSC
SA 122	3487	ZAF	ZAFDPSC
SA 124	3488	ZAF	ZAFDPSC
SA 125	3489	ZAF	ZAFDPSC
SA 128	3490	ZAF	ZAFDPSC
SA 131	3491	ZAF	ZAFDPSC
SA 136	3493	ZAF	ZAFDPSC
SA 137	3494	ZAF	ZAFDPSC
SA 138	3495	ZAF	ZAFDPSC
SA 140	3496	ZAF	ZAFDPSC
SA 142	3497	ZAF	ZAFDPSC
SA 144	3498	ZAF	ZAFDPSC
SA 145	3499	ZAF	ZAFDPSC
SA 146	3500	ZAF	ZAFDPSC

DIVISION OF PLANT AND SEED CONTROL, THE PLANT INTRODUCTION OFFICER
PRIVATE BAG X293
PRETORIA 0001
REPUBLIC OF SOUTH AFRICA

Genotype	Probno.	Origin Country	Donor
SA 147	3501	ZAF	ZAFDPSC
SA 148	3502	ZAF	ZAFDPSC
SA 15	3442		ZAFDPSC
SA 151	3503	ZAF	ZAFDPSC
SA 157	3504	ZAF	ZAFDPSC
SA 16	3443		ZAFDPSC
SA 161	3505	ZAF	ZAFDPSC
SA 170	3506	ZAF	ZAFDPSC
SA 176	3507	ZAF	ZAFDPSC
SA 177	3508	ZAF	ZAFDPSC
SA 179	3509	ZAF	ZAFDPSC
SA 18	3444		ZAFDPSC
SA 186	3510	ZAF	ZAFDPSC
SA 19	3445		ZAFDPSC
SA 190	3512	ZAF	ZAFDPSC
SA 20	3446		ZAFDPSC
SA 201	3513	ZAF	ZAFDPSC
SA 204	3514	ZAF	ZAFDPSC
SA 21	3447		ZAFDPSC
SA 210	3515	ZAF	ZAFDPSC
SA 217	3516	ZAF	ZAFDPSC
SA 221	3517	ZAF	ZAFDPSC
SA 227	3518	ZAF	ZAFDPSC
SA 234	3519	ZAF	ZAFDPSC
SA 24	3448		ZAFDPSC
SA 241	3520	ZAF	ZAFDPSC
SA 243	3521	ZAF	ZAFDPSC
SA 247	3522	ZAF	ZAFDPSC
SA 25	3449		ZAFDPSC
SA 267	3523	ZAF	ZAFDPSC
SA 271	3524	ZAF	ZAFDPSC
SA 28	3450		ZAFDPSC
SA 283	3525	ZAF	ZAFDPSC
SA 285	3526	ZAF	ZAFDPSC
SA 287	3527	ZAF	ZAFDPSC
SA 290	3528	ZAF	ZAFDPSC
SA 293	3529	ZAF	ZAFDPSC
SA 295	3530	ZAF	ZAFDPSC
SA 297	3531	ZAF	ZAFDPSC
SA 30	3451		ZAFDPSC
SA 307	3532	ZAF	ZAFDPSC
SA 308	3533	ZAF	ZAFDPSC
SA 31	3452		ZAFDPSC
SA 318	3534	ZAF	ZAFDPSC
SA 32	3453		ZAFDPSC
SA 321	3535	ZAF	ZAFDPSC
SA 326	3536	ZAF	ZAFDPSC
SA 33	3454		ZAFDPSC
SA 34	3455		ZAFDPSC

DIVISION OF PLANT AND SEED CONTROL, THE PLANT INTRODUCTION OFFICER
PRIVATE BAG X293
PRETORIA 0001
REPUBLIC OF SOUTH AFRICA

Genotype	Probno.	Origin Country	Donor
SA 341	3537	ZAF	ZAFDPSC
SA 349	3538	ZAF	ZAFDPSC
SA 362	3541	ZAF	ZAFDPSC
SA 365	3542	ZAF	ZAFDPSC
SA 37	3456		ZAFDPSC
SA 39	3457		ZAFDPSC
SA 416	3543	ZAF	ZAFDPSC
SA 44	3458		ZAFDPSC
SA 45	3459		ZAFDPSC
SA 458	3544	ZAF	ZAFDPSC
SA 483	3545	ZAF	ZAFDPSC
SA 49	3460		ZAFDPSC
SA 50	3461		ZAFDPSC
SA 51	3462		ZAFDPSC
SA 520	3546	ZAF	ZAFDPSC
SA 53	3463		ZAFDPSC
SA 55	3464		ZAFDPSC
SA 568	3547	ZAF	ZAFDPSC
SA 569	3548	ZAF	ZAFDPSC
SA 571	3549	ZAF	ZAFDPSC
SA 575	3550	ZAF	ZAFDPSC
SA 576	3551	ZAF	ZAFDPSC
SA 581	3552	ZAF	ZAFDPSC
SA 587	3553	ZAF	ZAFDPSC
SA 589	3554	ZAF	ZAFDPSC
SA 59	3465		ZAFDPSC
SA 590	3555	ZAF	ZAFDPSC
SA 590	3555	ZAF	ZAFDPSC
SA 61	3466		ZAFDPSC
SA 62	3467		ZAFDPSC
SA 64	3468		ZAFDPSC
SA 67	3469		ZAFDPSC
SOETRIET	438		ZAFDPSC
SOONER	434		ZAFDPSC
SUGARCANE	437		ZAFDPSC
SUGARDRIP	431		ZAFDPSC
SUHI I	439		ZAFDPSC
SWEET 372	441		ZAFDPSC
SWEET SUDAN	432		ZAFDPSC
TRIFT	443		ZAFDPSC

UNITED STATE OF AMERICA

Genotype	Probno.	Origin Country	Donor
612 F	310		USAHOOPER, NEBRASKA

Genotype	Probno.	Origin Country	Donor
614 F	309 55		HOEGEMEYER HYBR. INC

10. Annex 3

Database collection of 10 years of sorghum field trial evaluations (1985 - 1995)

Evaluation Data of Sorghum bicolor from 1985-1995

Institute of Crop Science
Federal Research Centre for Agriculture Braunschweig-Völkenrode (FAL)
Bundesallee 50, D-38116 Braunschweig
Federal Republic of Germany
Tel. 0531-5961, Fax. 0531-596 365

NO	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
10	TESA	576.0	167.6	5.7	32.9	1.0	0.8	3.9		29.1	240	5		7		7			5	1985
10	TESA	589.0	179.5	5.8	34.3	1.9	1.5	2.4	23.4	30.5	244	1		6	2	8	5	5	1	1986
10	TESA	541.2	154.0	6.7	36.4	0.9	0.7	5.1		28.5	251	1	8	3	1	9	3	3	3	1992
11	SWEET SIOUX	894.0	204.3	5.0	44.3	1.4	1.0	2.5		22.9	200	7		3		7			1	1985
11	SWEET SIOUX	814.0	199.0	8.1	65.9	1.8	1.3	4.9	17.4	24.5	219	5		5	1	7	3	2	1	1986
11	SWEET SIOUX	1425.0	306.2	6.4	91.2	2.7	2.2	1.4		21.5	224	7	9	2	1	8	1		1	1987
12	TRUDEX	584.0	159.1	4.5	26.3	1.0	0.8	2.8		27.3	200	7		7		9			1	1985
12	TRUDEX	429.0	137.1	6.1	26.1	1.6	1.4	3.1	19.3	32.0	223	1		6	1	9	3	2	1	1986
13	SORSA	404.0	120.2	5.3	21.6	1.9	1.1	2.4		29.8	220	3		7		7			5	1985
13	SORSA	435.0	154.9	6.1	26.7	2.0	1.5	2.7	27.6	35.6	291	1		4	1	7	4	4	1	1986
13	SORSA	445.7	158.7	4.3	19.2	0.9	0.6	2.8		35.6	260	1	8	3	1	9	2	3	3	1992
15	HH 14	275.0	50.3	5.5	15.0	2.4	1.4	1.7		18.3	120			9		5			1	1985
16	HH 71-7	247.0	55.3							22.4	100			5		7			1	1985
17	HH 872	133.0	35.4	7.3	9.7	1.6	0.9	4.8		26.6	90	9		7		5			1	1985
18	HH 1048	378.0	117.6	8.1	30.7	1.4	0.9	5.9		31.1	140			9		9			1	1985
19	HH 1555	400.0	78.6	2.4	9.6	1.3	0.9	0.3		19.7	130			9		5			1	1985
20	HH 2798	382.0	93.6	4.8	18.4	1.5	0.9	2.4		24.5	120			9		9			1	1985
21	HH 3808	327.0	89.9	8.9	29.1	2.6	1.4	5.0		27.5	110	7		7		9			1	1985
22	HH 4059	317.0	52.2	2.6	8.3	1.7	0.9			16.5	100			7		9			1	1985
23	HH 4182										200	9		3		3			3	1985
24	RIO	543.0	108.6	5.4	29.3	1.4	0.7	3.3		20.0	160	9		9		5			1	1985
24	RIO	802.0	168.9	8.2	65.8	1.9	1.1	5.2	14.7	21.1	191	9		5	2	5	5	1	1	1986
24	RIO	508.0	101.1	7.4	37.7	2.5	1.6	3.4		19.9	193	9	5	4	2	5	4		1	1987
26	KELLER	533.0	110.6	3.3	17.8	1.2	0.9	1.2		20.8	140			9		3			1	1985
26	KELLER	782.0	167.4	4.8	37.5	2.2	1.3	1.3	15.9	21.4	208			6	1	6	3	2	1	1986
26	KELLER	972.0	168.6	3.9	37.8	1.4	1.0	1.5		17.4	144	7		5		7	1		1	1990
26	KELLER	387.9	99.8	2.7	10.4	1.0	0.8	1.0		25.7	170	0	5	6	1	5	3	1	1	1993
27	HB1E										120			5		3			3	1985
28	AT X 623 X RIO	726.0	147.4	6.2	44.9	1.3	0.9	4.0		20.3	170	9		7		3			1	1985
29	AT X 623 X CS 3541	575.0	127.4	5.8	33.6	1.5	1.1	3.2		22.2	110	7		3		3			1	1985
29	AT X 623 X CS 3541	475.0	100.5	6.1	28.8	2.3	2.0	1.8	14.1	21.2	155	3		3	5	4	3	1	1	1986
30	AT X 623 X BT X 430	503.0	102.6	3.7	18.4	1.8	1.2	0.7		20.4	90	9		3		7			1	1985
31	A ATLAS X RIO	947.0	170.9	5.0	47.4	1.5	0.9	2.6		18.1	170	9		5		5			1	1985
31	A ATLAS X RIO	720.0	175.3	8.0	57.4	1.9	1.2	4.9	13.3	24.3	198	5		5	5	3	5	5	1	1986
32	A ATLAS X BT X 430	948.0	182.0	4.8	45.0	1.7	1.1	1.9		19.2	160	9		3		7			1	1985
32	A ATLAS X BT X 430	551.0	121.8	7.3	40.3	2.5	1.6	3.2	13.2	22.1	159	7		3	2	5	3	3	1	1986
33	BRANDES										110			5		7			3	1985
33	BRANDES	569.0	150.7	7.4	42.3	2.7	1.7	3.1	17.7	26.5	133	5		6	1	7	3	1	1	1986
33	BRANDES	499.0	97.7	6.9	34.4	3.1	1.9	1.9		19.6	112	9	5	1	1	7	3		1	1987
34	ATLAS	745.0	131.5	4.1	30.8	1.8	1.2	1.2		17.7	120	9		7		5			1	1985
34	ATLAS	842.0	179.9	6.2	52.2	3.6	2.5	0.1	13.6	21.4	186	9		5	1	6	2	1	1	1986
35	BT X 623	316.0	71.7	3.9	12.3	1.1	1.3	2.0		22.7	80	9		7		5			1	1985
35	BT X 623	379.0	98.3	5.8	21.9	2.9	2.3	0.6	19.0	25.9	116	3		4	7	3	5	1	1	1986
36	ROMA	137.0	34.4	5.6	7.7	1.7	0.9	3.1		25.1	80	9		9		5			1	1985
36	ROMA	443.0	100.2	7.1	31.2	3.5	2.7	0.9	15.1	22.6	173	5		6	1	6	3	2	1	1986

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NO	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
37	RAMADA	247.0	60.3	8.0	19.7	1.9	1.4	4.7		24.4	100	9		9		1			1	1985
40	82055	318.0	74.4	4.1	13.0	1.6	0.9	1.5		23.4	100	9		5		7			1	1985
41	82141	446.0	76.3	3.0	13.6	1.4	1.2	0.5		17.1	110			7		3			1	1985
42	82142	413.0	72.7	3.6	15.0	1.7	1.1	0.8		17.6	90	9		7		7			1	1985
43	H533										160	5		9		9			5	1985
43	H533	531.0	133.4	6.2	32.8	2.7	2.3	1.2	16.7	25.1	215	1		7	1	9	4	1	1	1986
44	EXPRESS	669.0	152.9	4.8	32.3	1.2	1.1	2.5		22.9	80	5		3		5			1	1985
44	EXPRESS	362.0	124.6	5.2	18.9	2.6	2.3	0.3	23.7	34.4	102	3		4	4	4	4	1	1	1986
44	EXPRESS	371.6	90.6	3.4	12.6	0.9	0.8	1.7		24.4	103	3	4	3	1	4	1	3	1	1992
45	SIOUX	931.0	199.7	4.2	39.2	1.1	0.8	2.3		21.5	190	7		3		9			1	1985
45	SIOUX	662.0	161.5	8.1	53.6	2.6	2.0	3.5	14.3	24.4	218	3		4	1	6	3	4	1	1986
45	SIOUX	1244.0	271.4	7.4	92.1	2.6	2.1	2.7		21.8	202	7	8	1	2	8	3		1	1987
46	WRAY										140			3		3			5	1985
46	WRAY	970.0	180.0	5.5	53.4	2.4	1.5	1.6	11.3	18.6	150			5	1	5	3	1	1	1986
46	WRAY	1185.0	692.9	6.7	79.9	2.6	1.9	2.2		58.5	106	9	7	1	2	5	5		1	1987
46	WRAY	365.2	78.9	4.4	15.9	0.7	1.6	2.1		21.6	91	0	3	3	1	5	5	1	1	1993
47	RED TOP KANDY	898.0	198.0	7.1	63.9	1.8	1.2	4.2		22.1	190	7		5		3			9	1985
47	RED TOP KANDY	883.0	189.9	8.7	76.9	2.3	1.5	5.0	13.4	21.5	225	5		4	4	5	4	1	1	1986
47	RED TOP KANDY	963.0	186.1	9.1	87.9	3.7	2.6	2.8		19.3	178	7	7	2	1	4	2		1	1987
48	RTK-EXTRA	868.0	183.2	8.7	75.2	1.3	0.9	6.5		21.1	220	7		5		3			1	1985
46	RTK-EXTRA	692.0	176.0	8.5	59.1	2.6	1.9	4.1	16.4	25.4	206	5		6	4	4	3	2	1	1986
48	RTK-EXTRA	1136.0	245.2	8.1	91.9	2.8	2.0	3.4		21.6	215	7	7	1	2	5	3		1	1987
49	SUCROSORGE 405	1221.0	266.2	6.2	76.2	1.7	1.2	3.3		21.8	200	9		5		3			3	1985
49	SUCROSORGE 405	965.0	206.0	7.4	71.7	2.6	1.9	2.9	14.2	21.4	222	7		6	7	4	5	2	1	1986
49	SUCROSORGE 405	1177.0	226.0	6.1	71.2	1.9	1.6	2.5		19.2	198	9	8	1	5	4	5		1	1987
51	X8180 SW	926.0	196.8	8.1	74.5	1.5	1.2	5.3		21.3	190	7		3		3			7	1985
51	X8180 SW	890.0	212.6	8.8	78.5	2.0	1.5	5.3	15.0	23.9	226	3		4	5	5	3	2	1	1986
51	X8180 SW	962.0	219.9	8.4	81.1	1.8	1.5	5.2		22.9	213	7	8	3	1	4	4		1	1987
52	X8181 SW	1020.0	232.1	7.7	78.1	1.6	1.2	4.9		22.8	180	7		3		3			7	1985
52	X8181 SW	896.0	233.0	0.3	2.6	2.7	1.9	5.8	15.4	26.0	227	3		6	5	5	3	1	1	1986
52	X8181 SW	1119.0	245.7	8.1	91.0	1.8	1.4	5.0		22.0	214	7	7	3	3	5	3		1	1987
53	KRG	503.0	88.0	3.5	17.6	1.5	1.1	0.9		17.5	130	9		7		7			1	1985
53	KRG	1294.0	281.6	8.0	103.5	2.0	1.4	4.6	11.6	21.8	227	9		7	4	6	3	1	1	1986
53	KRG	607.0	359.1	6.2	37.7	2.1	1.6	2.5		59.2	102	9	3	4	1	5	3		1	1987
54	AGOLENE										160	9		3		3			5	1985
54	AGOLENE	1273.0	267.5	8.2	104.4	2.3	1.7	4.2	11.2	21.0	199	5		6	5	5	6	1	1	1986
54	AGOLENE	708.0	142.0	6.5	45.9	1.9	1.0	3.6		20.1	193	9	6	2	2	5	4		1	1987
55		731.0	168.4	8.0	58.8	2.7	1.9	3.4	20.4	23.0	224	3		5	1	6	2	4	1	1986
56	HB1E										140	9		3		3			5	1985
56	HB1E	657.0	116.4	4.7	30.8	2.6	1.5	0.6	10.1	17.7	212			7	3	4	3	2	1	1986
56	HB1E	892.0	149.6	5.6	50.2	2.5	1.2	2.0		16.8	159	9	6	1	2	5	3		1	1987
57	T-E-GOLDMAKER	1004.0	195.3	5.9	59.0	1.6	0.9	3.4		19.5	150	9		3		3			7	1985
57	T-E-GOLDMAKER	654.0	137.4	8.1	52.8	2.7	1.7	3.8	12.4	21.0	170	5		5	3	5	4	4	1	1986
57	T-E-GOLDMAKER	938.0	192.9	5.0	47.2	1.8	0.9	2.3		20.6	186	9	7	3	2	5	4		1	1987
58	ROX ORANGE INBRED	759.0	119.2	4.5	34.4	2.2	1.5	0.8		15.7	130	9		5		5			3	1985

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58	BOX ORANGE INBRED	534.0	106.1	8.4	44.6	3.9	2.6	1.9	12.3	19.9	190	5		3	1	6	3	1	1	1986
59	DALE										140			7		7			7	1985
59	DALE	756.0	188.5	11.1	84.1	3.1	2.7	5.3	13.5	24.9	172	3		6	1	4	3	1	1	1986
59	DALE	672.0	121.1	5.2	34.9	3.0	1.8	0.4		18.0	131	9	5	4	2	7	5		1	1987
59	DALE	1764.0	233.0	3.3	58.8	1.7	1.2	0.5		13.2	101			5		7	1		1	1990
59	DALE	162.8	41.9	1.1	1.8	0.6	0.6	0.0		25.8	123	0	3	3	1	7	3	1	1	1993
60	SWEET BEE	1009.0	189.7	7.1	72.0	1.8	1.2	4.1		18.8	170	9		3		3			3	1985
60	SWEET BEE	860.0	180.3	8.9	76.6	2.8	2.0	4.1	11.6	21.0	219	5		5	4	4	3	2	1	1986
60	SWEET BEE	940.0	187.3	6.2	58.2	2.4	1.4	2.4		19.9	203	9	7	1	1	5	2		1	1987
61	SUCROSURGE 301	854.0	196.0	7.7	65.7	1.1	0.8	5.8		23.0	180	7		9		3			5	1985
61	SUCROSURGE 301	656.0	166.8	10.6	69.6	2.7	2.2	5.8	14.1	25.4	206	3		4	2	7	3	2	1	1986
61	SUCROSURGE 301	1041.0	245.0	7.6	79.4	1.9	1.3	4.4		23.5	212	7	7	1	2	3	3		1	1987
62	KUNSAGI 460	798.0	176.8	7.4	58.8	1.8	1.3	4.3		22.2	140	7		5		5			5	1985
62	KUNSAGI 460	689.0	161.9	7.7	52.8	2.8	2.2	2.7	15.5	23.5	231	3		4	6	5	4	2	1	1986
62	KUNSAGI 460	655.0	150.0	7.3	47.8	2.1	1.4	3.8		22.9	168	7	6	4	2	5	3		1	1987
63	TAPIO	815.0	220.1	6.5	52.7	1.9	1.2	3.4		27.0	180	7		1		5			3	1985
63	TAPIO	878.0	233.4	7.5	66.2	2.8	2.2	2.5	17.9	26.6	180	3		4	5	7	4	1	1	1986
63	TAPIO	897.0	207.9	6.2	55.9	1.9	1.2	3.1		23.2	197	7	9	2	3	6	5		1	1987
70	TEXAS										110			9		3			1	1985
70	TEXAS	597.0	133.6	8.5	50.6	3.0	2.6	2.9	13.5	22.4	183	5		7	4	5	3	4	1	1986
70	TEXAS	478.0	92.2	6.2	29.4	1.7	1.4	3.1		19.3	136	9	4	4	1	6	4		1	1987
71	FUNDULEA 107-1/83	762.0	173.7	8.2	62.7	1.7	1.1	5.4		22.8	190	9		7		3			5	1985
71	FUNDULEA 107-1/83	647.0	152.1	10.1	65.5	3.3	2.4	4.4	15.2	23.5	247	3		5	7	3	5	1	1	1986
72	FUNDULEA 7323/83	675.0	221.7	4.6	31.0	1.3	1.0	2.2		32.9	170	7		1		5			3	1985
72	FUNDULEA 7323/83	435.0	141.1	6.2	27.1	2.8	2.2	1.3	23.9	32.4	218	3		4	7	7	5	1	1	1986
73	FUNDULEA 215/83	485.0	96.0	6.7	32.3	2.6	1.6	2.5		19.8	160	9		9		3			1	1985
73	FUNDULEA 215/83	849.0	199.9	8.8	74.5	3.8	2.8	2.2	14.1	23.6	203	5		5	3	6	4	1	1	1986
74	143 JANTAR CHERNYI	242.0	51.9	5.9	14.2	2.6	1.6	1.6		21.5	150	7		9		7			1	1985
75	290 SUMAK RANNIJ										110			9		7			3	1985
76	337 JANTAR CHERNYJ	775.0	167.0	7.7	59.4	2.0	1.4	4.3		21.6	160	7		3		5			3	1985
77	342 SUMAK	502.0	101.9	5.6	28.1	3.3	1.9	0.4		20.3	120			7		9			1	1985
77	342 SUMAK	612.0	140.9	8.4	51.5	3.3	3.1	2.0	12.6	23.0	191	3		3	2	6	4	4	1	1986
78	RED AMBER VIR 362	756.0	134.6	4.8	36.5	2.4	1.3	1.1		17.8	160	9		9		7			1	1985
78	RED AMBER VIR 362	699.0	153.9	8.5	59.2	4.0	2.8	1.7	14.3	22.0	185	5		6	5	6	5	1	1	1986
79	LEOTI RED SORGO VIR 668	340.0	62.2	5.8	19.7	2.6	1.7	1.5		18.3	130	9		7		3			1	1985
79	LEOTI RED SORGO VIR 668	403.0	101.3	5.7	22.9	2.6	2.7	0.8	17.6	25.1	207	5		5	2	3	2	2	1	1986
80	731 ORANZEVOE	301.0	53.1	4.2	12.5	1.7	1.0	1.5		17.7	110	9		9		5			1	1985
81	1062 JANTAR RANNIJ VIR 1062	170.0	37.0	4.3	7.2	1.8	0.7	1.7		21.8	100	9		9		7			3	1985
82	MEDOVOJE VIR 1064	107.0	19.5	5.1	5.5	2.4	1.1	1.6		18.3	140	9		9		7			3	1985
83	1375 ORANZEVOE										100	9		9		7			1	1985
89	1683	316.0	65.4	5.5	17.4	1.0	0.6	3.9		20.7	110			7		7			1	1985
90	OP. ST.	779.0	165.9	5.8	45.0	1.5	1.1	3.2		21.3	140	7		5		5			7	1985

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91	KES 227 X 27	804.0	154.0	5.6	45.0	1.5	1.1	3.1		19.2	160	7		7		3			3	1985
91	KES 227 X 27	732.0	168.7	7.3	53.2	3.4	2.9	1.1	14.5	23.1	175	3		5	5	5	3	3	1	1986
92	P.721 X 266-A										140	9		5		1			1	1985
92	P.721 X 266-A	679.0	165.5	7.8	53.0	2.6	2.2	3.1	14.9	24.4	176	5		5	5	3	3	1	1	1986
93	(648 X 3869) X 635-A	755.0	174.8	6.1	46.4	2.0	1.3	2.9		23.2	160	9		3		5			3	1985
93	(648 X 3869) X 635-A	758.0	131.1	7.6	57.3	3.4	2.7	1.5	15.2	17.3	203	5		6	2	6	2	1	1	1986
94	(635 X 3135) X 858	756.0	159.1	4.8	36.1	1.4	1.0	2.3		21.1	130	9		3		5			3	1985
94	(635 X 3135) X 858	689.0	142.1	6.8	47.1	3.1	2.4	1.3	13.5	20.6	187	5		3	7	3	3	5	1	1986
95	(688 X 3135) X 858	802.0	162.0	5.6	44.8	1.5	1.0	3.0		20.2	170	7		5		3			5	1985
95	(688 X 3135) X 858	614.0	128.6	8.0	48.9	3.3	2.5	2.2	16.6	21.0	181	3		7	5	3	5	5	1	1986
96	8525	491.0	103.4	4.8	23.7	1.5	1.1	2.3		21.1	130			5		3			1	1985
98	635 X 1836	517.0	113.7	7.8	40.1	1.0	0.6	6.1		22.0	140	7		7		3			5	1985
98	635 X 1836	530.0	143.6	9.0	47.5	3.1	2.6	3.3	17.9	27.1	177	3		5	3	7	5	5	1	1986
99	LEOTI	422.0	96.2	6.2	26.3	2.0	0.9	3.3		22.8	140	7		7		5			3	1985
99	LEOTI	632.0	161.1	9.0	56.6	3.9	3.2	1.8	16.9	25.5	192	3		4	2	4	2	1	1	1986
100	IS 12329-A										100	9		9		5			3	1985
100	IS 12329-A	584.0	129.2	8.5	49.5	2.7	1.9	4.3	13.5	22.1	166	5		8	3	4	5	6	1	1986
101	(266 X 3871) X 1023										150	9		3		5			5	1985
101	(266 X 3871) X 1023	549.0	127.3	6.9	37.8	1.9	1.3	3.7	14.8	23.2	164	3		7	2	6	3	2	1	1986
102	IS 12329										110	9		9		5			5	1985
102	IS 12329	930.0	180.2							19.4	217	9	9	1	5	5	5		1	1987
103	658 X OP. ST.	501.0	107.5	4.8	24.0	0.9	0.5	3.3		21.5	160	7		7		5			1	1985
103	658 X OP. ST.	536.0	129.4	8.3	44.7	1.8	1.3	5.3	15.4	24.1	198	3		5	5	3	3	5	1	1986
104	TUB7 X 846										90			3		1			1	1985
104	TUB7 X 846	411.0	114.9	7.2	29.5	1.9	1.4	3.9	16.5	28.0	189	3		5	5	3	3	3	1	1986
105	1742 X 1416										130			3		3			3	1985
105	1742 X 1416	346.0	79.3	5.2	17.9	1.9	1.5	1.7	15.0	22.9	164	5		5	3	5	3	3	1	1986
105	1742 X 1416	953.0	202.2							21.2	204	7	8	2	2	5	3		1	1987
106	(688 X TUB7) X 1023	483.0	105.3	4.3	20.9	1.2	0.9	2.2		21.8	140	9		9		7			3	1985
107	(648 X 3869) X 635	661.0	154.3	7.1	46.8	2.0	1.3	3.8		23.4	140	7		5		9			3	1985
107	(648 X 3869) X 635	438.0	111.7	7.7	33.6	2.6	1.9	3.2	15.9	25.5	182	3		7	1	6	3	4	1	1986
108	HK SORDON 70	671.0	147.0	4.6	30.7	1.2	0.9	2.5		21.9	150	9		5		5			1	1985
108	HK SORDON 70	633.0	165.7	6.6	41.9	2.2	1.5	2.9	17.2	26.2	183	3		5	1	7	3	3	1	1986
108	HK SORDON 70	1028.0	226.9							22.1	213	7	7	4	1	4	2		1	1987
109	1742 X 1414										80			9		5			1	1985
110	1642	696.0	170.2	5.3	36.5	0.9	0.6	3.8		24.5	140	9		9		3			1	1985
111	642	517.0	118.9	5.2	27.0	1.0	0.9	3.3		23.0	130	9		9		3			3	1985
111	642	464.0	120.1	6.1	28.1	1.8	1.4	2.9	16.6	25.9	173	3		7	3	7	3	1	1	1986
112	50 X 846	751.0	197.5	6.0	44.8	1.3	1.0	3.7		26.3	230	7		7		5			1	1985
113	(635 X 3135) X 858										180	7		5		5			3	1985
114	AKSU-78	619.0	164.7	5.2	32.4	1.0	0.9	3.3		26.6	200	7		5		9			3	1985
114	AKSU-78	533.0	152.0	6.8	36.1	1.4	1.0	4.4	20.7	28.5	239	3		7	1	7	3	1	1	1986
115	GUEZOE-80	663.0	190.6	6.2	41.2	1.3	1.1	3.9		28.8	200	5		5		9			3	1985

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116	SOR 24/82	424.0	143.3	4.6	19.5	0.9	0.5	3.2		33.8	160	9		5		5			1	1985
117	SOR 9/78	472.0	115.6	3.3	15.6	1.5	0.9	0.9		24.5	110	5		9		5			1	1985
118	SOR 4/83	406.0	116.9	5.6	22.7	1.8	1.5	2.3		28.8	160	9		5		3			9	1985
119	SOR 12/83	344.0	131.8	8.0	27.4	1.4	1.1	5.5		38.3	120	5		7		5			7	1985
120	SOR 11/82	252.0	74.8	7.8	19.8	1.9	1.4	4.6		29.7	150	9		7		3			5	1985
121	SOR 23/81	448.0	141.6	5.5	24.7	1.4	1.0	3.1		31.6	170	5		5		3			3	1985
122	HAAKDORING										120			7		5			3	1985
123	S-59-8-6 70418	1042.0	160.0	2.8	29.5	1.4	0.9	0.5		15.4	140			7		5			3	1985
124	CAPRICORN 1-59-A-7 70545	659.0	118.0	3.4	22.3	1.3	0.9	1.2		17.9	120			9		3			1	1985
125	70573	678.0	109.2	1.7	11.7	0.9	0.7	0.2		16.1	100			7		5			1	1985
126	73-7	495.0	90.6	3.0	15.0	1.5	0.9	0.7		18.3	100			9		9			3	1985
127	P 183 71178	788.0	165.5	2.8	21.8	1.1	0.9	0.8		21.0	150			5		3			5	1985
128	GAMBELA 1107 71442	278.0	65.9	3.2	8.9	1.5	1.0	0.7		23.7	110			7		3			1	1985
129	ZENGADA 71500	652.0	105.3	3.0	19.2	1.6	1.3			16.2	120			5		3			1	1985
130	KURUNE 71555	848.0	154.8	3.3	28.3	1.6	1.0	0.8		18.3	190	9		5		5			5	1985
131	71822	634.0	142.0	4.6	29.0	2.3	1.3	1.0		22.4	140			5		5			1	1985
132	71897	340.0	80.2	5.2	17.7	2.4	2.4	0.5		23.6	120	9		3		5			1	1985
133	KEI ZENGADA 72470	773.0	156.2	3.6	28.1	1.9	1.5	0.3		20.2	150			5		5			5	1985
134	ABDULATA 72606	629.0	95.0	1.8	11.3	0.9	0.9			15.1	140			7		3			3	1985
135	TINKISH 72861	870.0	149.6	3.6	31.3	2.0	1.5	0.1		17.2	160			5		3			1	1985
136	72952	658.0	128.0	3.6	23.6	1.9	1.2	0.5		19.5	130			5		5			1	1985
137	72984	759.0	130.6	0.9	6.5	0.5	0.4	0.1		17.2	160			3		5			3	1985
138	AFERIE 73151	726.0	115.4	4.0	29.3	1.4	0.8	1.9		15.9	160			7		3			3	1985
139	METCH KETTETO 73309	804.0	143.1	3.4	27.7	1.3	0.8	1.4		17.8	150			7		5			1	1985
140	73430	850.0	140.7	3.8	32.1	1.5	0.8	1.5		16.6	130			7		5			1	1985
141	73431	773.0	150.0	4.0	30.7	1.4	0.8	1.7		19.4	150			5		5			1	1985
142	TINKISH 73437	559.0	98.1	3.9	21.5	1.5	0.9	1.5		17.6	160			5		5			3	1985
143	73479	667.0	127.4	4.8	32.3	1.6	1.0	2.3		19.1	140			5		5			1	1985
144	73504	587.0	107.4	2.9	17.3	1.6	1.0	0.4		18.3	130			7		5			1	1985
145	HER 74-8	433.0	92.7	4.1	17.6	1.6	1.0	1.5		21.4	120			7		5			1	1985
146	HAVAI TINKISH 73701	649.0	116.2	4.1	26.5	1.9	1.1	1.1		17.9	140			7		5			1	1985
147	TINKISH 73738	754.0	133.8	5.1	38.6	2.3	1.4	1.4		17.8	140			7		3			5	1985
148	CHIBAL 73910	620.0	135.8	4.6	26.8	1.6	1.1	2.0		21.9	140			5		5			1	1985
149	TINKISH 74109	682.0	131.6	4.8	33.0	2.2	1.3	1.3		19.3	150			7		3			3	1985
150	TINKISH HAVAI 74167	821.0	156.8	4.3	34.9	1.9	1.1	1.3		19.1	140			5		3			3	1985
151	TINKISH GEGEBSA 74195	587.0	91.6	3.4	19.8	1.8	1.2	0.4		15.6	160			9		1			1	1985
152	TINKISH 74208	715.0	123.0	3.7	26.3	2.0	1.3	0.4		17.2	150			7		3			1	1985
153	DEGALIT 74209	715.0	125.8	4.0	28.2	2.0	1.5	0.5		17.6	160			5		3			3	1985
154	74648	817.0	147.9	4.7	38.3	2.1	1.3	1.2		18.1	150			5		5			3	1985
155	KASHMITA 74656	413.0	67.9	0.5	1.9	0.2	0.2			16.5	100			9		7			1	1985
156	RARA 74699	470.0	101.1	1.8	8.3	1.1	0.7			21.5	80			9		5			1	1985
157	28-24 74813	453.0	88.8	2.9	13.1	1.6	1.1	0.1		19.6	80			5		5			1	1985
158	74832	649.0	107.1	3.5	22.8	1.2	1.1	1.1		16.5	130			5		3			3	1985

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159	74866	506.0	84.0	2.6	13.4	1.1	1.0	0.6		16.6	100			7		3			5	1985
160	74876	380.0	80.2	2.9	11.0	1.4	1.2	0.4		21.1	100			9		5			3	1985
161	74884	521.0	91.2	2.8	14.5	1.1	1.0	0.7		17.5	110			7		3			3	1985
162	JELDE 74907	662.0	114.5	2.7	18.1	1.1	1.0	0.7		17.3	120			7		5			1	1985
163	MISC-11 74929	499.0	89.8	3.0	14.9	1.1	1.0	0.9		18.0	110			5		5			3	1985
164	BARBARI 75236	311.0	65.3	4.2	12.9	1.3	1.1	1.8		21.0	110			5		5			1	1985
165	WS-1763 200144	695.0	116.1	2.4	16.3	0.9	0.8	0.6		16.7	80			5		1			1	1985
166	MASHILA GERS 200292	680.0	109.5	2.6	17.6	1.0	0.9	0.7		16.1	90			7		5			1	1985
167	CANE AMBER	223.0	60.7	6.4	14.2	2.1	1.3	3.0		27.2	140	5		9		7			3	1985
167	CANE AMBER	489.0	142.6	8.8	42.8	3.0	2.3	3.4	17.4	29.2	210	1		6	4	6	3	1	2	1986
167	CANE AMBER	359.0	87.0	6.7	23.9	3.1	1.5	2.0		24.2	164	5	4	1	4	5	5		1	1987
168	TAPID X HONEY	869.0	169.9	5.1	43.9	1.7	1.3	2.0		19.6	140	7		3		5			3	1985
168	TAPID X HONEY	609.0	139.6	8.6	52.5	3.3	2.3	3.0	13.7	22.9	215	7		5	1	4	3	1	1	1986
168	TAPID X HONEY	985.0	182.7	5.7	56.0	3.3	2.0	0.4		18.6	190	7	7	1	1	5	5		1	1987
170	WACONIA ORANGE CANE	562.0	120.8	9.2	51.8	2.6	1.6	5.1		21.5	160	9		5		5			1	1985
170	WACONIA ORANGE CANE	813.0	194.8	10.3	83.8	3.4	2.3	4.6	12.9	24.0	191	5		4	2	7	3	2	1	1986
170	WACONIA ORANGE CANE	589.0	130.1	9.2	54.1	4.8	3.3	1.1		22.1	156	9	5	2	2	6	3		1	1987
171	MINNESOTA AMBER	230.0	50.1	8.2	18.9	2.3	1.4	4.5		21.8	130	7		7		3			1	1985
171	MINNESOTA AMBER	875.0	189.9	9.0	79.0	3.5	2.5	3.0	16.3	21.7	219	3		6	4	5	3	2	1	1986
171	MINNESOTA AMBER	717.0	136.8	7.0	50.0	4.2	2.3	0.5		19.4	188	7	6	1	3	5	3		1	1987
172	HUAN-LO-SON NR. 1	138.0	43.8	4.7	6.5	2.0	1.5	1.4		31.7	150	7		9		1			7	1985
172	HUAN-LO-SON NR. 1	352.0	122.0	6.3	22.3	2.2	2.0	2.1	25.9	34.7	256	3		6	2	3	3	4	1	1986
172	HUAN-LO-SON NR. 1	[illegible]	90.5	5.3	12.3	1.0	1.0	3.2		38.9	183	1	4	3	5	3	5	3	2	1992
173	DINDERRAVEN										120	5		7		3			1	1985
173	DINDERRAVEN	810.0									141	3		5	3	5	5	1	1	1986
173	DINDERRAVEN	461.0	122.7	7.3	35.0	3.3	2.3	1.6		25.5	131	7	5	2	2	5	5		1	1987
174	EARLY AMBER	158.0	40.3	6.4	10.1	2.5	1.7	2.3		25.5	100	7		9		7			3	1985
174	EARLY AMBER	551.0	156.4	9.8	53.9	3.2	2.5	4.2	17.5	28.4	209	3		6	3	6	4	1	1	1986
174	EARLY AMBER	612.0	145.2	7.5	46.0	4.0	2.7	0.8		23.7	170	5	5	2	1	5	3		1	1987
176	SORGO VIR 1062	368.0	96.1	6.6	24.2	2.5	1.3	2.7		26.1	150	9		9		3			1	1985
177	RED TOP VIR 343	653.0	138.8	7.1	46.2	2.7	1.5	2.8		21.3	110	9		5		3			1	1985
179	ERALI ORANGE SORGHUM VIR 1375	461.0	92.2	4.7	21.7	2.6	1.4	0.7		20.0	120	9		9		5			3	1985
180	SUMAK SORGO VIR 290	360.0	71.6	5.1	18.3	1.9	1.7	1.5		19.9	110	9		7		5			1	1985
181	SORGO SUCRE VIR 337	763.0	174.7	7.6	57.8	1.5	1.1	5.1		22.9	150	7		1		3			7	1985
182	SORGO SAHARNOJI VIR 143	412.0	95.0	6.9	28.5	2.3	1.5	3.2		23.1	170	7		7		3			5	1985
183	SORGO MEDOVOJE VIR 1064	628.0	122.5	7.1	44.3	2.5	1.2	3.4		19.5	180	7		5		3			7	1985
183	SORGO MEDOVOJE VIR 1064	992.0	202.3	8.6	85.0	2.8	1.7	4.1	11.7	20.4	238	5		7	1	5	4	1	1	1986
184	SORGO CANDAAZUCAR VIR 731	608.0	115.2	5.2	31.4	2.0	1.3	1.9		19.0	160	9		5		5			3	1985
184	SORGO CANDAAZUCAR VIR 731	828.0	195.6	7.0	58.0	2.8	1.8	2.4	14.2	23.6	196	5		5	3	5	5	1	1	1986

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185	MER 75-10	565.0	120.9	6.7	37.8	1.7	0.8	4.1		21.4	110	9		7		5			1	1985
186	MER 78-13	495.0	88.6							17.9	110			9		3			1	1985
186	MER 78-13	1360.0	308.0	9.0	22.0	1.5	1.3	6.6		22.7	134			5		5	1		3	1990
187	SX8275 L256	1014.0	189.1	4.8	49.1	1.4	1.0	2.4		18.7	140	9		3		3			3	1985
187	SX8275 L256	961.0	211.3	7.7	74.3	2.8	2.1	2.8	13.9	22.0	230	7		5	7	5	4	2	1	1986
187	SX8275 L256	1375.0	237.7	4.5	62.0	2.4	1.7	0.5		17.3	233	9	9	1	3	5	5		1	1987
188	HKB.-8180-7437	1017.0	233.4	7.4	75.3	1.0	0.8	5.6		23.0	200	7		3		3			7	1985
188	HKB.-8180-7437	922.0	239.7						16.6	26.0	239	3		6	4	5	3	4	1	1986
188	HKB.-8180-7437	907.0	201.5	7.9	71.4	2.8	2.0	3.0		22.2	215	7	9	3	2	5	3		1	1987
189	HKB.-8361-8192	1393.0	241.7	3.9	53.9	1.3	0.9	1.7		17.4	190			3		3			1	1985
189	HKB.-8361-8192	1106.0	218.0	5.2	58.0	2.0	1.3	1.9	13.4	19.7	205			6	7	3	5	1	1	1986
189	HKB.-8361-8192	1259.0	280.9	3.8	47.7	2.0	1.4	0.4		22.3	187	9	8	2	3	4	5		1	1987
190	HKB.-8478-8469	928.0	202.7	5.1	46.9	1.6	1.3	2.2		22.0	160	9		3		5			1	1985
190	HKB.-8478-8469	1036.0	211.5	6.8	70.1	1.7	1.1	4.0	12.3	20.4	197	7		5	7	3	3	1	1	1986
190	HKB.-8478-8469	994.0	146.8	6.0	59.1	2.7	1.9	1.4		14.9	169	9	6	3	3	5	2		1	1987
191	HKB.-8180-8475	818.0	204.1	8.0	65.5	1.2	0.8	6.0		25.0	180	9		5		5			5	1985
191	HKB.-8180-8475	547.0	147.6	9.8	53.6	1.9	1.3	6.6	16.8	27.0	228	3		5	4	3	4	2	1	1986
191	HKB.-8180-8475	913.0	202.1	7.3	66.8	2.7	1.9	2.7		22.1	208	7	7	4	2	4	3		1	1987
192	THEIS	712.0	145.1	5.5	39.1	2.2	1.3	2.0		20.4	160			5		3			3	1985
192	THEIS	882.0	191.6	7.8	68.6	3.3	2.1	2.4	12.2	21.7	219			6	3	5	3	1	1	1986
192	THEIS	693.0	125.8	5.5	37.9	3.2	2.1	0.2		19.6	178	9	6	1	1	6	3		1	1987
193	HKB.-8276-7928	516.0	149.7	6.9	42.8	1.3	0.9	4.8		24.3	160	9		7		5			1	1985
193	HKB.-8276-7928	773.0	196.6	7.7	59.8	2.8	2.2	2.8	16.5	25.4	217	5		3	7	7	5	1	1	1986
194	HKB.-8278-7893	634.0	171.5	8.1	51.5	1.0	0.8	6.3		27.1	150	5		7		5			1	1985
194	HKB.-8278-7893	440.0	129.9	9.2	40.6	1.7	1.3	6.2	18.4	29.5	191	1		5	3	3	3	1	1	1986
195	HKB.-8280-7894	752.0	195.5	8.2	62.4	1.2	0.8	6.2		25.7	150	7		7		5			1	1985
195	HKB.-8280-7894	660.0	177.4	8.1	53.6	2.6	2.1	3.4	16.0	26.9	212	3		5	3	5	3	1	1	1986
196	HKB.-8363-8191	700.0	176.1	7.0	49.2	1.0	0.7	5.3		25.2	150	7		7		5			3	1985
196	HKB.-8363-8191	937.0	221.4	7.9	74.0	1.5	1.1	5.3	13.8	23.6	207	5		5	7	5	3	1	1	1986
197	HKB.-8364-8187	762.0	165.0	5.6	42.4	1.2	0.8	3.6		21.7	150	7		5		3			1	1985
197	HKB.-8364-8187	1261.0	269.0	8.6	108.5	1.6	1.2	5.8	11.3	21.3	228	3		6	5	6	4	1	1	1986
198	HKB.-8368-8189	877.0	183.3	5.7	50.3	1.1	0.7	4.0		20.9	130			7		3			3	1985
198	HKB.-8368-8189										197	7		5	3	4	3	1	1	1986
199	SZARVASI BARNA	270.0	50.8	3.5	9.4	1.1	0.9	1.5		18.8	130			9		5			1	1985
199	SZARVASI BARNA	760.0	172.7	6.2	46.9	2.6	2.1	1.4	14.2	22.7	215	5		7	6	4	5	1	1	1986
200	WHITE COLLIER	472.0	112.3	5.3	25.0	1.5	1.6	2.9		23.8	100			9		5			1	1985
200	WHITE COLLIER	635.0	159.8	8.6	54.4	2.8	2.0	3.7	17.2	25.2	148	5		7	5	6	5	1	1	1986
200	WHITE COLLIER	612.0	137.9	7.5	45.7	2.2	1.4	4.0		22.5	142	7	5	1	4	5	4		1	1987
201	PICKETT #2	124.0	36.5	6.5	8.1	2.2	2.0	2.3		29.5	80	9		9		3			1	1985
201	PICKETT #2	362.0	93.7	5.7	20.6	2.8	2.1	0.8	18.3	25.9	98	3		4	4	1	4	4	1	1986
201	PICKETT #3	1084.0	220.6							20.4	206	7	7	2	2	5	3		1	1987
202	B-ROX	238.0	44.7	2.8	9.0	2.0	1.6			18.8	80			9		5			1	1985
202	B-ROX	515.0	141.3	6.6	34.0	3.2	2.2	1.2	21.6	27.4	178	5		7	2	6	3	1	1	1986
203	B-ORANGE	325.0	62.7							19.3	110			9		5			1	1985
203	B-ORANGE										179	5		5	2	5	3	1	1	1986

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NO	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
204	KESDI BARNA	252.0	53.3	5.4	13.5	2.3	2.3	0.8		21.2	120	9		9		5			1	1985
204	KESDI BARNA	779.0	201.6	9.6	75.1	2.8	2.2	4.7	15.0	25.9	217	5		6	3	5	3	1	1	1986
204	KESDI BARNA	685.0	150.0	7.7	52.5	2.3	2.0	3.4		21.9	186	7	6	3	1	3	4		1	1987
205	X4001	831.0	169.1	5.0	41.9	2.1	1.7	1.2		20.4	130	9		7		5			3	1985
205	X4001	982.0	226.8	8.0	78.2	2.8	2.1	3.1	15.0	23.1	220	5		7	1	5	1	3	1	1986
206	X4021	1095.0	239.3	3.3	36.2	0.9	0.9	0.1		21.9	140	9		5		5			3	1985
206	X4021										203	7		5	5	5	3	1	1	1986
207	X4024	671.0	140.2	5.0	33.6	1.9	1.9	1.8		20.9	140	9		5		3			1	1985
208	X4025	706.0	165.9	8.3	58.7	1.5	1.5	5.0		21.5	150	9		5		3			1	1985
209	X4041	671.0	164.1	6.8	45.7	1.8	1.8	3.6		24.5	160	9		7		5			1	1985
210	X4046	784.0	204.2	6.4	50.2	1.9	1.9	2.0		26.1	170	7		5		3			3	1985
211	AK 50	584.0	109.2	5.0	29.1	2.7	2.7	0.5		18.7	110	9		7		5			3	1985
212	A 48	473.0	101.2	3.7	17.6	2.2	2.2	0.2		21.4	80	9		7		5			1	1985
213	A 3077	115.0	25.8	1.9	2.2	1.0	1.0			22.4	60			9		9			3	1985
214	ATX 623	258.0	64.8	6.0	15.4	2.0	2.0	2.3		25.1	90	9		9		3			1	1985
215	AKS	509.0	124.5	7.4	37.6	2.3	2.3	2.9		24.5	130	9		7						1985
216	REX MINISTERIO													9						1985
217	KANSAS ORANGE	314.0	70.3	7.9	24.8	3.1	3.1	3.0		22.4	120			7		5			1	1985
218	GUATRACHE	265.0	57.8	6.1	16.1	2.7	2.7	1.2		21.8	100			5		3			1	1985
219	HONEY	164.0	31.0	4.0	6.6	2.3	2.3			18.9	80			9		3			3	1985
220	EARLY SUMAC	102.0	19.9	2.0	2.1	0.5	0.5			19.5	110			9		3			1	1985
221	KANSAS ORANGE	84.0	13.9	2.9	2.4	1.3	1.3			16.5	110			9		5			1	1985
222	CHIKEN CORN	110.0	18.0	2.9	3.2	1.6	1.6			16.4	110			9		5			1	1985
223	ATLAS X SUNRISE	203.0	45.5	2.4	4.9	1.4	1.4			22.4	110			9		7			1	1985
224	FUNDULEA 215/62	280.0	75.2	6.1	17.0	3.0	3.0	0.3		26.9	110	9		9		5			1	1985
224	FUNDULEA 215/62	553.0	136.7	6.2	34.2	2.9	2.1	1.1	17.6	25.1	153	7		5	2	6	4	4	1	1986
225	K-9234													9						1985
226	K-9235	395.0	128.0	3.0	11.9	1.2	1.2			32.4	160	7		5		3			7	1985
227	K-9236	521.0	135.5	0.6	2.9	0.5		0.5		26.0	130	7		7		7			3	1985
228	I-472787 ADO'CS	942.0	273.2	2.8	26.5	1.0	1.0			29.0	130	7		7		3			1	1985
229	I-472789 BALATONCSICSO'	519.0	129.2	2.7	13.8	1.5	1.5			24.9	120	7		3		5			1	1985
230	I-472795 NYIREGYHA'ZA	645.0	162.5	2.8	18.1	1.3	1.2			25.2	200	9		5		3			7	1985
231	MER 80-10	451.0	106.4	5.8	26.3	2.3	2.3	1.5		23.6	130	9		9		3			1	1985
232	MER 81-2	437.0	119.5	7.2	31.5	2.3	2.3	3.1		27.4	120	7		9		5			1	1985
233	MN 1500	470.0	99.4	5.1	23.7	2.3	2.3	1.0		21.2	130			9		5			1	1985
233	MN 1500	1183.0	184.1	3.9	45.9	1.6	1.1	1.2		15.6	135	5		3		5	3		3	1990
234	COWLEY	433.0	103.5	7.5	32.3	2.6	2.6	3.2		23.9	110	9		9		5			1	1985
235	HEGARI	294.0	75.9	8.2	24.2	1.8	1.8	5.2		25.8	90	7		9		5			1	1985
235	HEGARI	367.0	96.7	8.1	29.8	3.2	2.2	2.7	17.1	26.4	130	3		5	4	6	4	1	1	1986
237	A ATLAS X P.3	721.0	181.3	6.8	49.1	2.2	2.2	2.4		25.2	160	9		5		3			1	1985
237	A ATLAS X P.3	904.0	217.5	7.0	63.6	2.9	2.1	2.0	16.5	24.1	217	3		3	5	5	3	1	1	1986
238	A ATLAS X BMR-12	743.0	174.6	6.2	45.8	2.7	2.7	1.2		23.5	160	9		5		3			1	1985
238	A ATLAS X BMR-12	602.0	143.6	8.3	49.9	3.1	2.0	3.2	16.0	23.9	219	5		5	5	5	3	3	1	1986

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239	A ATLAS X RT X 432	808.0	186.7	5.8	46.5	2.1	2.1	1.8		23.1	130	7		5		5			1	1985
239	A ATLAS X RT X 432	792.0	195.1	8.5	67.6	2.8	2.1	3.7	15.9	24.6	200	5		3	5	4	3	3	1	1986
240	AT X 623 X P-3	561.0	147.8	5.3	29.5	1.5	1.5	0.9		26.4	120	9		5		3			1	1985
240	AT X 623 X P-3	348.0	97.4	8.1	28.2	3.1	2.5	2.5	18.5	28.0	157	3		5	5	3	5	1	1	1986
241	AT X 623 X RT X 432	294.0	79.8	5.9	17.3	2.4	2.4	1.3		27.2	80	7		9		3			1	1985
241	AT X 623 X RT X 432	510.0	112.3	4.9	24.8	2.3	2.0	0.6	14.7	22.0	120	3		3	7	3	5	1	1	1986
242	AT X 623 X BKR-12	559.0	147.3	7.6	42.7	2.5	2.5	2.8		26.4	130	7		7		5			1	1985
242	AT X 623 X BKR-12	617.0	146.7	7.9	48.7	3.6	1.2	0.7	15.8	23.8	205	3		3	7	5	5	1	1	1986
243	AT X 623 X KELLER	529.0	117.7	5.4	28.7	1.6	1.6	2.0		22.3	170			7		5			1	1985
243	AT X 623 X KELLER	197.0	51.3	6.9	13.6	3.0	2.2	1.8	17.5	26.1	236	5		7	5	5	3	1	1	1986
244	AT X 623 X GREENLEAF	743.0	201.4	5.5	40.8	1.5	1.5	2.0		27.1	190	7		5		7			1	1985
244	AT X 623 X GREENLEAF	594.0	160.8	9.4	55.8	2.9	2.2	4.3	16.7	27.1	238	1		7	1	7	3	1	1	1986
245	AT X 623 X HEGARI	523.0	127.9	5.8	30.2	1.7	1.7	1.8		24.5	160	7		7		3			1	1985
245	AT X 623 X HEGARI	898.0	193.9	6.5	57.9	2.9	2.4	1.1	13.5	21.6	206	3		3	7	5	5	1	1	1986
246	AT X 623 X 77CS3	629.0	152.0	4.8	30.1	2.3	2.3	0.5		24.2	100			5		3			1	1985
247	FUNTES 1990	962.0	202.5	4.2	40.1	2.3	2.3			21.1	120			3		3			1	1985
248	SG. 4543	450.0	81.5	3.8	17.2	2.2	2.2			18.1	90			3		7			1	1985
249	SG. 4545	309.0	65.5	2.1	6.5	1.0	1.0			21.2	70			3		7			1	1985
250	SG. 4579	291.0	54.7	3.4	10.0	1.9	1.9			16.8	70			5		7			1	1985
251	SG. 4762	300.0	56.1	2.0	5.9	1.1	1.1			18.7	70			5		7			1	1985
252	SG. 4938	336.0	57.5	2.4	8.1	1.4	1.4			17.1	80			5		7			1	1985
253	SG. 2095	190.0	37.1	1.3	2.5	0.6	0.6	0.1		19.5	60			7		7			1	1985
254	SG. 2309	238.0	52.1	6.4	15.2	3.0	3.0	1.2		21.9	100			9		7			1	1985
255	SG. 2327										50			9		9			1	1985
256	SG. 2505	247.0	48.2	3.7	9.2	1.9	1.9	0.4		19.5	140	9		9		7			5	1985
257	SG. 2511	353.0	81.2	6.6	23.2	2.9	2.9	1.4		23.0	110	9		9		5			3	1985
258	SG. 2528	150.0	32.7	3.7	5.6	2.2	2.2			21.8	60			7		3			1	1985
259	SG. 2546	393.0	75.5	4.7	18.6	2.4	2.4	0.7		19.2	110			7		7			3	1985
260	SG. 2562	88.0	19.3	2.2	2.0	1.3	1.3			21.9	50			9		5			3	1985
261	SG. 2565	212.0	49.6	5.2	11.0	2.6	2.6	0.7		22.4	100			7		5			1	1985
262	SG. 2570	177.0	42.3	5.4	9.5	2.8	2.8	0.7		23.9	90			7		5			1	1985
263	SG. 6190	234.0	61.1	6.0	12.9	2.9	2.9	1.1		26.1	120			9		5			1	1985
264	SG. 6250	901.0	160.4	2.7	24.2	1.5	1.5			17.8	130			5		7			1	1985
265	SG. 6284	336.0	62.5	2.9	9.6	1.6	1.6			18.6	110			7		5			3	1985
266	SG. 6286	415.0	106.2	5.5	22.8	3.1	3.1	0.2		25.6	140			7		5			3	1985
267	SG. 7817	274.0	43.3	1.2	2.2	1.5	1.5	2.4		15.8	90			7		3			1	1985
268	SG. 1731	459.0	91.8	1.0	4.4	0.3	0.3	3.1		20.0	80			3		7			1	1985
269	SG. 1924	371.0	71.2	0.8	2.0	0.5		2.4		19.2	60			5		5			1	1985
270	SG. 2526	344.0	72.6							21.1	80			9		5			1	1985
271	SG. 2549	318.0	63.6							20.0	40			9		7			1	1985
272	SG. 3696	300.0	70.2							23.4	50			5		5			1	1985
273	SG. 3701	318.0	56.3							17.7	50			5		5			1	1985
274	GSA 1586F	652.0	124.9	4.8	31.1	1.3	1.3	2.5		19.2	130			7		5			3	1985

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Institute of Crop Science
Federal Research Centre for Agriculture Braunschweig-Völkenrode (FAL)
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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
274	GSA 1586F	803.0	151.0	5.5	44.3	2.5	1.7	1.3	13.1	18.8	174	9		5	1	6	3	2	1	1986
274	GSA 1586F	1025.0	187.8	4.9	49.9	2.0	1.3	1.7		18.3	147	9	7	3	1	6	4		1	1987
275	GSA 1757	1117.0	268.6	5.6	62.7	1.2	1.2	3.6		24.1	180	7		5		7			1	1985
275	GSA 1757	675.0	164.5	6.7	45.4	2.4	1.7	2.6	16.3	24.4	224	3		6	1	6	3	4	1	1986
275	GSA 1757	980.0	200.5	5.6	54.9	2.0	1.3	2.4		20.5	191	7	7	2	1	9	3		1	1987
276	FS-4	715.0	153.4	6.1	43.6	2.1	2.1	2.9		21.5	140	9		7		5			1	1985
276	FS-4	774.0	168.0	7.4	57.3	3.3	2.3	1.8	13.3	21.7	186	5		3	4	4	3	4	1	1986
276	FS-4	1026.0	212.8	6.6	67.6	2.9	1.8	1.8		20.7	172	9	7	1	1	5	4		1	1987
277	FS-5	737.0	163.6	6.2	45.8	1.3	1.3	4.1		22.2	150			5		7			1	1985
277	FS-5	780.0	169.6	7.0	54.6	2.6	1.9	2.6	14.9	21.7	165	9		5	4	3	4	2	1	1986
277	FS-5	979.0	210.8	6.4	62.4	2.0	1.3	3.0		21.5	158	9	6	3	2	5	3		1	1987
278	ST-6+	883.0	220.3	6.1	53.8	1.1	1.1	4.2		25.0	200	7		5		9			5	1985
278	ST-6+	698.0	145.5	4.9	34.4	2.3	1.8	0.8	16.4	20.9	241	5		4	1	8	3	4	1	1986
278	ST-6+	1239.0	289.0	6.7	89.9	2.1	1.4	3.2		21.6	234	7	9	3	1	9	4		1	1987
279	QRAZFR ATN 1970	770.0	200.2	7.5	57.6	1.2	1.2	5.5		26.0	170	7		3		9			3	1985
279	QRAZFR ATN 1970	835.0	209.4	7.9	66.2	2.3	1.7	4.0	15.7	25.1	214	3		4	1	8	3	4	1	1986
279	QRAZFR ATN 1970	1086.0	228.7	6.0	65.2	2.1	1.4	2.5		21.1	204	7	8	2	1	9	5		1	1987
280	OASIS ATN 1977	701.0	153.9							22.0	180	3		3		9			7	1985
280	OASIS ATN 1977	524.0	157.5	6.2	32.5	2.3	1.7	2.2	24.4	30.1	235	1		3	1	9	4	3	1	1986
280	OASIS ATN 1977	374.1	150.0	5.9	22.0	1.6	1.5	2.8		40.1	240	1	7	3	1	9	3	3	1	1992
281	T-E SILOMAKER	472.0	124.3	7.2	34.0	2.9	2.0	2.3	36.7	26.3	148	3		3	6	6	4	3	1	1986
281	T-E SILOMAKER	624.5	176.9	8.1	50.8	1.0	1.0	6.1		28.3	180	1	5	4	1	5	1	3	1	1992
282	T-E MILKMAKER-T	747.0	183.5						15.4	24.6	199	3		3	7	6	5	2	1	1986
282	T-E MILKMAKER-T	830.0	201.6	7.2	59.9	1.8	1.0	4.4		24.3	173	7	6	2	3	6	5		1	1987
283	T-E YIELDMAKER	777.0	256.3	8.6	66.5	2.7	1.7	4.2	17.2	33.0	168	5		5	5	5	5	4	1	1986
283	T-E YIELDMAKER	892.0	204.5	6.8	60.4	1.8	1.1	3.9		22.9	159	7	6	2	3	5	4		1	1987
284	ROX ORANGE	594.0	111.1	8.1	48.3	3.5	2.4	2.3	10.8	18.7	189	5		5	1	5	3	1	1	1986
284	ROX ORANGE	784.0	142.5	5.8	45.4	2.9	1.7	1.2		18.2	139	9	5	2	2	6	3		1	1987
285	GEKA	569.0	119.3	8.6	48.9	3.7	2.5	2.4	11.4	21.0	198	5		7	3	7	3	1	1	1986
285	GEKA	679.0	123.6	5.9	40.1	3.1	1.9	0.9		18.2	139	9	5	2	1	6	4		1	1987
285	SOAVE	848.0	173.8	8.1	68.9	3.7	2.6	1.8	11.7	20.5	190	5		7	2	6	6	1	1	1986
286	SOAVE	546.0	98.2	5.8	31.4	3.2	1.8	0.7		18.0	135	9	4	4	2	6	5		1	1987
287	VESPA	579.0	120.3	8.7	50.3	3.3	2.1	3.4	12.9	20.8	192	5		7	2	5	6	1	1	1986
287	VESPA	583.0	111.6	6.9	40.2	3.2	1.8	1.9		19.1	148	9	5	4	1	5	5		1	1987
288	ROCE	715.0	148.9	8.1	58.2	3.9	2.9	1.4	12.3	20.8	186	5		6	1	6	3	2	1	1986
288	ROCE	568.0	99.0	6.8	38.6	3.5	2.1	1.3		17.4	141	9	4	3	1	6	4		1	1987
289	SIVOI	601.0	137.9	8.5	51.2	3.7	2.5	2.3	16.3	22.9	182	3		6	5	6	5	4	1	1986
289	SIVOI	711.0	135.7	6.5	46.1	3.3	2.2	0.9		19.1	163	9	5	2	2	7	4		1	1987
290	ROMAGNOLO	527.0	120.1	9.3	49.2	3.5	2.4	3.5	13.1	22.8	183	5		7	3	5	3	2	1	1986
290	ROMAGNOLO	601.0	122.8	7.2	42.0	3.1	1.9	2.1		20.4	152	9	5	2	2	4	5		1	1987
291	CANE BLACK AMBER WIR 164	899.0	194.5	8.9	79.7	3.6	2.5	2.8	11.7	21.6	237	3		7	3	5	3	1	1	1986
292	PEPPARD'S SOURLESS WIR 252/A	555.0	142.3	10.1	56.3	3.0	2.2	5.0	18.2	25.6	211	3		7	3	7	5	1	1	1986

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
293	ORANGE CANE VIR 326/ A										219	3		3	1	7	3	3	1	1986
294	VACONIA AMBER VIR 669	1691.0	421.7	10.8	182.3	2.7	2.1	6.0	13.2	24.9	225	3		9	1	5	3	1	1	1986
295	SORGO VIR 822	437.0	115.6	4.6	20.2	2.2	1.9	0.5	20.0	26.5	196	1		7	1	3	5	1	1	1986
297	ORANZEVOJE 160 VIR 1642	970.0	210.2	9.8	94.9	3.5	2.1	4.2	13.3	21.7	226	7		6	1	5	3	1	1	1986
298	BLACK AMBER VIR 1699	575.0	140.5	9.0	51.9	3.4	2.2	3.4	16.4	24.4	161	3		3	5	7	3	3	1	1986
299	JANTAR SLADKIJ 84/ 327 VIR 1782	545.0	123.0	9.7	53.1	3.3	2.3	4.1	12.6	22.6	236	3		7	1	7	4	1	1	1986
300	JANTAR KRASNYJ 271/ 585 VIR 1783	720.0	149.7	9.2	66.2	2.8	1.7	4.7	12.0	20.8	185	7		3	4	6	5	1	1	1986
301	UTAVLI VIR 1879	945.0	161.2	5.7	54.2	2.0	1.4	2.3	11.2	17.1	206	7		7	3	5	5	1	1	1986
302	ROOI AMBER VIR 364										191	5		7	3	5	4	1	1	1986
303	ESLAND (FORAGE) VIR 4011	566.0	120.3	9.3	52.4	3.2	2.0	4.0	12.1	21.3	198	5		5	3	5	5	1	1	1986
306	CV.133 B REX	877.0	166.0	6.2	54.0	2.4	1.6	2.1	12.5	18.9	163			6	2	5	4	1	1	1986
309	614 F	852.0	185.1	7.6	64.9	2.7	1.9	3.0	13.1	21.7	160	9		5	1	6	1	3	1	1986
309	614 F	999.0	182.7	5.8	57.9	2.1	1.2	2.5		18.3	137	9	5	2	1	7	2		1	1987
310	612 F	761.0	163.5	8.4	64.2	2.6	1.9	4.0	13.1	21.5	162	9		5	1	7	2	4	1	1986
310	612 F	618.0	115.3	5.2	31.8	2.7	2.1	0.4		18.7	134	9	6	3	1	7	2		1	1987
311	027335 BR 501	728.0	167.6	8.7	63.3	3.6	1.9	3.2	14.6	23.0	139			5	1	7	3	2	1	1986
311	027335 BR 501	465.0	92.6	6.5	30.4	3.4	1.9	1.3		19.9	108	9	5	2	1	7	3		1	1987
312	027651 BR 503	697.0	125.3	7.2	50.1	2.6	2.5	1.1	12.2	18.0	182	9		7	2	6	3	1	1	1986
312	027651 BR 503	294.0	49.0	3.7	11.0	2.2	1.6			16.7	116	9	2	2	1	7	5		1	1987
313	044130 BR 505	1276.0	341.1	6.4	82.2	2.5	1.8	2.1	11.0	26.7	134			5	2	5	2	1	1	1986
313	044130 BR 505	959.0	155.4	3.1	29.4	2.0	1.6			17.3	97	9	5	1	1	6	6		1	1987
314	033090 CMSIS 623	775.0	150.5	6.1	47.0	3.1	1.8	1.2	14.4	19.4	167			7	1	5	3	1	1	1986
314	033090 CMSIS 623	535.0	87.6	3.3	17.6	1.9	1.4			16.4	96	9	4	4	2	6	6		1	1987
315	033162 CMSIS 615	701.0	143.4	5.5	38.3	2.8	1.9	0.8	13.7	20.5	223			4	1	3	4	2	1	1986
315	033162 CMSIS 615	767.0	458.1	6.9	52.0	3.1	2.3	1.4		59.7	168	9	7	3	3	4	5		1	1987
316	069272 CMSIS 614	341.0	93.4	9.4	32.2	3.3	2.5	3.7	16.5	27.4	141	5		6	3	4	5	2	1	1986
316	069272 CMSIS 614	289.0	70.0	7.8	22.5	3.1	2.7	2.1		24.2	131	7	4	1	2	5	5		1	1987
317	044156 BR 500	855.0	183.1	7.6	55.2	2.5	1.5	3.6	12.5	21.4	198	9		5	5	4	5	1	1	1986
317	044156 BR 500	530.0	127.8	6.8	43.0	2.9	2.1	1.8		20.3	172	9	6	2	2	5	4		1	1987
318	044172 BR 504	629.0	107.1	5.4	32.7	3.0	2.2	0.2	11.7	17.0	195			5	3	5	3	1	1	1986
318	044172 BR 504	758.0	441.8	3.3	24.8	2.0	1.3			58.3	92	9	3	3	1	5	5		1	1987
319	033138 CMSIS 603	535.0	157.1	9.2	58.5	3.3	2.6	3.2	14.8	24.7	178	5		6	4	5	4	1	1	1986
319	033138 CMSIS 603	285.0	69.3	8.1	23.1	3.2	2.4	2.4		24.3	131	7	5	1	2	5	5		1	1987
320	044164 BR 502	479.0	132.4	8.4	40.1	3.2	2.4	2.8	16.9	27.7	177	5		6	2	6	3	2	1	1986
320	044164 BR 502	499.0	116.8	6.1	30.2	2.0	1.6	2.5		23.4	147	7	5	2	3	6	3		1	1987
321	069281 CMSIS 634	651.0	112.7	5.2	33.7	2.2	1.7	1.3	12.2	17.5	154			5	2	4	3	1	1	1986
321	069281 CMSIS 634	913.0	159.0	3.5	32.1	1.6	1.4	0.6		17.4	100	9	5	2	1	5	4		1	1987
322	069299 CMSIS 635	795.0	134.7	4.8	37.9	2.1	1.5	1.2	12.0	16.9	181			5	1	5	4	1	1	1986
322	069299 CMSIS 635	707.0	122.7	3.2	22.3	1.5	1.3	0.3		17.5	77	9	5	1	2	6	5		1	1987

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323	069302 CMSIS 636	648.0	121.5	6.1	39.2	2.7	1.9	1.6	13.2	18.8	202			7	4	5	3	1	1	1986
323	069302 CMSIS 636	721.0	135.5	4.7	34.0	2.4	1.9	0.5		18.8	139	9	6	1	2	5	5		1	1987
324	069311 CMSIS 637	1090.0	199.5	4.5	49.3	2.2	1.7	0.5	14.9	18.3	193			6	3	4	4	1	1	1986
324	069311 CMSIS 637	661.0	108.9	3.0	20.0	1.8	1.3			16.5	90	9	6	1	1	5	5		1	1987
325	069329 CMSIS 638	804.0	152.8	6.3	50.3	3.0	2.2	1.1	13.3	19.1	185			5	2	4	4	2	1	1986
325	069329 CMSIS 638	708.0	122.0	3.5	24.6	1.9	1.5			17.2	120	9	6	1	3	5	5		1	1987
326	069337 CMSIS 639	864.0	162.5	7.4	63.9	3.6	2.3	1.5	13.4	18.8	195			6	1	5	3	1	1	1986
326	069337 CMSIS 639	1020.0	172.7	3.6	36.8	2.1	1.5			16.9	128	9	7	2	1	6	3		1	1987
327	069345 CMSIS 640	930.0	185.8	5.6	52.0	2.8	2.0	0.8	14.2	20.0	195			5	2	4	3	1	1	1986
327	069345 CMSIS 640	850.0	146.3	4.6	39.2	2.5	2.1			17.2	112	9	7	1	1	5	5		1	1987
328	069353 CMSIS 641	767.0	137.5	5.3	40.3	2.5	1.6	1.2	13.7	17.9	127			5	1	5	3	3	2	1986
328	069353 CMSIS 641	616.0	104.0	2.9	17.8	1.7	1.2			16.9	89	9	7	1	1	7	5		1	1987
329	069361 CMSIS 642	1029.0	201.1	6.9	71.4	2.1	1.4	3.5	12.2	19.5	204			5	2	5	4	1	1	1986
329	069361 CMSIS 642	541.0	91.3	2.9	15.4	1.4	1.5	0.8		16.9	128	9	3	4	1	4	5		1	1987
330	069370 CMSIS 643	1057.0	185.1	5.2	54.7	2.6	1.7	0.9	12.0	17.5	152			3	2	5	3	2	1	1986
330	069370 CMSIS 643	852.0	131.4	1.4	12.2		1.6	3.1		15.4	71	9	5	1	2	7	4		1	1987
331	069388 CMSIS 644	638.0	108.7	5.3	33.8	2.7	1.7	1.0	11.8	17.0	157			5	2	6	3	2	2	1986
331	069388 CMSIS 644	611.0	100.5	3.2	19.6	1.5	1.5			16.5	88	9	6	1	2	7	3		1	1987
332	069396 CMSIS 629	1315.0	247.1	6.3	82.6	2.8	1.9	1.6	12.5	18.8	154			4	2	4	3	1	1	1986
332	069396 CMSIS 629	951.0	144.2	3.4	23.8	1.8	1.6			16.9	151	9	5	1	1	4	4		1	1987
333	069400 CMSIS 645	717.0	129.1	5.4	38.8	2.2	1.5	1.8	13.2	18.0	169			6	3	4	3	1	1	1986
333	069400 CMSIS 645	839.0	136.1	2.9	24.3	1.5	1.4			16.2	81	9	6	1	2	5	4		1	1987
334	069418 CMSIS 646	845.0	153.3	4.3	36.6	2.4	1.6	0.6	13.3	18.1	171			5	1	4	3	2	1	1986
334	069418 CMSIS 646	988.0	164.0	3.4	34.0	1.9	1.5			16.6	112	9	7	1	2	5	4		1	1987
335	069426 CMSIS 647	1263.0	217.5	4.5	56.6	2.3	1.6	0.6	11.5	17.2	189			6	1	4	3	1	1	1986
335	069426 CMSIS 647	1080.0	192.4	3.2	34.3	1.7	1.5			17.8	126	9	8	1	1	5	6		1	1987
336		505.0	146.0	6.5	22.6	2.8	1.9	1.8	12.0	29.2	127	9		5	5	4	4	1	1	1986
337		312.0	82.9	4.2	13.2	2.0	1.6	0.6	19.4	25.5	97	3		5	5	4	3	1	1	1986
338		285.0	80.2	5.4	18.3	3.0	2.3	1.0	22.0	28.0	94	3		4	7	6	4	1	1	1986
338		508.0	107.8	6.1	31.0	0.9	1.2	4.0		21.2	104	1	4	3	1	5	1	3	1	1992
339		368.0	85.2	4.5	16.7	2.1	1.5	0.7	16.5	23.2	84	3		4	5	5	3	4	1	1986
340		630.0	149.8	8.4	52.7	2.5	1.6	4.2	12.6	23.8	214	5		4	1	8	3	4	1	1986
340		1230.0	245.0	4.1	50.3	1.6	1.6	0.7		19.9	213	7	9	2	1	9	4		1	1987
341		660.0	139.9	7.3	49.3	1.8	1.2	4.3	12.3	21.2	201	9		5	1	5	3	1	1	1986
341		1015.0	180.4	4.8	48.7	1.9	1.7	1.2		17.8	144	9	6	1	2	6	3		1	1987
342		579.0	139.2	9.1	52.9	2.1	1.4	5.7	14.7	24.0	200	3		4	5	5	4	1	1	1986
342		632.0	134.7	6.7	42.5	3.0	2.4	1.3		21.3	180	7	5	2	2	6	5		1	1987
343		649.0	126.7	7.1	45.8	3.2	2.2	1.6	11.8	19.5	180	5		7	2	7	3	1	1	1986
343		696.0	119.6	5.8	40.0	3.0	2.2	0.6		17.2	155	9	5	3	2	6	4		1	1987
344		683.0	144.3	4.2	28.9	2.4	1.6	0.4	14.1	21.1	90	9		5	2	6	2	1	1	1986
344		398.0	75.9	4.1	16.1	1.9	1.5	0.7		19.1	78	9	4	2	1	7	3		1	1987
345		681.0	163.9	6.4	43.2	2.4	1.6	2.4	13.9	24.1	123	5		4	5	5	5	2	1	1986
345		430.0	83.0	5.2	22.3	2.4	1.9	0.9		19.3	107	9	4	3	2	3	4		1	1987
346		279.0	64.2	4.8	13.5	2.4	1.6	0.9	12.3	23.0	77			4	3	6	4	1	1	1986
347		496.0	123.7	8.0	39.6	3.8	3.0	1.1	15.3	24.9	130	3		6	6	6	4	1	1	1986

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
348		654.0	145.8	8.5	55.8	2.6	2.3	3.7	11.9	22.3	187	5		7	3	5	4	2	1	1986
348		639.0	130.9	7.7	49.1	3.0	2.8	1.9		20.5	158	9	6	3	2	5	5		1	1987
349		738.0	180.8	8.3	60.9	3.4	2.7	2.1	20.0	24.5	204	3		5	6	4	5	3	1	1986
349		784.0	160.1	5.9	46.2	2.7	2.2	1.0		20.4	197	7	5	2	3	4	3		1	1987
350		510.0	129.4	7.7	39.4	2.7	2.1	3.0	15.6	25.4	173	3		7	7	4	4	2	1	1986
351		428.0	125.9	8.0	34.4	2.4	1.5	4.2	19.2	29.4	186	1		4	5	7	5	4	1	1986
352		463.0	122.3	7.3	33.7	2.4	1.8	3.1	16.4	26.4	138	1		5	4	4	4	1	1	1986
352		564.0	181.5	7.1	40.0	2.4	1.9	2.8	22.0	32.2	253	3		7	3	6	5	1	2	1986
353		205.0	56.4	5.9	12.2	2.7	2.2	1.1		27.5	154	7	4	1	2	5	5		1	1987
354		614.0	191.4	7.4	45.3	2.7	2.4	2.3	15.3	31.2	207	3		7	2	2	3	2	1	1986
354		312.0	84.2	6.6	20.5	2.9	2.7	1.0		27.0	184	5	4	1	3	4	4		1	1987
355		497.0	151.7	9.0	44.9	2.1	1.4	5.6	19.2	30.5	217	3		7	1	2	3	6	2	1986
355		378.0	90.2	6.4	24.0	2.7	2.1	1.6		23.9	183	7	3	1	2	2	4		1	1987
356		430.0	132.4	8.3	35.9	1.9	1.5	5.0	21.0	30.8	219	3		7	1	2	3	2	2	1986
357		494.0	154.3	7.4	36.4	1.8	1.5	4.1	21.1	31.2	219	3		7	3	3	3	1	1	1986
358		253.0	83.4	7.8	20.6	3.0	2.2	2.6	17.5	31.7	228	3		7	3	5	4	4	1	1986
359		461.0	159.6	7.0	32.5	2.3	2.0	2.7	19.7	34.6	200	1		7	2	4	3	1	1	1986
360		511.0	127.1	8.0	40.9	3.2	2.3	2.5	14.8	24.9	201	3		5	2	4	4	1	1	1986
360		296.0	71.4	6.3	18.7	2.9	2.2	1.2		24.1	131	7	4	2	1	6	4		1	1987
361		377.0	131.5	6.8	25.5	2.1	1.7	2.9	28.2	34.9	228	1		6	1	2	3	2	1	1986
362		509.0	165.7	7.7	39.4	3.2	2.6	2.0	20.9	32.6	228	3		7	1	1	4	2	1	1986
363		360.0	125.2	8.1	29.1	2.4	1.9	3.8	24.9	34.8	223	3		7	5	2	3	4	1	1986
364		652.0	200.4	8.7	56.4	2.2	1.6	4.8	19.2	30.7	234	5		6	5	5	4	2	1	1986
364		479.0	112.8	7.0	33.6	2.8	2.3	2.0		22.5	184	7	4	1	3	4	5		1	1987
365		593.0	170.7	8.1	48.2	3.0	2.5	1.4	18.7	28.8	233	3		6	4	3	4	1	1	1986
366		459.0	149.3	7.4	34.0	2.6	2.2	2.7	23.5	32.5	220	3		6	5	3	5	2	1	1986
367		350.0	120.2	7.3	25.7	2.9	2.3	2.2	17.1	34.3	211	3		6	2	3	3	3	1	1986
368		381.0	138.7	8.0	30.3	2.4	2.0	3.6	24.4	35.4	221	3		7	1	2	4	3	1	1986
369		1054.0	320.2	8.8	92.5	2.9	2.3	3.0	21.3	30.4	227	5		7	4	3	3	1	1	1986
369		228.0	57.3	7.2	16.4	2.5	2.1	2.6		25.1	193	9	4	1	3	2	3		1	1987
370		414.0	102.2	5.8	23.9	2.6	2.2	1.0	16.6	24.7	94	3		6	6	5	5	1	1	1986
371		509.0	157.4	9.7	49.4	2.3	1.6	5.8	18.6	30.9	224	5		5	4	3	3	1	1	1986
371		363.0	82.7	5.3	19.3	2.1	1.6	1.6		22.8	201	9	5	1	1	4	4		1	1987
372				8.4		3.0	2.2	3.2	15.3	24.9	205	9		7	4	5	4	1	1	1986
373		447.0	170.6	6.6	29.5	2.6	2.1	1.8	28.1	38.2	213	3		5	1	2	4	3	1	1986
374		646.0	195.2	6.4	41.6	2.2	2.0	2.3	18.9	30.2	220	3		7	2	3	3	3	1	1986
374		562.0	154.4	5.7	31.8	2.4	2.1	1.2		27.5	178	7	5	1	2	1	4		1	1987
375		426.0	155.4	9.0	38.1	2.6	1.9	4.4	23.4	36.5	184	3		6	5	4	6	1	1	1986
375		294.0	80.6	5.6	16.3	2.5	1.9	1.2		27.4	145	5	3	1	2	3	5		1	1987
376		683.0	213.0	9.3	63.6	1.8	1.3	6.2	22.6	31.2	236	3		4	2	2	4	2	1	1986
376		440.0	121.4	5.7	25.3	2.3	2.0	1.5		27.6	202	7	7	1	3	1	5		1	1987
377	ZH 101	758.0	200.5	9.9	75.1	1.7	1.0	7.1	16.5	26.5	219	3		5	4	5	4	1	1	1986
377	ZH 101	681.0	154.7	5.8	39.4	2.0	1.6	2.2		22.7	214	7	6	3	2	4	4		1	1987
378	ZH 102	795.0	180.2	7.3	57.6	2.0	1.3	4.0	14.7	22.7	232	5		4	7	6	4	1	1	1986
378	ZH 102	1296.0	772.8	4.8	62.1	2.0	1.3	1.3		59.6	211	9	8	2	5	5	5		1	1987

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Evaluation Data of Sorghum bicolor from 1985-1995

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378	ZH 102	895.0	206.4	3.3	29.1	1.4	1.1	0.8		23.1	176	5		3		5	5		1	1990
379	ZH 103	857.0	202.3	8.5	72.9	3.1	2.1	3.4	13.6	23.6	220	5		4	4	6	4	4	1	1986
379	ZH 103	1132.0	240.1	6.7	75.5	2.5	1.6	2.6		21.2	204	7	8	1	1	5	2		1	1987
380	ZH 104	798.0	205.9	10.9	86.8	2.4	1.4	7.1	15.3	25.8	232	5		6	6	4	4	1	1	1986
380	ZH 104	687.0	144.6	8.4	57.8	3.5	2.2	2.8		21.1	202	7	7	2	4	4	3		1	1987
381	ZH 105	837.0	192.9	9.7	81.1	3.2	2.2	4.3	13.4	23.1	221	5		7	4	4	4	4	1	1986
381	ZH 105	1125.0	240.6	6.8	76.4	2.8	2.0	2.0		21.4	212	7	7	1	3	5	3		1	1987
381	ZH 105	903.0	152.9	4.4	39.8	1.1	1.1	2.2		16.9	163	7		1		5	1		1	1990
382	ZH 106	802.0	179.5	8.7	69.5	2.5	1.7	4.5	12.9	22.4	207	5		5	2	5	3	2	1	1986
382	ZH 106	1018.0	201.0	6.2	62.7	2.9	2.3	0.9		19.7	191	9	7	2	1	4	3		1	1987
383	ZH 107	736.0	163.0	7.4	54.6	2.1	1.2	4.1	13.8	22.2	188	5		4	2	4	2	4	1	1986
383	ZH 107	1120.0	221.1	5.4	60.7	2.5	1.9	1.0		19.7	187	9	7	3	1	5	3		1	1987
384	KORALL ZH 108	1154.0	308.0	10.6	122.2	2.1	1.5	7.0	17.4	26.7	235	3		7	5	3	5	1	1	1986
384	KORALL ZH 108	994.0	218.0	6.3	62.1	1.8	1.2	3.3		22.2	210	7	7	4	2	5	4		1	1987
384	KORALL ZH 108	487.9	151.4	12.6	61.6	1.9	1.4	9.4		31.0	204	1	6	3	1	3	3	3	1	1992
384	KORALL ZH 108	531.2	142.7	6.7	35.5	1.3	2.0	3.4		26.9	202	5	6	7	1	5	3	1	1	1993
385	ZH 111	629.0	154.2	9.5	59.6	2.1	1.4	6.0	16.0	24.5	212	3		6	3	4	4	2	1	1986
385	ZH 111	942.0	212.0	7.3	68.4	1.9	1.3	4.0		22.6	215	7	7	3	3	3	3		1	1987
386	ZH 114	611.0	119.8	8.1	49.6	2.2	1.3	4.6	12.5	19.6	188	7		5	4	4	3	1	1	1986
386	ZH 114	1035.0	207.5	5.6	57.6	1.9	1.3	2.3		20.1	182	9	6	2	1	5	3		1	1987
387	ZH 116	930.0	186.8	6.1	56.7	2.1	1.5	2.5	13.8	20.1	232	7		4	7	6	5	1	1	1986
387	ZH 116	1436.0	259.1	4.3	62.0	1.8	1.4	1.2		18.0	215	9	8	1	3	4	5		1	1987
387	ZH 116	807.0	149.2	3.3	26.4	1.0	0.9	1.4		18.5	183	7		3		5	3		1	1990
388	ZH 120	761.0	177.5	8.2	62.1	1.8	1.1	5.2	13.9	23.3	225	3		5	5	3	3	1	1	1986
388	ZH 120	976.0	212.9	7.0	68.5	2.3	1.8	3.0		21.9	197	7	7	3	2	5	3		1	1987
389	ZH 121	675.0	190.2	9.3	62.0	1.9	1.2	6.1	18.3	28.2	204	3		5	2	3	3	1	1	1986
389	ZH 121	735.0	173.1	8.0	58.7	3.0	2.0	3.0		23.6	183	5	6	5	1	3	4		1	1987
390	ZH 122	550.0	119.8	8.1	44.4	2.3	1.6	4.3	15.1	21.8	207	3		6	3	3	3	1	1	1986
390	ZH 122	641.0	145.9	7.8	50.2	2.5	1.8	3.5		22.8	182	7	5	4	2	3	3		1	1987
391	ZH 123	755.0	158.7	5.9	44.8	1.5	0.9	3.4	15.0	21.0	190	7		5	6	5	5	1	1	1986
391	ZH 123	829.0	162.7	5.9	48.6	2.3	1.6	2.0		19.6	165	9	6	3	2	5	3		1	1987
392	TR 37561	267.0	78.8	7.5	19.9	2.5	1.9	3.1	19.2	29.5	148	3		3	5	5	3	1	1	1986
396	TR 37564	237.0	77.3	7.1	16.8	2.6	2.0	2.6	22.4	32.6	160	3		7	7	3	5	1	1	1986
402	TR 39722	421.0	111.4	5.7	24.0	2.3	1.9	1.5	19.1	26.5	203	3		7	3	7	3	1	1	1986
403	TR 39713	376.0	114.9	8.5	32.0	2.9	2.3	3.3	23.2	30.6	206	3		7	1	3	5	3	1	1986
406	TR 37562	670.0	210.3	6.3	41.3	2.5	2.1	1.7	19.6	31.4	151	3		5	7	3	3	1	1	1986
408	TR 38266	308.0	100.6	5.4	15.5	2.3	1.8	1.3	24.9	32.7	272	3		7	5	3	5	1	1	1986
409	TR 38322	389.0	114.2	4.9	19.1	2.2	2.3	0.7	20.8	29.4	235	5		7	5	5	5	3	1	1986
411	KOKUSHOKU ZAIRAISHU 070003	511.0	141.1	7.4	37.6	3.2	2.8	1.4	19.1	27.6	203	3		7	2	7	3	1	1	1986
412	AKA AKAKIBI 090001	721.0	152.1	6.4	60.7	3.6	2.8	2.0	12.1	21.1	177	5		5	1	5	3	4	1	1986
413	HOUKI 040008	438.0	185.1	5.2	22.8	2.0	1.7	1.5	26.4	42.3	185	3		7	1	5	3	1	1	1986
414	ZAIRAISHU 000012	1428.0	283.2	6.6	93.5	3.0	2.2	1.4	12.4	19.8	211	3		7	3	5	5	1	1	1986
416	KOKOKOSHI 040003										180			9	1	5	3	1	1	1986
417	AKAHO 040012	361.0	137.8	7.0	25.4	2.3	1.9	2.8	26.3	38.2	218	3		7	5	3	5	1	1	1986

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418	TAKAKIBI 070009	319.0	88.1	5.1	16.3	2.3	1.9	1.0	19.7	27.6	180	3		7	3	5	5	1	1	1986
419	SEKISEDZU ZAIRAISHU 070001	554.0	121.7	6.1	33.9	3.1	2.4	0.7	14.5	22.0	203	5		6	4	6	5	4	1	1986
420	NAKAEZYOO ZAIRAI 040059	534.0	119.7	6.0	31.9	2.6	2.0	1.4	15.0	22.4	171	3		5	3	5	5	1	1	1986
421	ZAIRAISHU IWAOKA 050001	1058.0	211.2	6.7	71.0	2.7	2.1	1.9	11.6	20.0	181	9		7	3	5	3	1	1	1986
431	SUGARDRIP SA 0029	760.0	141.5	4.9	37.0	1.7	1.1	2.1	11.1	18.6	189	9	6	7	4	4	3	4	1	1986
431	SUGARDRIP SA 0029	803.0	144.7	4.4	35.6	2.0	1.5	1.0		18.0	165	9	5	4	3	5	5		1	1987
432	SWEET SUDAN SA 0030	366.0	81.4	4.5	17.8	1.5	1.1	2.3	16.3	22.3	110	3	5	6	7	5	4	1	1	1986
432	SWEET SUDAN SA 0030	417.0	86.6	4.3	17.8	1.8	1.3	1.2		20.8	94	7	5	3	4	6	4		1	1987
433	CLUBDAY SA 0163	247.0	57.7	2.9	7.2	1.3	0.9	0.7	16.4	23.3	70		5	6	1	7	3	1	1	1986
433	CLUBDAY SA 0163	158.0	94.9	4.4	6.9	1.7	1.2	1.5		60.1	43	9	3	2	2	7	4		1	1987
434	SOONER SA 0164	843.0	221.3	9.0	76.2	1.5	1.0	6.5	16.7	26.3	191	3	6	6	4	5	3	1	1	1986
434	SOONER SA 0164	566.0	114.8	6.3	35.9	2.3	1.4	2.7		20.3	156	7	5	4	1	5	2		1	1987
435	BLACK AMBER SA 0171	725.0	172.4	8.8	63.7	2.4	1.4	5.0	15.1	23.8	211	1	6	7	1	7	3	4	1	1986
435	BLACK AMBER SA 0171	509.0	105.8	5.7	29.1	2.7	1.2	1.8		20.8	150	5	3	1	1	6	5		1	1987
436	RED AMBER SA 0173	577.0	119.0	8.1	46.9	2.8	1.7	3.6	11.8	20.6	223	9	6	6	5	5	3	2	2	1986
436	RED AMBER SA 0173	746.0	139.4	6.6	49.2	2.5	1.5	2.6		18.7	186	9	6	5	1	5	4		1	1987
437	SUGARCANE SA 0252	491.0	111.4	3.5	17.0	1.4	1.0	1.1	16.9	22.7	174		6	4	7	6	5	2	1	1986
437	SUGARCANE SA 0252	492.0	105.7	4.2	20.4	1.7	1.6	0.9		21.5	119	9	5	1	4	5	5		1	1987
438	SOETRIET SA 0278	930.0	172.0	7.2	67.7	2.5	1.5	3.3	10.7	18.5	207	7	6	5	3	5	3	2	1	1986
438	SOETRIET SA 0278	896.0	160.4	5.0	44.6	2.5	1.7	0.8		17.9	186	9	6	1	1	5	5		1	1987
439	SUEI I SA 0307	629.0	164.9	6.9	43.1	2.4	1.7	2.7	17.5	26.2	223	1	7	6	1	9	5	2	1	1986
440	LA BONA SA 0308	591.0	158.5	6.4	37.9	1.1	0.8	4.5	26.5	26.8	217	1	5	7	1	9	4	1	1	1986
441	SWEET 372 SA 0309	457.0	127.0	6.5	29.8	1.4	1.0	4.2	21.0	27.8	209	1	7	7	1	8	5	2	1	1986
442	PIPER SA 0310	335.0	102.7	5.2	17.4	1.3	0.9	3.0	23.4	30.7	225	1	8	6	1	9	5	1	1	1986
443	TRIFT SA 0311	414.0	109.9	6.1	25.3	1.5	1.0	3.6	32.4	26.5	218	1	7	6	1	7	4	4	1	1986
444	GREENLEAF SA 0312	361.0	98.7	6.3	22.6	2.0	1.4	2.9	19.6	27.4	198	1	7	6	1	9	4	4	1	1986
445	ADVANCE SA 0315										238	3	7	7	1	5	3	3	1	1986
446	DON SALVADOR SA 0317	703.0	234.9	5.1	35.1	1.2	0.9	3.1	26.5	33.4	260	1	7	5	1	8	3	1	1	1986
446	DON SALVADOR SA 0317	681.0	191.8	5.0	34.3	2.0	1.6	1.5		28.2	198	5	7	1	1	8	2		1	1987
447	LA BONA SA 0319	474.0	128.2	4.5	21.4	1.3	1.1	2.2	20.3	27.0	211	1	8	6	1	9	5	4	1	1986
448	LOCAL COLLECTION SA 1325	709.0	161.1	6.0	42.2	2.0	1.3	2.7	14.8	22.7	208	9	6	6	3	6	4	2	1	1986
448	LOCAL COLLECTION SA 1325	676.0	136.1	4.9	30.1	2.4	1.8	0.6		20.1	170	9	6	3	1	5	4		1	1987
452	IS 01347	231.0	65.7	6.2	14.4	2.3	1.5	2.5	18.9	28.5	89	3		5	7	7	5	3	1	1986
457	IS 03513	528.0	148.1	9.2	48.5	1.6	1.1	6.5	19.0	28.1	186	5		3	1	5	3	3	1	1986
458	IS 03515	447.0	135.6	8.4	37.5	1.5	1.1	5.8	20.7	30.3	159	5		5	1	7	3	3	1	1986
465	IS 08344	346.0	106.8	7.4	25.7	2.2	1.2	4.1	22.5	30.9	212	9		7	5	3	5	5	1	1986
467	IS 08662	311.0	85.7	7.4	22.9	2.3	1.7	3.4	18.6	27.6	106	3		3	7	5	5	3	1	1986
468	IS 09708	305.0	84.7	6.9	21.0	1.8	1.3	3.8	19.4	27.8	123	3		7	7	5	5	1	1	1986
471	IS 12736	495.0	120.0	4.8	23.9	2.3	1.7	0.8	17.6	24.3	201	9		7	3	3	5	7	1	1986
472	IS 12737	329.0	122.7	4.7	15.5	1.6	1.4	1.7	28.1	37.3	232	3		7	5	5	5	1	1	1986

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
475	IS 12741	455.0	135.5	7.1	32.5	1.4	1.0	4.8	20.7	29.8	262	5		7	7	5	5	3	3	1986
476	IS 12742	480.0	159.5	7.6	36.5	1.5	1.1	5.1	24.2	33.2	259	3		7	1	3	3	7	1	1986
477	IS 12744	489.0	138.1	6.5	31.6	1.7	1.2	3.6	20.5	28.3	244			7	1	3	3	7	1	1986
479	IS 13437	340.0	92.6	4.9	16.5	1.2	0.9	2.8	19.8	27.2	89	5		3	3	7	5	1	1	1986
480	IS 13444	743.0	176.4	5.4	40.1	1.6	1.0	2.8	16.1	23.7	83	3		5	3	7	3	3	1	1986
481	IS 13446	367.0	94.3	4.8	17.7	1.6	0.9	2.3	17.5	25.7	86	9		5	3	5	5	1	1	1986
482	IS 13448	384.0	104.3	5.6	21.5	1.7	1.3	2.7	18.5	27.2	102	5		5	7	5	5	1	1	1986
483	IS 13802	413.0	94.2	5.8	22.9	1.7	1.3	2.8	14.8	22.8	133	5		3	7	3	3	1	1	1986
492	IS 20959	485.0	119.9	6.3	30.6	1.7	1.1	3.5	16.6	24.7	150			3	5	5	3	1	1	1985
494	IS 21479	376.0	99.8	5.4	20.5	1.2	0.8	3.4	18.8	26.5	169	9		7	3	7	3	1	1	1986
496	IS 22070	369.0	105.8	5.8	21.4	2.1	1.8	1.9	18.9	28.7	84	3		3	5	3	3	5	1	1986
499	IS 22312	592.0	106.0	5.4	32.2	2.8	1.5	1.2	11.0	17.9	208	9		5	7	5	5	3	1	1986
503	IS 23519	490.0	109.6	3.2	16.0	1.6	1.1	0.5	15.9	22.4	112			5	1	7	5	1	1	1986
504	IS 23687	537.0	93.1	2.2	12.2	1.2	0.7	0.8	13.6	17.3	139			5	1	7	3	1	1	1986
507	IS 22299	379.0	119.2	7.7	29.0	1.5	1.0	5.2	21.1	31.4	158	9		5	1	7	3	3	1	1986
508	IS 22307	516.0	122.0	4.0	20.7	1.5	1.2	1.4	15.7	23.7	141	5		7	7	3	3	3	1	1986
509	IS 22308	610.0	137.9	5.4	32.6	1.6	1.0	2.9	14.7	22.6	213			7	1	5	5	1	1	1986
510	IS 22314	574.0	121.5	3.8	21.7	1.5	0.9	1.3	14.7	21.2	180			7	3	5	5	1	1	1986
511	IS 22315	475.0	129.3	6.7	31.9	1.7	1.0	4.0	11.7	27.2	219	9		5	5	5	5	3	1	1986
516	IS 22400	296.0	77.3	7.1	21.1	1.9	1.4	2.8	18.0	26.1	89	5		5	1	7	3	5	1	1985
523	IS 22472	480.0	112.2	7.6	36.3	1.7	1.3	4.6	14.7	23.4	144	7		5	3	7	3	1	1	1986
525	IS 22474	344.0	91.9	7.2	24.7	2.3	1.6	3.3	17.4	26.7	114	5		5	1	5	5	3	1	1986
526	IS 22475	500.0	106.6	5.6	27.6	2.3	1.8	1.5	13.5	21.3	162	3		3	5	5	5	1	1	1986
528	IS 22477	515.0	115.5	5.7	29.3	1.8	1.3	2.6	15.0	22.4	138	9		5	5	5	3	1	1	1986
529	IS 22479	378.0	94.5	6.0	22.6	2.9	2.2	0.9	15.9	25.0	141	5		5	3	5	3	1	1	1986
541	PA-62-19	461.0	104.5	5.6	25.9	2.1	1.7	1.8	14.4	22.7	119			7	5	5	5	3	1	1986
545	PA-70	601.0	102.4	3.0	18.0	1.6	1.1	0.3	11.2	17.0	158			7	3	5	5	3	1	1986
550	IS 03295										186			9	1	9	5	1	7	1986
551	IS 03615										173			9	1	9	4	2	7	1986
552	IS 03701										160			9	1	9	5	1	7	1986
553	IS 03743										165			9	1	9	5	2	7	1986
554	IS 03829										139			9	1	9	5	2	7	1986
555	IS 04088										146			9	1	9	3	4	6	1986
556	IS 04322										192			8	1	8	4	1	7	1986
563	IS 05255										164			9	1	9	5	1	7	1986
564	IS 05466										120			9	1	9	5	2	7	1986
565	IS 05525										149			9	1	9	5	1	7	1986
566	IS 06102										213	5		9	1	9	4	4	6	1986
569	IS 06271										174			7	1	9	5	2	7	1986
570	IS 06335										140			9	1	9	5	1	7	1986
575	IS 07230										114			9	1	9	5	2	7	1986
578	IS 08551										168			8	1	9	4	1	7	1986
579	IS 08596										178	5		9	1	9	4	2	7	1986
583	IS 08955										203	3		8	1	9	6	1	7	1986
584	IS 08961										195	5		9	1	9	7	3	7	1986

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
587	IS 09116										208	5		9	1	9	5	2	7	1986
588	IS 09118										181	5		9	1	9	5	3	7	1986
591	IS 09268										196	3		8	1	9	6	3	7	1986
595	IS 09401										192	3		8	1	9	5	2	7	1986
596	IS 09404										195	3		9	1	9	6	1	7	1986
597	IS 09426										188	3		9	1	8	6	4	7	1986
598	IS 09455										206	5		9	1	9	5	2	7	1986
600	IS 00131	300.0	89.0	7.3	21.8	2.8	2.3	2.1	19.8	29.7	82	3		5	5	7	5	1	1	1986
601	IS 00271	578.0	141.5	7.8	45.0	2.6	1.7	3.4	13.4	24.5	163			5	1	5	3	1	1	1986
602	IS 02331	581.0	119.6	6.4	37.4	2.7	1.8	1.9	11.6	20.6	205			3	1	5	3	1	1	1986
603	IS 02525	256.0	59.7	4.9	12.4	2.0	1.3	1.6	14.4	23.3	210			3	3	5	5	1	1	1986
605	IS 02552	381.0	117.7	7.6	28.8	2.4	1.7	3.5	19.6	30.9	210	5		5	3	7	5	1	1	1986
606	IS 02556	400.0	87.2	6.1	24.4	2.6	1.9	1.6	13.0	21.8	238	5		3	3	5	5	1	1	1986
607	IS 02569	371.0	101.8	7.1	26.3	3.0	2.0	2.2	18.0	27.4	185			5	5	5	3	1	1	1986
608	IS 02572	589.0	132.9	7.7	45.1	2.5	1.8	3.3	11.6	22.6	155			7	3	5	3	1	1	1986
609	IS 04617	760.0	160.2	6.2	46.7	2.7	1.9	1.5	10.7	21.1	175			7	5	5	5	1	1	1986
610	IS 04751	580.0	171.0	8.6	49.7	2.6	2.2	3.8	18.5	29.5	177	3		7	1	3	3	1	1	1986
611	IS 04755	589.0	142.1	7.4	43.7	2.7	1.8	2.9	16.2	24.1	183	9		7	5	5	5	1	1	1986
612	IS 06936	456.0	156.1							34.2	185	5		5	5	5	3	1	1	1986
613	IS 06952	422.0	128.8	9.6	40.5	4.0	3.1	2.4	18.0	30.5	182	9		5	5	5	5	1	1	1986
615	IS 07073	381.0	103.7	8.0	30.4	3.6	2.5	1.9	16.6	27.2	172			7	1	7	3	1	3	1986
616	IS 07077	567.0	157.3	6.9	38.8	3.2	2.4	1.2	16.3	27.7	213	3		5	3	5	3	1	1	1986
617	IS 07080	409.0	104.9	6.2	25.3	3.2	2.3	0.6	15.5	25.6	120			7	1	7	3	1	1	1986
618	IS 08157	385.0	94.6	5.9	22.7	2.2	2.1	0.4	14.6	24.6	119			7	5	5	3	1	1	1986
619	IS 08218	440.0	120.9	7.5	32.8	3.3	2.4	1.7	15.8	27.5	198	9		5	5	7	3	1	1	1986
620	IS 09538	559.0	141.6	5.7	31.7	2.7	2.1	0.9	16.6	25.4	167			5	5	5	3	1	1	1986
621	IS 09629	541.0	156.1	6.8	36.5	2.9	2.1	1.7	16.9	28.9	170	5		5	5	5	5	1	1	1986
622	IS 09645	792.0	263.3	5.3	41.9	2.3	1.5	1.5	13.5	33.2	128			7	1	5	5	1	1	1986
623	IS 09699	917.0	204.8	7.1	65.4	2.9	2.0	2.2	11.7	22.3	159			5	3	5	5	1	1	1986
625	IS 09734	597.0	161.3	6.3	37.7	2.7	1.9	1.7	16.4	27.0	225	3		5	5	5	5	1	1	1986
627	IS 09889	592.0	149.4	9.7	57.4	3.0	2.3	4.4	13.6	25.2	185	3		5	5	3	5	1	1	1986
628	IS 09890	445.0	124.4	8.1	36.1	3.2	2.4	2.6	14.3	28.0	162	5		5	7	5	3	1	3	1986
629	IS 09901	435.0	108.1	6.3	27.2	3.3	2.2	0.7	15.2	24.9	118			7	1	7	3	1	1	1986
630	IS 09911	374.0	95.9	5.7	21.4	3.4	1.8	2.6	16.6	25.6	195			5	1	5	3	1	1	1986
631	IS 10050	523.0	105.6	5.1	26.4	3.1	2.0		11.4	20.2	190			5	3	5	3	1	1	1986
632	IS 10690	482.0	100.3	3.9	18.7	2.2	1.6		13.9	20.8	179			5	1	7	5	1	1	1986
633	IS 10954	529.0	111.3	4.7	25.0	2.4	1.8	0.5	14.0	21.0	193			5	1	5	3	1	1	1986
634	IS 11093	427.0	115.3	5.8	24.7	2.9	1.9	1.0	16.6	27.0	185			5	7	5	7	1	1	1986
636	IS 12292	462.0	123.8	7.1	32.9	3.3	2.5	1.3	15.7	26.8	121	5		5	5	5	3	1	1	1986
637	IS 13622	487.0	97.6	3.4	16.6	2.0	1.4		13.2	20.0	242			5	3	5	3	1	1	1986
639	IS 14463	174.0	51.1	7.1	12.3	3.3	2.4	1.4	14.8	29.4	176	3		7	3	5	5	1	1	1986
640	IS 14529										143									1986
641	IS 14548										204									1986
642	IS 14594	524.0	113.0	4.7	24.4	2.9	1.8		12.8	21.6	203			5	5	3	3	1	1	1986
642	IS 14790	516.0	95.9	2.0	10.4	1.1	0.7	0.2	13.7	18.6	223			5	5	5	5	1	3	1986

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645	IS 14942	434.0	121.7	6.9	30.1	2.9	1.9	2.1	21.5	28.1	188			7	1	5	3	1	1	1986
648	IS 15428	403.0	123.0	6.6	26.5	2.8	1.8	2.1	21.3	30.5	185	5		7	1	5	5	3	1	1986
649	IS 15448	384.0	98.7	7.5	28.7	3.3	2.3	1.9	16.6	25.7	155			7	1	5	5	1	1	1986
650	IS 15455	556.0	139.1	7.2	40.1	3.3	2.2	1.8	16.0	25.0	162			7	1	7	3	1	1	1986
651	IS 16054	435.0	120.9	8.3	35.9	4.0	3.1	1.1	19.0	27.8	228	7		5	5	3	5	1	1	1986
652	IS 19107	477.0	99.5	5.6	26.6	2.6	1.7	1.3	14.8	20.9	209			7	5	3	5	3	1	1986
653	IS 19130	438.0	115.6	6.9	30.3	2.8	2.0	2.1	15.9	26.4	165	5		5	3	5	5	1	1	1986
654	IS 19214	301.0	74.9	5.6	16.7	3.0	2.0	0.6	16.0	24.9	125			5	3	7	5	1	1	1986
656	IS 19273	367.0	89.6	7.8	28.6	4.1	2.9	0.8	15.3	24.4	154	5		5	1	5	5	1	1	1986
657	IS 19587	264.0	71.9	8.4	22.3	2.7	2.0	3.7	17.5	27.3	105			7	3	5	3	1	1	1986
658	IS 20503	120.0	35.5	3.7	4.4	1.8	1.4	0.4	24.2	29.5	85	3		7	3	5	3	1	1	1986
659	IS 20510	364.0	101.1	8.0	29.1	4.1	3.2	0.7	19.6	27.8	140	3		7	1	3	3	1	1	1986
660	IS 20557	274.0	85.6	3.5	9.5	1.7	1.8	0.0	21.7	31.2	65	5		7	1	5	3	1	1	1986
661	IS 20563	230.0	61.8	6.1	14.1	2.9	2.6	0.7	18.2	26.9	97	5		7	5	5	3	1	1	1986
662	IS 20888	848.0	175.3	3.7	31.6	1.8	1.3	0.7	15.8	20.7	203			5	1	7	5	1	1	1986
663	IS 20962	1014.0	277.7	6.4	64.8	2.9	1.9	1.6	18.3	27.4	175			5	3	7	3	1	1	1986
664	IS 20963	579.0	164.0	6.9	39.8	3.4	2.8	0.7	20.6	28.3	178			5	5	5	5	1	1	1986
665	IS 20974	526.0	154.8						20.5	29.4	165			5	3	5	3	1	1	1986
666	IS 20984	448.0	138.4						21.9	30.9	215			5	5		5	1	1	1986
667	IS 21005	571.0	167.5						11.7	29.3	155			5	5	5	5	3	1	1986
668	IS 21023	578.0	159.7	7.4	42.8	3.8	2.8	0.8	21.6	27.6	188			5	5	5	5	3	1	1986
669	IS 21100	770.0	219.1	6.8	67.4	4.6	3.4	0.8	8.3	28.5	192			7	3	3	5	1	1	1986
670	IS 21229	605.0	178.8	8.1	49.3	4.2	3.3	0.6	21.3	29.6	194			5	3	2	3	1	1	1986
672	IS 21260	567.0	158.7	6.7	37.8	3.2	2.6	0.8	19.7	28.0	199			7	3		3	1	1	1986
673	IS 21991	547.0	119.4	4.4	23.9	2.3	1.4	0.7	17.4	21.8	142			5	3		5	1	1	1986
674	IS 22636	202.0	33.2	2.8	5.6	1.6	1.2		12.5	16.4	105							1	1	1986
675	KELLER	918.0	183.8	5.0	45.8	2.3	1.8	0.9		20.0	182	9	7	4	1	5	4		1	1987
676	HYBRID NO II	826.0	180.6	3.4	28.1	1.5	1.3	0.6		21.8	188	7	6	1	3	5	4		1	1987
778	KK 1	737.0	159.3	3.9	29.0	2.2	1.7	0.1		21.6	165	7	5	1	1	5	3		1	1987
779	KK 2	584.0	111.0	3.2	18.7	1.9	1.2	0.1		19.0	145	9	5	1	2	5	5		1	1987
780	KK 3	704.0	122.8	3.5	24.6	2.1	1.3	0.1		17.4	129	9	5	2	1	5	2		1	1987
781	KK 5	651.0	122.6	4.7	30.7	2.6	1.8	0.4		19.0	172	9	5	2	1	6	4		1	1987
782	KK 6	681.0	131.6	6.0	40.9	2.6	1.7	1.7		19.3	168	9	5	5	1	5	3		1	1987
783	KK 7	805.0	481.2	6.4	51.1	2.9	2.3	1.2		59.8	167	9	4	6	3	5	3		1	1987
784	KK 8	568.0	112.9	5.8	32.7	2.1	1.7	2.0		19.9	167	9	6	2	1	6	5		1	1987
785	KK 9	653.0	122.4	5.4	34.9	2.6	2.1	0.6		18.7	97	9	4	4	2	5	5		1	1987
786	KK 10	508.0	102.3	6.0	30.6	2.0	2.0	2.0		20.1	148	9	5	3	2	5	5		1	1987
787	KK 11	448.0	77.8	5.2	23.3	2.2	1.3	1.8		17.4	145	9	5	1	1	7	7		1	1987
788	KK 12	428.0	75.5	5.3	22.7	2.6	1.7	1.0		17.6	137	9	4	2	1	5	5		1	1987
789	KK 13	456.0	86.0	5.5	25.2	2.7	1.6	1.3		18.9	131	9	4	5	1	6	4		1	1987
790	KK 14	685.0	110.5	5.3	36.0	2.5	1.6	1.2		16.1	139	9	5	3	1	5	4		1	1987
792	KK 16	839.0	159.1	5.1	42.7	2.5	1.2	1.4		19.0	123	9	5	1	1	5	5		1	1987
794	KK 18	780.0	464.3	5.3	41.7	3.1	1.7	0.6		59.5	176	9	6	1	1	6	5		1	1987
796	KK 20	588.0	114.7	6.1	35.7	2.4	1.5	2.2		19.5	198	9	5	3	2	5	5		1	1987
799	KK 23	694.0	119.7	4.4	30.4	1.6	0.9	1.8		17.2	121	9	5	2	2	5	5		1	1987

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NO	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
800	KH 24	671.0	123.1	5.1	34.4	2.5	1.6	1.0		18.4	171	7	6	1	2	5	5		1	1987
801	KS 25	642.0	117.8	4.4	28.3	2.3	1.1	1.0		18.4	97	9	4	3	2	5	4		1	1987
804	KS 29	459.0	79.0	3.8	17.5	1.6	0.8	1.4		17.2	77	9	4	3	1	7	4		1	1987
806	KS 30	723.0	116.5	3.1	22.1	2.1	0.8	0.2		16.1	101	9	4	3	1	7	4		1	1987
807	KH 31	665.0	113.7	5.2	34.9	2.9	1.9	0.5		17.1	139	9	5	5	2	5	4		1	1987
808	KS 32	641.0	101.0	4.3	27.3	2.4	1.2	0.6		15.8	91	9	5	3	1	6	4		1	1987
809	KH 33	611.0	367.0	6.7	40.9	2.2	1.3	3.2		60.1	188	9	6	1	1	5	5		1	1987
812	KH 36	618.0	125.3	7.4	45.6	2.2	1.5	3.7		20.3	187	5	5	1	1	6	4		1	1987
815	KH 40	579.0	106.8	4.2	24.3	2.4	1.5	0.3		18.4	121	9	5	2	1	6	4		1	1987
817	KS 42	821.0	147.1	8.1	66.1	2.9	2.0	3.2		17.9	181	9	6	1	3	5	5		1	1987
820	KS 46	756.0	136.2	5.4	40.8	2.9	1.6	1.0		16.0	164	9	5	5	2	5	4		1	1987
822	KH 48	797.0	135.8	6.1	48.9	3.9	2.0	0.3		17.0	156	9	6	2	2	5	5		1	1987
823	KS 49	628.0	103.1	2.9	18.3	1.9	0.8	0.2		16.4	122	9	5	1	1	7	5		1	1987
824	KH 50	465.0	78.9	3.9	18.0	2.6	1.1	0.2		17.0	96	9	4	1	2	7	6		1	1987
826	KS 55	357.0	78.1	6.2	22.2	2.0	1.2	3.1		21.9	125	5	4	3	1	5	4		1	1987
829	KS 59	502.0	101.8	5.3	26.6	1.8	1.4	2.1		20.3	129	9	4	2	2	3	5		1	1987
830	HER 79-01	759.0	152.6	6.1	45.9	2.4	1.9	1.8		20.1	168	7	5	1	2	4	4		1	1987
834	HER 80-04	518.0	101.7	7.4	38.4	1.7	1.4	4.4		19.6	196	7	6	1	3	5	4		1	1987
835	HER 80-06	610.0	162.2	5.8	46.7	1.4	1.2	3.2		20.0	180	9	7	1	2	5	3		1	1987
837	HER 80-07	561.0	122.4	5.1	28.8	0.9	1.0	3.3		21.8	155	9	5	1	2	6	3		1	1987
838	HER 80-08	553.0	107.9	6.0	33.3	1.2	1.9	2.9		19.5	142	9	5	1	1	5	6		1	1987
839	HER 80-09	516.0	110.9							21.5	141	9	4	2	1	6	3		1	1987
840	HER 80-10	473.0	101.2							21.4	152	9	4	3	2	5	6		1	1987
841	HER 80-11	509.0	94.1	5.3	26.9	0.9	0.8	2.6		18.5	172	9	5	4	2	5	3		1	1987
842	HER 80-12	706.0	133.6	5.3	37.5	1.0	2.0	3.4		18.9	170	9	6	1	3	4	3		1	1987
845	HER 81-01	422.0	103.9							24.6	147	5	4	1	2	3	5		1	1987
846	HER 81-03	364.0	72.5	6.3	22.9	1.1	1.2	4.0		19.9	115	9	3	1	1	7	5		1	1987
847	HER 81-04	527.0	118.2	6.7	35.3	1.3	1.4	4.0		22.4	155	9	5	1	1	7	4		1	1987
848	HER 81-05	707.0	136.6	4.7	33.1	1.5	1.3	1.9		19.3	140	9	5	3	1	7	3		1	1987
849	HER 81-06	562.0	94.9	4.7	26.5	1.6	1.3	1.9		16.9	125	9	5	2	1	7	5		1	1987
851	HER 81-36	492.0	97.5	5.5	27.2	1.1	1.1	3.4		19.8	146	9	4	3	1	5	5		1	1987
852	HER 81-09	565.0	108.8	4.8	27.1	1.5	1.0	2.4		19.3	135	9	5	2	1	5	3		1	1987
853	HER 81-10	822.0	150.9	5.1	41.5	2.2	1.3	1.6		18.4	178	9	7	1	2	6	3		1	1987
855	HER 81-12	227.0	49.2	6.0	13.7	2.3	2.0	1.7		21.7	124	9	3	2	1	6	4		1	1987
856	HER 82-01	544.0	110.3	5.3	28.6	2.4	2.0	0.9		20.3	155	7	4	2	1	5	4		3	1987
860	HER 82-05	549.0	116.7	5.2	28.6	3.0	2.1	0.2		21.3	191	7	5	4	1	6	4		1	1987
861	HER 82-06	589.0	108.9	4.8	28.5	2.2	1.7	0.9		18.5	148	9	4	2	1	5	3		1	1987
863	HER 82-08	436.0	88.1	5.5	24.0	3.1	2.3	0.2		20.2	167	7	4	3	3	5	6		1	1987
865	HER 82-10	544.0	102.7	5.8	31.4	2.2	1.7	1.9		18.9	136	9	5	3	1	7	4		1	1987
866	HER 82-11	795.0	478.6	4.8	38.1	2.6	1.9	0.2		60.2	121	9	3	2	1	5	4		1	1987
868	HER 82-13	547.0	329.0	6.2	33.9	2.8	2.3	1.2		60.2	153	7	5	3	1	4	4		1	1987
869	HER 82-14	622.0	113.1	4.4	27.4	2.1	1.4	0.9		18.2	134	9	5	1	1	5	4		1	1987
870	HER 82-15	268.0	39.5	6.7	18.0	2.3	1.6	2.8		14.7	127	9	4	2	2	7	5		1	1987
872	HER 82-17	519.0	315.3	6.7	34.7	2.1	1.7	2.9		60.8	137	9	5	1	2	7	5		1	1987
874	HER 82-19	448.0	271.6	7.8	35.0	2.4	2.1	3.3		60.6	153	7	5	1	1	6	5		1	1987

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875	HER 82-20	516.0	104.9	6.4	33.0	2.3	2.0	2.0		20.3	159	9	4	2	1	4	6		1	1987
876	HER 82-21	561.0	114.1	5.5	30.8	2.0	1.7	1.8		20.3	153	7	4	1	2	5	4		1	1987
879	ROV 84-26	876.0	149.6	5.1	44.5	2.5	1.8	0.8		17.1	194	9	7	1	3	4	4		1	1987
880	ROV 84-82	770.0	145.5	6.2	47.4	2.5	2.3	1.4		18.9	175	9	6	2	3	4	4		3	1987
885	ROV 84-34	926.0	153.5	4.5	41.8	1.9	1.7	1.0		16.6	182	9	7	3	1	4	3		1	1987
886	SWEET SIOUX IV	790.0	161.5							20.4	194	7	6	3	1	8	3		1	1987
887	HER 81-02	745.0	181.9	6.7	50.1	2.2	2.0	2.5		24.4	138	7	4	1	1	4	5		1	1987
890	KH 1500	418.0	94.6	5.2	21.8	2.1	1.9	1.2		22.6	104	9	5	2	1	4	2		1	1987
894	ATX 623 • GREENLEAF	619.0	130.1	4.0	25.0	1.5	1.3	1.2		21.0	191	9	5	3	2	8	5		1	1987
896	ATX 623 • CHIHASORG	549.0	105.5	5.8	31.9	2.4	2.0	1.4		19.2	164	9	5	2	2	5	4		1	1987
900	ATX 623 • BMR 12	586.0	113.7	5.9	34.4	2.2	1.7	2.0		19.4	163	7	5	1	4	3	4		1	1987
901	A 1388 • RIO	807.0	138.5	5.7	45.8	2.5	1.9	1.3		17.2	188	9	6	2	2	4	3		1	1987
902	A 155 • E35-1	490.0	102.0	5.4	26.3	2.3	2.0	1.1		20.8	147	9	5	2	3	3	1		1	1987
903	A 160 • E35-1	603.0	135.0	5.4	32.6	2.4	1.4	1.6		22.4	166	9	5	1	3	4	3		1	1987
907	SART	411.0	81.9	5.1	20.9	2.4	2.0	0.7		19.9	151	7	4	3	1	5	7		1	1987
910	A (ATLAS) • BRANDES	421.0	74.6	5.1	21.5	2.5	2.0	0.7		17.7	129	9	3	4	2	6	3		1	1987
911	A (ATLAS) • SART	884.0	158.2	6.8	60.2	2.6	1.9	2.3		17.9	184	9	6	3	1	5	4		1	1987
914	KH 960	232.0	48.6	4.5	10.4	2.0	1.6	0.9		21.0	122	7	3	1	1	5	3		1	1987
917	A (ATLAS) • RIO	863.0	161.5	5.4	46.5	2.2	1.6	1.6		18.7	174	9	7	3	1	6	4		1	1987
919	KS 1048	397.0	92.2	4.2	16.6	2.0	1.8	0.4		23.2	146	9	5	3	2	6	4		1	1987
920	A (ATLAS) • WRAY	1227.0	209.3	5.6	68.5	2.8	2.2	0.6		17.1	145	9	8	3	1	6	3		1	1987
921	KH 1056	445.0	96.0	6.2	27.4	2.3	1.8	2.1		21.6	114	7	5	1	1	5	2		1	1987
922	A (ATLAS) • HEGARI	556.0	122.5	4.9	27.0	1.7	1.4	1.7		22.0	161	7	5	3	2	7	3		1	1987
923	ATX 623 • KELLER	879.0	161.9	5.8	51.0	2.0	1.8	2.0		18.4	187	9	6	3	1	4	3		1	1987
925	ATX 623 • KH 1500	917.0	167.7	4.2	38.2	2.0	1.6	0.6		18.3	200	9	6	3	4	5	5		1	1987
927	A 1388 • TX? • 430	509.0	96.6	7.2	36.5	2.2	1.9	3.1		19.0	118	9	4	1	2	5	3		1	1987
999	ZE 201	591.4	166.6	10.8	63.7	1.8	1.5	7.5		28.2	242	7	7	3	2	3	3	3	1	1992
999	ZE 201	640.6	164.9	6.0	28.6	0.9	2.0	3.1		25.7	181	5	4	5	1	7	4	1	1	1993
1000	ZE 213	753.0	155.6	5.4	40.3	1.1	0.9	3.3		20.7	180	5		5		5	5		1	1990
1001	ZE 243	564.0	158.3	7.7	43.5	1.3	1.3	5.2		28.1	186	7		5		5	3		3	1990
1002	ZE 530	777.0	214.2	8.0	62.5	1.0	1.1	6.0		27.6	195	9		3		5	3		3	1990
1002	ZE 530	397.0	141.2	9.4	37.5	1.7	1.5	6.3		35.6	244	6	8	3	4	2	3	3	2	1992
1002	ZE 530	562.8	170.1	5.3	29.7	0.8	1.4	3.1		30.2	243	7	8	3	2	5	2	1	1	1993
1003	KORALL	604.0	139.7	8.4	50.6	1.3	1.0	6.1		23.1	162	5		3		5	3		3	1990
1003	KORALL	494.0	132.4	5.6	27.6	1.1	1.9	2.6		26.8	187	5	4	7	1	5	3	1	1	1993
1003	KORALL	519.0	190.9	10.3	52.5	0.9	0.8	8.6		36.8	247	4	9	1	1	5	2	3	4	1994
1005	IS 10954 261	868.0	145.0	4.0	34.8	1.8	1.3	1.0		16.7	56			5		5	1		3	1990
1006	IS 14594 270	1718.0	252.7	2.2	37.5	0.9	0.8	0.5		14.7	116			7		5	1		1	1990
1009	93183 412	964.0	170.5	4.7	44.8	1.9	1.6	1.2		17.7	132			9		5	3		1	1990
1010	93167 416	1137.0	186.0	3.2	36.3	1.2	1.0	0.9		16.4	114			9		3	3		1	1990
1011	93437 490	768.9	193.1	1.4	10.4	0.8	0.6	0.0		25.1	245	0	7	5	1	5	3	1	1	1993
1012	93325 424	811.3	227.2	2.0	16.5	1.0	0.5	0.6		28.0	275	9	8	4	1	5	3	1	1	1993
1014	E 040	592.5	142.9	1.4	8.5	0.9	0.5	0.0		24.1	237	0	6	3	1	5	3	1	1	1993
1014	E 040	1039.0	230.0	3.8	39.9					25.3	318	9	9	1	2	4	1	1	1	1994
1014	E 040	621.2	127.5							20.5	251	7	6	1	5	3	3	5	7	1995

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1015	H 045	531.0	142.3	2.8	14.9	1.1	1.3	0.5		26.8	211	9	5	3	1	5	3	1	1	1993
1015	H 045	1189.0	327.0	4.7	55.9	1.0	0.8	2.9		38.3	359	7	9	1	5	5	3	3	1	1994
1015	H 045	627.9	130.2							20.7	243	7	5	1	5	3	3	7	3	1995
1016	H 128	598.4	159.9	2.6	15.7	0.9	0.9	0.8		26.7	269	9	7	5	1	4	3	1	1	1993
1016	H 128	1082.0	335.0	4.0	43.5	1.2	0.8	2.2		30.8	357	7	9	1	5	4	2	3	1	1994
1016	H 128	599.5	108.9							18.7	204	7	5	3	3	1	1	5	1	1995
1017	H 132	528.9	127.8	2.4	12.8	0.4	1.2	0.8		24.2	213	0	6	3	1	7	3	1	1	1993
1018	H 133	851.9	213.2	4.2	36.1	0.7	1.6	1.9		25.0	270	0	7	5	2	5	3	1	1	1993
1018	H 133	1139.0	325.0	3.8	43.7	1.1	0.9	1.8		57.8	353	9	9	1	6	4	3	5	2	1994
1018	H 133	532.7	94.8							17.8	231	7	5	3	5	3	1	5	1	1995
1019	H 143	655.8	213.7	4.2	27.7	0.7	1.3	2.2		32.6	279	7	8	5	3	4	3	1	1	1993
1020	E 172	781.8	158.3	2.4	18.6	0.3	1.1	1.0		20.2	208	0	6	3	1	7	3	1	1	1993
1021	E 174	600.9	142.8	2.6	21.3	0.8	1.4	1.4		23.8	247	9	7	5	1	5	4	1	1	1993
1021	E 174	1411.0	362.0	4.9	68.4	1.1	0.9	2.9		40.1	363	9	9	1	1	5	4	4	1	1994
1021	E 174	643.0	127.0							19.5	249	7	5	3	3	3	1	5	3	1995
1022	E 176	640.3	180.3	4.4	27.9	0.6	1.6	2.0		28.2	130	9	7	5	1	5	3	1	1	1993
1023	HK 506	503.0	118.8	2.7	13.5	0.9	1.4	0.4		23.6	172	9	4	3	1	6	5	1	1	1993
1024	H 29	848.6	206.5	4.5	38.3	0.8	1.6	2.1		24.3	222	9	4	7	1	5	5	1	1	1993
3001	A1 X ATX	1124.0	242.3	6.3	70.9	1.5	1.2	3.6		21.6	224	7	8	3	2	5	3		1	1987
3002	A1 X AT1	1047.0	219.6	4.8	50.2	1.6	1.3	1.9		21.0	203	7	7	3	1	5	2		1	1987
3003	A1 X AT2	778.0	155.4	6.5	50.2	1.3	0.8	4.3		20.0	208	7	5	2	2	4	5		1	1987
3004	A1 X AT3	1102.0	232.2	6.3	66.2	1.3	0.9	3.8		21.1	189	7	7	3	2	5	5		1	1987
3005	A1 X AT4	990.0	207.9	6.4	63.6	1.3	0.9	4.2		21.0	196	9	7	3	1	5	4		1	1987
3006	A1 X BT1	1115.0	240.3	4.1	46.2	1.3	1.1	1.8		21.6	213	7	8	2	2	5	3		1	1987
3007	E3 X AT2	971.0	180.9	3.2	30.6	1.0	0.7	1.4		18.6	195	9	7	1	2	5	6		1	1957
3008	E3 X AT3	1117.0	196.9	2.7	30.4	1.2	0.9	0.6		17.6	177	9	7	2	3	5	5		1	1987
3009	E3 X AT4	1108.0	196.6	3.5	38.2	1.3	1.0	1.2		17.7	164	9	7	1	3	5	4		1	1987
3010	E3 X BT1	1277.0	225.4	4.7	59.4	1.4	1.1	2.1		17.7	209	9	9	1	3	5	5		1	1987
3011	E3 X BT2	842.0	162.2	6.1	50.9	1.6	1.1	3.3		19.3	190	9	7	3	2	5	3		1	1987
3012	A4 X ATX	866.0	169.5	5.6	48.2	1.5	1.2	2.9		21.9	195	7	7	2	3	4	4		1	1987
3013	A4 X AT1	797.0	173.4	6.2	49.6	1.7	1.3	3.3		21.8	166	9	5	2	2	5	3		1	1987
3014	A4 X AT2	1046.0	231.6	5.7	59.5	1.7	1.2	2.8		22.1	193	7	7	1	2	6	3		1	1987
3015	A4 X AT3	941.0	204.3	6.2	58.2	1.9	1.3	3.0		21.7	194	9	7	1	1	5	3		1	1987
3016	A4 X AT4	802.0	185.5	5.5	44.4	1.7	1.3	2.5		23.0	180	9	6	2	2	5	4		1	1967
3017	A4 X BT1	923.0	200.6	5.3	49.3	1.8	1.4	2.1		21.7	192	9	7	1	2	5	4		1	1987
3018	A4 X BT2	956.0	202.7	5.5	52.9	2.7	2.1	0.7		21.2	193	9	7	1	3	5	4		1	1987
3019	A5 X ATX	332.0	80.5	4.7	15.7	1.7	1.7	1.3		24.3	140	7	5	1	3	3	4		1	1987
3020	A5 X AT1	459.0	111.0	4.9	23.0	1.6	1.5	1.8		22.7	142	7	5	3	2	4	3		1	1987
3021	A5 X AT2	508.0	310.0	4.4	22.6	1.7	1.6	1.1		61.0	128	7	5	2	2	4	3		1	1987
3022	A5 X AT3	626.0	140.6	5.0	31.1	1.6	1.6	1.8		22.5	131	7	5	1	3	4	3		1	1987
3023	A5 X AT4	624.0	180.5	5.3	43.9	1.6	1.3	2.4		21.9	159	7	6	2	1	4	2		1	1987
3024	A5 X BT1	989.0	195.7	5.7	56.5	1.8	1.8	2.1		19.8	203	9	7	2	4	5	4		1	1987
3025	A5 X BT2	663.0	407.2	6.9	46.0	1.8	1.5	3.6		61.4	166	7	5	2	4	2	3		1	1987
3026	A6 X AT3	1023.0	620.5	6.9	70.6	1.9	1.7	3.4		60.7	191	7	7	3	1	5	6		1	1987
3027	A6 X BT1	1095.0	248.8	5.5	60.6	1.3	1.2	3.0		22.7	205	7	7	2	2	5	4		1	1987

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3028	A7 X ATX	977.0	215.3	6.3	61.8	1.6	1.6	3.2		22.0	184	7	6	3	5	5	5		1	1987
3029	A7 X AT2	859.0	184.7	4.4	37.5	1.5	1.3	1.6		21.5	172	7	5	1	3	5	3		1	1987
3030	A7 X BT2	887.0	537.1	6.4	56.6	1.4	1.2	3.8		60.6	177	7	6	3	5	5	4		1	1987
3031	A8 X ATX	820.0	500.7	5.1	41.6	1.2	1.0	2.9		61.1	146	7	7	5	1	5	3		1	1987
3032	A8 X AT1	914.0	196.5	4.9	44.5	1.5	1.4	2.0		21.5	203	7	6	4	1	5	2		1	1987
3033	A8 X AT4	1032.0	223.0	4.6	47.9	1.2	0.9	2.5		21.6	188	7	7	2	2	4	3		1	1987
3034	A8 X BT1	832.0	184.7	6.1	50.8	1.5	1.9	2.7		22.2	186	7	7	2	1	5	2		1	1987
3035	A8 X BT2	941.0	193.0	5.9	55.1	0.9	1.5	3.5		21.2	216	7	8	4	2	4	3		1	1987
3036	A14 X ATX	942.0	209.0	6.7	63.5	2.9	2.6	1.2		22.2	208	7	7	2	2	5	4		1	1987
3037	A14 X AT1	1011.0	216.4	6.5	65.5	2.9	2.4	1.2		21.4	207	7	7	3	1	5	3		1	1967
3038	A14 X BT1	954.0	222.5	6.3	60.4	2.9	2.4	1.0		23.3	199	7	7	1	2	5	3		1	1987
3039	A15 X AT2	803.0	172.0	6.3	50.8	2.8	2.1	1.4		21.4	184	7	6	2	2	5	5		1	1987
3040	A15 X AT3	655.0	148.4	6.5	42.8	2.8	2.2	1.5		22.7	186	7	5	1	1	5	3		1	1987
3041	A15 X AT4	1135.0	234.7	6.8	77.6	2.4	1.8	2.6		20.7	199	7	7	2	2	6	3		1	1987
3042	A15 X BT1	938.0	206.0	6.5	61.2	2.3	1.8	2.4		22.0	196	7	7	2	3	6	4		1	1987
3043	A15 X BT2	1240.0	261.3	3.8	47.1	1.9	1.5	0.4		21.1	211	7	7	2	3	5	5		1	1987
3044	A16 X ATX	1093.0	250.5	3.3	36.3	1.5	1.4	0.4		22.9	216	7	7	3	3	5	3		1	1987
3045	A16 X AT2	518.0	108.6	4.8	24.7	2.0	1.5	1.3		21.0	130	9	4	2	2	4	3		1	1987
3046	A16 X BT2	930.0	204.8							22.0	215	7	6	4	3	4	4		1	1987
3047	A9 X ATX	978.0	227.7							23.3	173	7	8	2	1	4	4		1	1987
3048	A9 X AT4	919.0	199.5	6.7	61.8	2.3	2.2	2.2		21.7	195	7	7	2	1	3	4		1	1987
3049	A9 X BT1	800.0	182.9	7.4	58.9	2.1	1.9	2.3		22.9	110	7	7	2	2	5	3		1	1987
3050	A10 X ATX	982.0	216.8	6.1	59.8	2.2	2.0	1.9		22.1	248	7	7	2	2	5	4		1	1987
3051	A10 X AT1	1041.0	216.0	6.9	71.5	2.3	1.9	2.7		20.8	156	9	7	2	2	5	4		1	1987
3052	A10 X AT2	819.0	178.3	6.5	53.0	2.1	2.2	2.2		21.8	188	7	6	2	1	5	5		1	1987
3053	A10 X AT3	877.0	183.0	5.7	50.1	1.6	1.4	2.8		20.9	180	9	7	2	1	5	5		1	1987
3054	A10 X BT1	879.0	190.8	6.9	60.7	1.7	1.5	3.7		21.7	177	9	5	2	1	4	3		1	1987
3055	A10 X BT2	997.0	215.3	6.4	63.3	1.3	1.1	4.0		21.6	203	7	7	3	1	5	3		1	1987
3056	A11 X ATX	662.0	154.3	5.2	34.1	1.3	1.1	2.9		23.3	158	7	5	1	4	5	3		1	1987
3057	A11 X AT4	681.0	150.1	6.3	42.0	1.4	1.4	3.5		22.1	156	7	5	2	2	5	3		1	1967
3058	A11 X BT1	662.0	145.4	6.4	42.4	1.9	1.4	3.1		22.1	151	7	6	2	3	5	4		1	1987
3059	A12 X ATX	941.0	204.3	6.6	62.0	2.0	1.5	3.1		21.7	202	7	6	2	2	5	4		1	1987
3060	A12 X AT3	864.0	180.7	7.4	64.1	1.7	1.5	4.2		20.9	199	7	6	2	3	5	4		1	1987
3061	A12 X AT4	1059.0	234.8	5.6	59.1	0.6	1.0	4.1		22.2	196	7	7	1	1	6	3		1	1987
3062	A13 X ATX	807.0	187.0	5.6	45.0	0.6	1.2	3.8		23.2	190	7	7	1	3	5	3		1	1987
3063	A13 X AT3	711.0	153.2	6.5	46.1	0.7	1.1	4.6		21.5	174	7	5	1	3	5	4		1	1987
3064	A17 X ATX	943.0	210.0	5.1	48.0		0.7	4.4		22.3	196	7	7	2	4	5	3		1	1987
3065	E14 X ATX	1004.0	206.7	5.4	54.0		1.1	4.3		20.6	198	9	6	3	2	4	4		1	1987
3066	E24 X ATX	894.0	202.1	5.6	49.8	0.5	1.1	4.0		22.7	185	7	7	1	5	4	4		1	1987
3067	E25 X AT3	1026.0	632.1	5.3	54.6	0.4	1.1	3.9		61.6	217	7	7	2	2	5	4		1	1987
3068	E25 X AT4	1117.0	250.8	5.1	57.3		0.8	4.4		22.5	203	7	8	1	3	4	4		1	1987
3069	E26 X ATX	870.0	197.1	4.6	40.4	0.4	1.0	2.2		22.7	196	7	6	2	4	5	5		1	1987
3070	E27 X ATX	1075.0	221.5	6.6	71.2		0.9	5.7		20.6	180	7	7	1	5	5	5		1	1987
3071	E28 X ATX	888.0	540.2	5.9	52.4		1.1	4.6		60.8	192	7	6	1	5	4	4		1	1987
3072	E29 X ATX	952.0	195.3	6.7	63.7		0.8	5.9		20.5	195	7	6	2	5	3	6		1	1987

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3073	E31 X ATX	1248.0	254.1	7.8	97.0		0.8	7.0		20.4	199	9	5	3	2	6	3		1	1987
3074	E29 X ATX	1137.0	695.1	6.4	73.1		0.6	5.8		61.1	160	7	4	2	1	3	1		1	1987
3075	E39 X AT3	900.0	196.7	5.2	47.1	1.1	0.3	3.9		21.9	186	7	6	2	1	4	5		1	1987
3076	E40 X ATX	1137.0	270.0	6.5	73.3		0.8	5.6		23.8	226	7	8	3	3	4	4		1	1987
3077	E43 X ATX	1012.0	225.1	6.2	63.2	1.5	1.0	3.8		22.2	219	7	9	2	3	4	3		1	1987
3078	E44 X ATX	1026.0	620.8	5.7	58.8	1.7	1.2	2.8		60.5	203	9	7	3	1	5	4		1	1987
3079	E46 X ATX	537.0	125.9	7.2	38.4	2.1	1.5	3.7		22.4	179	9	4	3	2	5	3		1	1987
3080	E48 X ATX	1123.0	263.6	5.8	64.9	1.8	1.6	2.4		23.5	227	7	9	2	4	5	4		1	1987
3081	E48 X AT2	751.0	164.2	5.7	42.7	1.7	1.8	2.8		21.9	171	7	5	1	2	5	3		1	1987
3082	F6 X ATX	1042.0	639.7	5.7	58.9	1.7	1.1	2.8		61.4	190	7	7	2	4	6	4		1	1987
3083	F8 X ATX	393.0	92.3	4.9	19.7	1.6	1.2	2.1		23.1	139	7	4	2	2	4	3		1	1987
3084	F8 X AT2	503.0	111.1	5.1	25.8	1.7	1.1	2.3		22.1	153	7	4	3	2	5	3		1	1987
3085	F6 X AT3	602.0	145.4	5.0	30.1	1.5	1.1	2.5		24.2	135	7	4	4	3	5	4		1	1987
3086	F6 X AT4	574.0	126.1	5.3	30.3	1.7	1.2	2.4		22.0	145	7	5	1	2	4	4		1	1987
3087	F8 X BT1	603.0	130.0	5.8	35.0	1.6	1.1	3.0		21.6	153	7	5	1	3	4	3		1	1987
3088	F6 X BT2	725.0	165.5	5.5	39.7	1.4	0.9	3.2		22.8	159	7	5	1	5	5	5		1	1987
3089	F9 X ATX	690.0	156.3	3.5	24.3	1.2	1.0	1.3		22.7	172	7	5	2	1	5	3		1	1987
3090	F10 X ATX	842.0	182.9	5.3	44.5	1.8	1.2	2.3		21.7	225	7	6	2	2	7	5		1	1987
3091	F13 X ATX	427.0	94.0	5.7	24.3	1.0	1.0	3.7		22.0	97	7	5	2	5	5	6		1	1987
3092	F15 X ATX	883.0	196.6	3.4	29.9	1.3	0.9	1.1		22.3	210	5	7	3	4	5	6		1	1987
3093	F17 X ATX	732.0	179.6	5.5	40.3	1.1	1.1	3.4		24.5	222	7	7	2	3	3	3		1	1987
3094	F18 X ATX	1029.0	233.1	7.8	80.2	1.7	1.7	4.3		22.7	242	7	9	1	5	4	4		1	1987
3095	F19 X ATX	1003.0	258.0	6.6	66.2	1.7	1.2	3.6		25.7	266	7	9	1	2	4	3		1	1987
3096	F20 X ATX	693.0	214.5	5.3	36.9	1.7	1.5	2.2		31.0	229	5	7	1	3	3	5		1	1987
3097	F21 X ATX	627.0	174.4	6.1	36.9	0.8	1.1	4.2		27.4	226	5	7	1	3	5	4		1	1987
3098	F21 X AT2	627.0	142.8	6.4	39.9	1.2	1.0	4.1		22.8	165	7	5	2	2	4	4		1	1987
3099	F21 X AT3	817.0	186.4	6.4	52.0	1.6	1.0	3.8		22.8	190	7	7	2	2	4	3		1	1987
3100	F21 X BT2	798.0	192.2	5.9	47.2	1.9	1.2	2.8		24.2	207	5	6	2	3	4	4		1	1987
3101	F23 X ATX	793.0	176.0	7.3	57.5	1.4	1.1	4.8		22.2	175	7	6	3	4	5	5		1	1987
3102	F23 X AT3	514.0	109.9	6.0	30.6	1.9	1.2	2.9		21.4	139	7	5	2	3	5	5		1	1987
3103	F24 X ATX	1165.0	263.1	8.1	94.3	1.9	1.2	5.1		22.6	225	7	8	2	4	4	3		1	1987
3104	F24 X AT3	844.0	188.3	6.9	58.0	1.5	1.1	4.3		22.3	200	7	6	1	2	5	4		1	1987
3105	F26 X ATX	1225.0	270.2	4.6	56.4	1.3	1.2	2.1		22.1	240	7	9	1	2	5	4		1	1967
3106	F27 X ATX	972.0	205.5	6.8	66.2	1.7	1.1	4.0		21.1	207	9	7	4	2	4	2		1	1987
3107	F27 X AT3	490.0	294.6	7.1	34.9	0.8	1.1	5.2		60.1	133	5	5	1	4	4	4		1	1987
3108	F28 X ATX	1199.0	262.5	7.1	84.5	2.3	1.7	3.1		21.9	238	7	9	2	3	5	4		1	1987
3109	F29 X ATX	1023.0	218.2	6.0	61.4	1.6	1.2	3.2		21.3	226	5	8	1	2	4	3		1	1987
3110	F29 X AT3	786.0	477.8	4.0	31.4	0.8	0.6	2.6		60.8	199	7	5	3	1	5	3		1	1987
3111	F30 X ATX	1116.0	222.9							21.0	220	7	9	1	5	5	4		1	1987
3112	F30 X AT3	792.0	170.8							21.6	190	7	6	1	3	6	4		1	1987
3113	F32 X ATX	1020.0	606.5							59.5	226	7	7	2	3	5	3		1	1987
3114	F33 X ATX	1246.0	263.3							21.1	240	7	9	3	3	5	3		1	1987
3115	F34 X ATX	1202.0	255.1							21.2	221	7	8	3	3	4	2		1	1987
3116	I4 X ATX	885.0	167.9							21.2	202	7	6	7	4	5	3		1	1987
3117	I4 X AT2	680.0	142.6							21.0	160	7	5	2	2	5	3		1	1987

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Evaluation Data of Sorghum bicolor from 1985-1995

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3118	I4 X AT3	536.0	116.4							21.7	153	7	5	2	2	5	5		1	1987
3119	I5 X AT3	873.0	198.4							22.7	192	7	7	2	3	5	5		1	1987
3120	I5 X AT4	959.0	215.2							22.4	198	7	7	2	2	5	4		1	1987
3121	I6 X ATX	988.0	217.4							22.0	198	7	7	3	1	3	3		1	1987
3122	I7 X ATX	893.0	195.8							21.9	184	7	7	2	2	5	3		1	1987
3123	I7 X AT3	1019.0	228.1							22.4	181	7	6	2	2	5	4		1	1987
3124	I7 X AT4	1090.0	229.9							21.1	154	7	7	1	2	5	4		1	1987
3125	I7 X BT2	992.0	223.4							22.5	186	7	7	2	2	5	5		1	1987
3126	I8 X ATX	695.0	161.5							23.2	182	7	5	4	5	4	5		1	1987
3127	I8 X AT2	643.0	140.4							21.8	157	7	5	2	2	5	4		1	1987
3128	I8 X AT3	535.0	122.3							22.9	142	7	5	3	3	5	4		1	1987
3129	I8 X AT4	603.0	121.8							20.2	167	9	5	2	1	5	3		1	1987
3130	P1 X ATX	917.0	228.0							24.9	234	5	7	2	2	8	4		1	1987
3131	P4 X ATX	1226.0	261.5							21.3	230	7	8	1	4	5	3		1	1987
3132	P5 X ATX	1031.0	218.2							21.2	206	7	7	3	2	5	3		1	1987
3133	P6 X ATX	870.0	191.0							22.0	190	7	7	2	4	5	5		1	1987
3134	P7 X ATX	771.0	172.0							22.3	227	7	5	2	3	5	4		1	1987
3135	P8 X ATX	892.0	191.4							21.5	173	7	4	4	3	5	3		1	1987
3136	P8 X AT3	938.0	566.7							60.4	195	7	7	4	3	5	3		1	1987
3137	P8 X AT4	961.0	198.6							20.7	185	7	7	1	3	6	4		1	1987
3138	P9 X ATX	1025.0	232.2							22.7	210	5	7	1	2	5	3		1	1987
3139	P10 X ATX	923.0	202.8							22.0	197	7	8	3	4	5	4		1	1987
3140	P10 X AT3	829.0	184.5							22.3	179	9	6	2	3	5	3		1	1987
3141	P11 X ATX	844.0	182.3							21.6	179	7	7	2	2	4	2		1	1987
3142	P12 X ATX	851.0	176.8							20.8	175	7	7	3	3	5	4		1	1987
3143	P13 X ATX	864.0	190.9							22.1	190	7	6	3	3	5	4		1	1987
3144	P14 X ATX	1122.0	244.2							21.8	218	7	8	1	3	5	4		1	1987
3145	P14 X AT3	1174.0	230.8							19.7	196	9	8	1	2	6	5		1	1987
3146	P14 X AT4	763.0	155.3							20.4	161	7	6	2	2	5	3		1	1987
3147	P16 X ATX	1132.0	249.0							22.0	224	7	8	2	4	5	4		1	1987
3148	P19 X ATX	887.0	198.4							22.4	190	9	7	2	2	4	3		1	1987
3149	P20 X ATX	965.0	200.6							20.8	193	7	7	1	2	5	4		1	1987
3150	P21 X ATX	860.0	191.0							22.2	183	7	5	3	2	5	2		1	1987
3151	P24 X ATX	823.0	198.8							24.2	211	5	7	3	2	6	3		1	1987
3152	P25 X ATX	912.0	201.8							22.1	217	5	7	3	3	4	3		1	1987
3153	P26 X ATX	595.0	131.7							22.1	162	7	5	2	3	4	5		1	1987
3154	P26 X AT3	497.0	111.8							22.5	130	7	5	2	2	5	5		1	1987
3155	P27 X ATX	721.0	160.6							22.3	167	7	5	2	3	4	4		1	1987
3156	P28 X ATX	1148.0	237.3							20.7	203	9	7	3	2	4	3		1	1987
3157	P30 X ATX	718.0	179.1							24.9	250	7	9	2	5	3	3		1	1987
3158	P33 X ATX	1075.0	236.5							22.0	226	7	8	1	3	5	4		1	1987
3159	P35 X ATX	1033.0	238.9							23.1	218	5	9	1	4	4	4		1	1987
3160	P40 X ATX	568.0	122.5							21.6	204	9	6	1	2	5	3		1	1987
3161	G1 X ATX	670.0	159.1							23.7	199	7	7	1	3	4	5		1	1987
3162	G8 X ATX	522.0	102.1							19.6	151	7	4	2	3	5	3		1	1987

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3163	G10 X ATX	585.0	141.0							24.1	175	7	5	2	4	4	4		1	1987
3164	G12 X ATX	666.0	147.8							22.2	150	7	5	2	4	5	5		1	1987
3165	G13 X ATX	732.0	155.0							21.2	155	7	6	1	3	5	3		1	1987
3312	B11 X AT1	1134.0	245.4							21.6	234	7	9	1	3	4	3		1	1987
3313	B11 X AT2	817.0	177.7							21.8	200	9	6	1	2	4	4		1	1987
3314	B11 X AT3	779.0	169.7							21.8	199	9	7	2	4	6	3		1	1987
3315	B11 X AT4	1013.0	220.1							21.7	223	9	8	1	3	4	4		1	1987
3316	B11 X BT1	955.0	226.1							23.7	218	7	7	1	4	4	5		1	1987
3317	B11 X BT2	1049.0	232.1							22.1	226	7	9	1	5	4	4		1	1987
3349	1425	955.0	193.3							20.2	183	9	8	2	1	5	4		1	1987
3350	1426	976.0	199.3							20.4	178	9	7	3	1	5	3		1	1987
3351	1427	1072.0	226.3							21.1	205	7	8	1	2	5	3		1	1987
3352	1428	942.0	189.2							20.1	208	9	7	3	2	5	4		1	1987
3353	1429	995.0	226.8							22.8	209	7	7	3	3	5	4		1	1987
3354	1440	977.0	206.1							21.1	199	7	8	3	3	5	3		1	1987
3355	1426	1120.0	222.7							19.9	202	7	8	2	2	5	3		1	1987
3361	1042	902.0	196.3							21.8	207	7	7	3	1	4	2		1	1987
3362	1442	989.0	194.2							19.6	165	9	7	3	1	5	3		1	1987
3364	1446	1058.0	201.4							19.0	204	9	7	3	2	4	3		1	1987
3365	1449	829.0	174.4							21.0	173	9	7	3	4	5	4		1	1987
3366	1450	754.0	158.1							21.0	161	7	7	2	2	5	4		1	1987
3367	1453	786.0	160.3							20.4	174	9	6	1	2	4	4		1	1987
3369	1455	954.0	202.9							21.3	194	7	7	2	3	5	5		1	1987
3374	1465	770.0	176.8							23.0	181	7	6	1	1	6	4		1	1987
3377	1472 AF	1258.0	216.6							17.2	202	9	7	1	4	5	6		1	1987
3378	1474	1259.0	231.7							17.1	198	9	8	1	1	5	4		1	1987
3379	1475	1354.0	240.6							17.8	207	9	9	1	4	5	4		1	1987
3381	X1414	937.0	173.7							18.5	185	9	6	3	1	5	3		1	1987
3382	X1417	914.0	179.9							19.7	191	7	6	3	2	5	3		1	1987
3383	X1413	973.0	198.4							20.4	205	7	5	3	2	5	3		1	1987
3384	X1416	883.0	166.5							18.9	182	9	7	1	1	5	3		1	1987
3385	EX1	947.0	212.9							22.6	216	7	7	2	2	9	4		1	1987
3387	EX2	1093.0	233.8							21.4	217	7	7	2	1	9	2		1	1987
3388	EARLY ORANGE	1014.3	235.0	8.0	81.5	2.2	1.6	4.3		23.2	270	7	6	5	1	5	3	3	1	1992
3390	CC 270	586.5		4.9	28.9	1.4	0.9	2.6			165		8	3	1	5	1	3	1	1992
3392	CC 280	675.5	170.1	6.8	45.7	1.1	1.0	4.7		25.2	189	9	5	3	3	3	3	3	1	1992
3393	CC 489	561.2	168.7	4.7	26.4	1.6	0.9	2.2		30.1	266	7	7	3	3	3	3	3	1	1992
3394	CC 627	680.9	255.3	5.4	37.0	1.1	1.2	3.1		37.5	273	7	7	3	1	5	3	3	1	1992
3396	QUERI 8 33/3545-11111	432.0	133.5	5.5	23.8	1.3	1.6	2.7		30.9	222	1	6	3	3	5	5	3	1	1992
3397	COLMAN 70/9685-11	790.0	196.9	8.6	67.9	1.5	1.0	6.1		24.9	264	3	6	3	1	5	3	3	1	1992
3399	SOR 1/88	667.5	223.0	7.0	46.8	1.4	1.3	4.3		33.4	272	7	7	3	1	1	5	3	1	1992
3400	SOR 4/88	343.5	123.1	7.0	23.9	1.0	1.0	5.0		35.8	292	7	7	3	1	5	3	3	3	1992
3401	SOR 9/88	511.0	147.7	5.0	25.6	1.2	1.0	2.8		28.9	161	3	6	3	1	7	5	3	5	1992
3402	SOR 20/88	450.5	136.4	7.7	34.7	1.2	1.0	5.5		30.3	162	3	5	3	1	3	1	3	3	1992

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3403	SOR 6/91	223.5	70.1	5.9	13.1	2.5	2.0	1.4		31.4	116	1	4	3	1	3	3	3	1	1992
3404	SOR 21/91	361.0	103.2							28.6	142	1	5	3	1	5	5	3	1	1992
3405	84-S-130-2	501.9	152.4	9.4	47.0	1.9	1.6	5.9		30.4	231	2	6	5	1	3	1	3	1	1992
3406	ICSV-91003	612.2	198.7	11.4	69.6	1.4	1.1	8.9		32.5	193	7	6	3	1	3	2	3	1	1992
3407	84-S-130	553.3	188.5	10.1	55.8	1.0	1.0	8.1		34.1	204	7	7	3	1	5	1	3	3	1992
3408	IS-22144	601.4	160.3	9.8	59.1	1.2	1.0	7.7		26.7	230	9	8	3	1	5	1	3	1	1992
3409	SSV-108	568.2	198.7	7.7	43.8	1.1	0.9	5.7		35.0	239	5	8	3	1	4	2	3	1	1992
3410	IS-18456	666.0	180.8	8.2	54.9	1.1	1.0	6.1		27.1	233	7	8	3	1	5	1	3	1	1992
3411	ICSV-91001	718.2	184.1	7.3	52.5	1.1	0.9	5.3		25.6	219	9	8	3	1	4	1	3	1	1992
3412	IS-4776	617.6	205.3	12.0	73.9	0.4	0.5	11.1		33.3	251	3	8	3	1	4	1	3	1	1992
3416	90957	697.3	194.9	4.7	32.6	2.1	2.2	0.4		28.0	194	7	4	3	1	9	5	3	3	1992
3417	90966	495.6	134.2	1.4	7.2	0.5	1.0	0.0		27.0	207	5	6	3	1	9	3	3	7	1992
3419	90983	336.4	84.5	1.2	3.9	0.5	0.7	0.0		25.1	206	3	5	3	1	9	5	3	7	1992
3420	90986	490.1	129.6	1.6	7.9	0.6	1.0	0.0		26.5	177	7	6	3	1	9	5	3	7	1992
3422	92942	316.0	109.5	5.0	15.9	0.8	0.8	3.5		34.7	239	3	6	3	1	5	3	3	5	1992
3435	SA 01	372.4	122.3	5.6	21.7	1.1	0.9	3.8		33.1	78		5	3	2	5	2	3	1	1992
3436	SA 05	480.0	196.8	6.3	30.0	1.2	1.0	4.1		41.0	128	9	6	3	1	5	1	3	1	1992
3437	SA 07	501.6	203.8	3.1	15.8	0.8	0.7	1.7		40.6	83		6	3	1	5	2	3	1	1992
3438	SA 08	550.7	238.9	6.9	38.1	0.8	0.6	5.5		43.4	152		6	3	1	6	1	3	1	1992
3439	SA 09	353.2	141.1	6.2	21.9	0.6	0.7	4.9		40.0	150	7	7	3	2	6	2	3	1	1992
3440	SA 10	321.4	121.2	5.7	18.2	0.6	0.4	4.6		37.7	98	5	4	3	1	6	2	3	1	1992
3441	SA 12	775.7	212.4	4.2	32.6	0.8	0.6	2.9		27.4	172	5	7	3	1	7	2	3	1	1992
3442	SA 15	363.9	99.9	2.7	9.9	0.9	0.6	1.2		27.5	52		4	3	1	6	1	3	1	1992
3443	SA 16	623.1	163.3	4.2	26.3	0.8	0.8	2.6		26.2	166	7	7	3	5	6	3	3	1	1992
3444	SA 18	384.9	101.9	3.5	13.6	0.8	0.8	1.9		26.5	97		5	3	5	6	3	3	1	1992
3445	SA 19	529.1	145.9	5.4	28.7	0.7	0.6	4.1		27.6	160	9	7	3	4	7	2	3	1	1992
3446	SA 20	688.5	175.8	4.6	33.3	0.9	0.7	3.3		25.5	169		7	3	5	7	3	3	1	1992
3447	SA 21	558.7	140.2	4.8	26.8	0.6	0.6	3.6		25.1	162		7	3	5	7	4	3	1	1992
3448	SA 24	266.5	54.5	5.1	13.5	0.5	0.6	3.6		20.4	114		5	3	5	6	2	3	1	1992
3449	SA 25	539.7	115.6	2.9	15.8	0.7	0.6	1.7		21.5	110		6	3	2	5	2	3	1	1992
3450	SA 28	650.1	173.6	4.3	28.1	0.5	0.7	2.8		26.7	243	9	6	3	2	6	2	3	1	1992
3451	SA 30	332.9	105.5	7.1	22.5	0.8	0.6	5.6		31.7	117	3	4	3	3	7	3	3	1	1992
3452	SA 31	406.1	121.8	3.7	15.1	1.1	0.9	1.7		30.0	113	9	6	3	4	7	4	3	1	1992
3453	SA 32	612.9	172.4	6.8	41.7	1.3	1.1	4.3		28.1	234	7	7	3	1	7	1	3	1	1992
3454	SA 33	275.2	106.1	5.6	15.3	1.1	1.1	2.4		38.6	192	5	7	3	3	6	3	3	1	1992
3455	SA 34	401.9	113.4	7.2	29.1	1.0	0.9	5.4		28.2	162		6	3	3	6	3	3	1	1992
3456	SA 37	247.8	86.0	4.0	10.0	0.9	0.7	2.4		34.7	116	3	5	3	2	5	3	3	1	1992
3457	SA 39	396.2	116.8	4.3	17.1	1.1	1.2	2.1		29.5	110	4	4	3	3	7	2	3	1	1992
3458	SA 44	80.3	23.9	0.7	0.6	0.2	0.5	0.0		29.7	109	3	1	3	1	9	1	3	1	1992
3459	SA 45	373.6	105.3	6.5	24.1	0.8	0.9	4.8		28.2	125	3	5	3	2	7	2	3	1	1992
3460	SA 49	443.1	156.5	6.9	30.4	1.3	1.0	4.6		35.3	237	4	7	3	1	9	1	3	1	1992
3461	SA 50	365.8	108.1	6.4	23.2	0.5	0.5	5.4		29.6	126	4	4	3	1	7	1	3	1	1992
3462	SA 51	329.7	103.4	8.8	28.9	1.5	1.1	6.1		31.4	145	3	3	3	1	7	1	3	1	1992
3463	SA 53	390.5	135.0	6.9	26.8	1.7	0.9	4.2		34.6	187	8	5	3	5	7	3	3	1	1992
3464	SA 55	428.5	114.3	6.2	26.6	0.6	0.6	5.0		26.7	118	8	5	3	5	7	3	3	1	1992

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NO	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3465	SA 59	537.5		3.0	16.2	0.7	0.7	1.6			64		5	3	3	7	3	3	1	1992
3466	SA 61	601.5		5.5	33.3	1.6	1.3	2.7			142		7	3	5	7	3	3	1	1992
3467	SA 62	601.5	172.6	4.6	27.6	0.5	0.6	3.5		28.7	202	7	8	3	5	5	3	3	1	1992
3468	SA 64	537.2	145.0	6.3	33.8	1.0	0.6	4.7		27.0	193	9	7	3	5	5	3	3	1	1992
3469	SA 67	655.4	159.6	4.6	29.8	0.9	0.8	2.9		24.4	92		5	3	5	7	3	3	1	1992
3471	SA 076	385.5	91.8	1.8	7.0	0.3	0.8	0.7		23.8	143	0	4	6	1	4	3	1	1	1993
3473	SA 081	373.5	100.7	3.0	11.1	0.6	1.2	1.2		27.0	123	0	4	4	1	7	3	1	1	1993
3474	SA 086	257.3	68.7	4.1	10.7	1.1	1.9	1.2		26.7	157	9	4	5	1	3	4	1	1	1993
3475	SA 088	329.5	83.8	2.0	6.7	0.6	0.8	0.6		25.4	166	0	4	3	3	7	4	1	1	1993
3476	SA 096	264.5	81.2	1.2	3.3	0.2	0.4	0.7		30.7	134	0	4	7	1	9	5	1	1	1993
3477	SA 100	245.8	64.8	1.0	2.5	0.3	0.3	0.4		26.4	86	0	4	7	1	5	4	1	1	1993
3478	SA 109	228.5	71.4	5.2	11.8	1.3	2.2	1.7		31.3	122	3	4	3	1	7	3	1	1	1993
3479	SA 110	241.6	85.1	1.9	4.6	0.4	0.6	1.0		35.2	163	7	4	3	1	9	1	1	1	1993
3480	SA 112	177.0	57.7	2.2	3.9	1.2	1.0	0.0		32.6	92	9	3	6	1	6	3	1	1	1993
3481	SA 113	262.4	92.5	3.0	8.0	1.0	1.3	0.8		35.2	166	7	4	7	1	7	5	1	1	1993
3482	SA 114	427.2	110.7	2.3	9.8	0.9	1.3	0.1		25.9	166	0	5	5	2	7	4	1	1	1993
3483	SA 116	272.1	89.2	4.3	11.7	1.3	1.6	1.4		32.8	111	3	5	5	1	7	3	1	1	1993
3484	SA 117	310.1	96.1	3.0	9.4	1.0	1.4	0.7		31.0	101	7	5	5	1	7	3	1	1	1993
3485	SA 119	229.6	76.4	2.2	5.0	1.0	0.9	0.2		33.3	92	7	4	3	1	5	5	1	1	1993
3486	SA 120	220.8	108.4	3.7	8.3	1.4	1.8	0.6		49.1	98	1	5	4	1	9	2	1	1	1993
3487	SA 122	350.0	99.3	1.7	6.1	0.5	0.8	0.4		28.4	225	9	5	7	1	5	5	1	1	1993
3488	SA 124	277.8	106.9	2.8	10.5	0.9	1.8	1.1		38.5	161	3	4	3	1	9	5	1	1	1993
3489	SA 125	99.7	36.2	0.4	0.4	0.0	0.2	0.2		36.3	83	0	2	5	1	7	5	1	1	1993
3490	SA 128	255.4	88.7	2.7	7.0	0.9	1.2	0.6		34.7	139	5	5	4	1	5	5	1	1	1993
3491	SA 131	476.3	128.6	2.8	13.4	0.9	1.4	0.5		27.0	166	0	5	4	1	7	3	1	1	1993
3493	SA 136	212.1	66.0	0.9	1.8	0.7	0.1	0.0		31.1	85	9	4	7	1	6	4	1	1	1993
3494	SA 137	227.8	66.9	3.0	6.8	1.3	1.5	0.2		29.4	107	9	4	5	1	6	6	1	1	1993
3495	SA 138	214.0	81.0	2.6	5.5	0.5	0.6	1.5		37.8	109	5	5	3	1	5	5	1	1	1993
3496	SA 140	325.3	109.1	3.3	10.8	0.6	0.8	1.9		33.4	146	8	4	4	1	5	6	1	1	1993
3497	SA 142	220.4	81.7	2.3	5.2	0.6	0.8	0.9		37.1	104	0	3	3	1	5	5	1	1	1993
3498	SA 144	205.1	75.1	3.1	6.3	0.6	0.8	1.6		36.6	183	0	4	4	1	6	5	1	1	1993
3499	SA 145	216.3	68.4	2.7	5.8	0.6	0.8	1.3		31.6	104	0	4	4	1	6	5	1	1	1993
3500	SA 146	198.4	79.3	3.3	6.6	0.6	0.8	2.0		40.0	163	3	5	3	1	5	4	1	1	1993
3501	SA 147	229.0	93.6	4.0	9.3	0.9	1.0	2.2		40.9	140	5	5	3	1	5	4	1	1	1993
3502	SA 148	202.5	71.9	3.5	7.1	0.7	1.1	1.8		35.5	158	9	6	3	1	6	3	1	1	1993
3503	SA 151	147.4	57.7	2.5	3.7	0.6	0.9	1.0		39.1	130	5	3	5	1	4	5	1	1	1993
3504	SA 157	237.4	75.0	1.9	4.5	0.6	0.7	0.6		31.6	227	9	4	5	1	6	4	1	1	1993
3505	SA 161	357.3	112.6	3.3	11.8	0.6	1.1	1.7		31.5	162	9	4	4	1	6	3	1	1	1993
3506	SA 170	286.1	70.4	1.7	5.0	0.8	0.7	0.2		24.6	98	7	4	4	1	7	4	1	1	1993
3507	SA 176	301.7	90.6	1.7	5.2	0.8	0.8	0.1		30.0	189	3	4	5	1	7	3	1	1	1993
3508	SA 177	261.8	72.3	1.1	2.9	0.6	0.5	0.0		27.6	101	7	5	4	1	7	3	1	1	1993
3509	SA 179	787.5	193.7	3.2	25.0	0.7	0.9	1.6		24.6	273	9	9	5	2	4	3	1	1	1993
3510	SA 186	193.0	63.9	0.7	1.4	0.4	0.1	0.2		33.1	135	9	3	5	1	6	3	1	1	1993
3512	SA 190	227.7	85.0	3.0	6.7	0.9	0.9	1.2		37.3	129	4	5	5	1	5	5	1	1	1993
3513	SA 201	310.0	89.0	7.3	22.7	1.2	1.0	5.2		32.9	119	5	3	1	3	5	1	4	1	1994

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NO	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3514	SA 204	492.0	145.0	9.6	47.4	1.5	1.1	7.0		32.4	138	5	5	1	1	7	3	4	1	1994
3515	SA 210	619.0	229.0	4.9	30.5	0.9	0.9	3.1		44.8	230	1	7	1	1	9	3	5	1	1994
3516	SA 217	712.0	300.0	3.8	27.3	1.0	0.7	2.2		39.7	227	3	7	1	1	9	1	6	1	1994
3517	SA 221	716.0	185.0	9.8	69.8	1.3	1.0	7.4		33.0	125	3	5	1	5	7	5	3	1	1994
3518	SA 227	722.0	210.0	11.4	82.5	1.5	1.1	8.9		32.5	137	5	7	1	2	7	5	4	1	1994
3519	SA 234	226.0	62.0	6.7	15.2	1.4	1.2	4.2		31.1	112	5	3	1	3	5	1	3	1	1994
3520	SA 241	713.0	204.0	7.8	55.8	1.0	1.0	5.8		33.9	139	5	5	1	3	6	1	3	1	1994
3521	SA 243	608.0	208.0	5.0	36.4	0.9	0.8	4.3		38.5	203	1	6	1	1	9	3	5	1	1994
3522	SA 247	696.0	209.0	8.4	58.3	1.0	0.7	6.7		36.8	203	5	7	1	1	5	3	4	1	1994
3523	SA 267	421.0	113.0	6.5	27.2	0.5	0.6	5.4		30.5	173	3	4	1	4	5	1	3	1	1994
3524	SA 271	717.0	252.0	7.3	52.1	0.7	0.8	5.8		36.7	230	3	8	1	5	5	4	4	1	1994
3525	SA 283	872.0	260.0	9.1	79.7	1.3	1.2	6.7		28.0	175	5	7	1	1	7	5	7	1	1994
3526	SA 285	780.0	216.0	7.6	56.9	1.5	1.2	4.9		24.1	93	5	5	1	2	7	5	4	1	1994
3527	SA 287	717.0	258.0	5.5	39.3	0.6	0.4	4.5		31.1	214	5	6	1	2	5	3	4	1	1994
3528	SA 290	617.0	188.0	6.7	41.4	1.2	0.7	4.8		30.6	91	3	5	1	5	5	6	3	1	1994
3529	SA 293	716.0	195.0	5.7	40.5	1.1	0.9	3.7		27.4	152	3	5	1	2	5	3	5	1	1994
3530	SA 295	688.0	205.0	6.1	42.0	0.9	0.6	4.6		27.6	148	3	5	1	3	5	1	7	1	1994
3531	SA 297	607.0	174.0	7.2	43.5	1.3	0.9	7.2		26.2	157	5	5	1	1	5	4	5	1	1994
3532	SA 307	557.0	233.0	4.8	26.9	1.0	0.8	3.1		33.5	208	1	7	1	1	9	3	6	1	1994
3533	SA 308	299.0	88.0	6.3	18.9	0.6	0.7	5.0		35.6	209	3	5	1	1	8	1	2	1	1994
3534	SA 318	444.0	152.0	6.2	27.5	1.1	0.7	4.4		43.7	231	3	5	1	1	7	3	3	1	1994
3535	SA 321	527.3	120.4							22.8	183	2	5	4	7	9	3	3	2	1995
3536	SA 325	1030.4	187.8							18.6	212		3	5	5	7	4	3	1	1995
3537	SA 341	994.1	186.8							18.6	191	9	6	5	6	7	6	3	1	1995
3538	SA 349	1110.6	196.0							17.6	189	9	6	4	7	6	3	4	3	1995
3541	SA 362	892.6	171.9							19.1	177	9	2	7	6	8	6	3	7	1995
3542	SA 365	1089.3	197.7							18.2	173	9	6	3	6	6	4	4	1	1995
3543	SA 415	790.8	236.1							29.7	249	7	5	4	4	3	3	3	1	1995
3544	SA 458	802.9	130.9							16.0	153		3	6	6	5	7	6	1	1995
3545	SA 483	731.0	166.1							22.7	156	5	6	5	3	8	4	3	1	1995
3546	SA 520	744.0	222.3							30.0	228	5	7	4	5	5	4	4	2	1995
3547	SA 568	663.0	168.1							25.4	138	5	5	5	3	5	1	3	1	1995
3548	SA 569	856.3	212.5							25.0	169	5	4	5	6	6	6	3	1	1995
3549	SA 571	820.4	179.3							21.8	169	7	4	5	7	5	5	3	1	1995
3550	SA 575	606.3	152.6							24.3	216	5	6	6	5	7	6	4	1	1995
3551	SA 576	465.6	155.4							33.0	220	7	6	2	1	9	1	1	1	1995
3552	SA 581	402.9	134.4							32.7	263	7	3	4	4	6	4	3	1	1995
3553	SA 587	855.0	199.2							23.2	223	3	7	7	3	5	4	4	2	1995
3554	SA 589	707.3	214.6							31.0	262	3	6	3	4	4	4	5	5	1995
3555	SA 590	581.2	197.7							34.2	251	3	7	1	3	7	3	4	4	1995
3595	ZH 2901	376.4	112.8	8.7	32.6	1.2	1.1	6.5		30.0	132	1	5	3	2	5	3	3	1	1992
3595	ZH 2901	437.6	138.6	6.1	26.7	0.5	0.6	5.0		31.7	116	7	6	3	2	5	3	1	1	1993
3596	ZH 2902	392.7	122.0	9.1	35.8	1.2	1.1	6.9		31.1	123	1	5	3	2	5	4	3	1	1992
3596	ZH 2902	415.0	133.9	8.2	33.8	1.0	0.9	6.3		32.3	116	5	7	4	1	5	3	1	1	1993
3597	ZH 2903	293.1	93.6	7.7	22.5	1.4	1.3	5.0		31.9	112	6	5	3	2	5	3	3	1	1992

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3597	ZH 2903	389.7	125.3	7.0	27.1	0.7	0.7	5.6		32.2	92	5	6	5	1	5	3	1	1	1993
3598	ZH 2904	360.8	120.6	10.3	37.0	1.0	1.0	8.3		33.4	123	1	5	3	1	5	3	3	1	1992
3598	ZH 2904	313.1	104.8	6.5	20.5	0.7	0.8	5.1		33.5	88	7	4	5	1	5	3	1	1	1993
3599	ZH 2905	344.7	117.1	7.6	26.3	1.0	0.9	5.8		34.0	120	1	5	3	2	5	4	3	1	1992
3599	ZH 2905	315.5	105.1	7.4	23.2	0.5	0.7	6.1		33.3	105	2	5	4	1	6	3	1	1	1993
3600	ZH 2906	330.0	106.4	7.7	25.3	1.3	1.1	5.3		32.2	110	1	5	3	1	5	4	3	1	1992
3600	ZH 2906	274.9	84.0	5.0	13.7	0.5	0.8	3.6		30.6	97	5	5	5	1	6	3	1	1	1993
3601	ZH 2907	366.3	119.9	9.5	34.6	0.9	0.9	7.6		32.7	121	1	5	3	1	5	2	3	1	1992
3601	ZH 2907	303.6	95.1	5.0	15.3	0.9	1.0	3.2		31.3	104	4	4	4	1	7	3	1	1	1993
3602	ZH 2908	489.5	178.5	10.6	52.7	1.4	1.2	8.2		36.5	201	1	7	3	3	5	3	3	2	1992
3602	ZH 2908	376.1	110.7	9.7	36.4	0.8	1.0	7.9		29.4	166	3	6	6	2	7	1	1	1	1993
3603	ZH 2909	342.7	121.2	11.5	39.5	1.3	1.4	8.8		35.3	196	1	5	3	3	3	3	3	2	1992
3603	ZH 2909	629.5	196.0	9.4	59.0	0.9	1.1	7.4		31.1	213	3	4	7	1	6	2	1	1	1993
3604	ZH 2910	587.0	190.8	11.9	69.9	1.4	1.2	9.3		32.5	226	1	9	3	3	5	4	3	1	1992
3604	ZH 2910	546.0	160.2	8.6	47.0	0.6	1.1	6.9		29.2	231	3	7	6	1	6	1	1	1	1993
3605	ZH 2911	674.8	203.6	11.7	78.6	1.8	1.4	8.5		30.2	250	2	8	3	3	5	4	3	1	1992
3605	ZH 2911	615.4	176.2	9.1	56.2	0.9	1.3	7.0		28.6	228	5	5	4	1	5	2	1	1	1993
3606	ZH 2912	581.1	177.5	12.9	74.8	1.8	1.3	9.8		30.6	229	2	7	3	4	4	3	3	1	1992
3606	ZH 2912	559.7	166.4	9.3	51.9	1.1	1.5	6.7		29.7	228	5	7	7	1	6	3	1	1	1993
3607	ZH 2913	774.0	229.7	11.2	86.8	1.4	1.2	8.7		29.7	233	7	7	3	2	5	3	3	1	1992
3607	ZH 2913	438.6	122.9	7.4	32.6	0.9	1.3	5.3		28.0	214	5	6	7	1	6	2	1	1	1993
3608	ZH 2914	416.6	145.1	10.0	41.9	1.7	1.3	7.0		34.7	267	7	8	3	4	4	3	3	2	1992
3608	ZH 2914	567.1	186.1	6.5	36.6	0.5	0.9	5.0		32.8	246	9	8	3	2	5	3	1	1	1993
3609	ZH 2915	485.9	161.0	9.1	44.3	1.2	1.2	6.7		33.1	228	7	5	3	1	5	3	3	1	1992
3609	ZH 2915	341.4	110.4	6.2	21.1	0.7	1.1	4.4		32.3	187	2	5	5	1	7	3	1	1	1993
3610	ZH 2916	513.8	163.5	10.0	51.4	1.5	1.1	7.3		31.8	201	1	6	3	1	5	3	3	1	1992
3610	ZH 2916	419.2	144.4	9.1	38.1	0.8	1.3	7.0		34.5	215	1	6	4	1	5	1	1	1	1993
3611	ZH 2917	528.7	172.2	12.0	63.5	2.5	1.8	7.6		32.6	223	2	7	3	2	5	3	3	1	1992
3612	ZH 2918	519.9	170.5	11.5	59.8	1.3	1.1	9.1		32.8	203	1	7	3	1	4	1	3	1	1992
3613	ZH 2919	417.3	144.0	10.9	45.7	1.6	1.6	7.7		34.5	203	1	5	3	2	5	3	3	2	1992
3613	ZH 2919	397.6	119.9	6.1	32.3	1.0	1.5	5.7		30.2	192	5	7	5	1	7	3	1	1	1993
3614	ZH 2920	601.1	198.1	9.6	57.6	1.7	1.2	6.7		33.0	231	3	7	3	2	5	1	3	2	1992
3615	ZH 2921	483.3	160.0	12.3	59.5	1.5	1.3	9.5		33.1	217	3	6	3	3	4	2	3	3	1992
3615	ZH 2921	707.9	199.7	9.6	68.2	1.2	1.7	6.8		28.2	246	4	8	4	1	7	3	1	1	1993
3616	ZH 2922	526.5	158.4	10.1	53.2	1.2	1.0	7.9		32.0	187	2	6	3	4	4	2	3	1	1992
3616	ZH 2922	530.1	163.6	9.0	47.6	1.4	1.6	5.6		30.9	250	3	7	5	1	6	2	1	1	1993
3617	ZH 2923	407.7	131.6	11.1	45.4	1.6	1.3	8.3		32.3	224	7	6	3	4	4	3	3	3	1992
3617	ZH 2923	661.6	206.1	9.3	61.2	1.1	1.5	6.7		31.2	238	4	6	5	1	7	3	1	1	1993
3618	ZH 2924	549.1	183.3	12.1	66.6	1.5	0.9	9.7		33.4	211	3	7	3	1	5	2	3	1	1992
3618	ZH 2924	589.8	175.7	9.7	57.5	1.1	1.2	7.4		29.8	236	4	7	5	1	6	2	1	1	1993
3619	ZH 2925	391.8	135.9	9.9	38.8	0.7	0.8	8.5		34.7	221	3	7	3	1	4	2	3	2	1992
3619	ZH 2925	462.4	154.9	9.4	43.5	0.8	1.4	7.2		33.5	242	3	7	4	2	6	2	1	1	1993
3620	ZH 2926	501.4	153.9	9.3	46.7	1.9	1.5	5.9		30.7	214	3	7	3	2	4	3	3	1	1992
3620	ZH 2926	654.0	168.1	6.1	39.8	0.9	1.7	3.5		25.7	230	5	7	3	1	7	4	1	1	1993
3621	ZH 2927	473.7	152.0	10.6	50.4	1.3	0.9	8.4		32.1	215	2	6	3	2	4	3	3	2	1992

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3621	ZH 2927	529.3	169.4	9.4	49.7	0.8	1.2	7.4		32.0	251	3	8	4	2	7	3	1	1	1993
3622	ZH 2928	488.3	146.4	10.5	51.0	2.2	1.8	6.4		30.0	233	7	6	3	3	4	3	3	1	1992
3622	ZH 2928	673.3	174.5	6.4	42.8	1.0	1.3	4.0		25.9	231	5	6	5	2	7	3	1	1	1993
3623	ZH 2929	672.5	180.6	9.0	60.2	1.9	1.9	5.2		26.9	237	7	6	3	3	4	3	3	1	1992
3623	ZH 2929	556.5	133.8	6.3	35.0	1.1	1.9	3.3		24.0	190	9	5	6	1	7	2	1	1	1993
3624	ZH 2930	634.4	170.7	7.8	49.7	2.3	1.8	3.7		26.9	220	7	7	3	3	4	3	3	1	1992
3624	ZH 2930	598.0	147.3	4.0	24.0	1.2	1.7	1.2		24.6	227	9	6	4	1	7	5	1	1	1993
3625	ZH 2931	634.0	160.3	4.7	29.7	1.2	1.0	2.5		25.3	221	9	6	3	3	4	3	3	1	1992
3625	ZH 2931	465.9	102.3	2.7	12.8	0.6	1.1	1.1		22.0	159	0	5	3	1	5	5	1	1	1993
3626	ZH 2932	430.8	128.8	9.0	38.8	0.8	0.7	7.6		29.9	140	7	4	3	3	4	3	3	1	1992
3626	ZH 2932	423.9	127.7	8.1	34.3	1.4	1.6	5.1		30.1	164	5	5	6	1	6	3	1	1	1993
3627	ZH 2933	588.0	183.8	9.0	53.0	0.8	0.7	7.6		31.3	181	2	4	3	1	5	3	3	1	1992
3627	ZH 2933	184.4	64.9	6.8	12.5	1.7	2.0	3.1		35.2	174	3	4	7	2	7	3	1	1	1993
3628	ZH 2934	542.7	151.4	10.1	54.8	0.7	0.7	8.7		27.9	193	7	5	3	2	5	2	3	1	1992
3628	ZH 2934	206.1	60.4	4.7	9.8	1.3	1.5	1.9		29.0	108	9	5	3	1	5	2	1	1	1993
3629	ZH 2935	590.0	167.5	10.2	60.3	1.0	0.9	8.4		28.4	238	3	6	3	1	5	3	3	1	1992
3629	ZH 2935	482.5	135.7	6.6	32.8	1.7	2.3	2.8		28.1	183	7	5	3	1	7	3	1	1	1993
3630	ZH 2936	656.8	199.1	7.8	51.3	0.8	0.7	6.3		30.3	240	3	7	3	2	5	3	3	1	1992
3630	ZH 2936	484.5	145.2	6.2	29.9	1.0	1.7	3.5		30.0	187	7	5	5	1	6	3	1	1	1993
3631	ZH 2937	542.2	156.9	5.0	27.3	0.7	0.7	3.7		28.9	166	7	7	3	1	5	1	3	1	1992
3631	ZH 2937	263.8	77.5	4.2	11.2	0.7	1.2	2.3		29.4	116	9	5	7	1	5	3	1	1	1993
3632	ZH 2938	570.1	172.5	6.0	34.1	1.4	1.2	3.4		30.3	161	7	7	3	1	5	1	3	1	1992
3632	ZH 2938	363.7	113.8	3.7	13.6	0.8	1.2	1.8		31.3	120	9	5	5	2	6	2	1	1	1993
3633	ZH 2939	431.9	128.2	6.8	29.3	0.9	1.0	4.9		29.7	118	2	4	3	1	5	1	3	1	1992
3633	ZH 2939	306.3	96.4	3.1	9.4	0.8	0.9	1.4		31.5	93	5	5	5	1	6	3	1	1	1993
3634	ZH 2940	479.0	134.1	5.7	27.3	0.8	0.7	4.2		28.0	139	2	4	3	1	5	3	3	1	1992
3634	ZH 2940	347.3	98.5	3.5	12.2	0.9	1.2	1.4		28.4	84	7	5	5	1	5	3	1	1	1993
3635	ZH 2941	436.8	132.6	8.0	34.9	0.5	0.7	6.8		30.4	159	1	6	3	1	5	3	3	1	1992
3635	ZH 2941	328.6	96.8	3.3	10.9	1.0	1.3	1.0		29.5	115	5	5	3	1	5	3	1	1	1993
3636	TESA	587.0	159.0							34.1	239	1	9	1	1	7	5	7	1	1994
3637	LIPA	190.0	52.0							34.4	107	1	5	1	1	9	1	7	1	1994
3639	LISETA	236.0	87.0							43.8	94	1	6	1	1	9	1	6	1	1994
3640	H 043	1456.0	367.0	4.6	67.6	0.9	0.7	3.0		53.4	379	9	9	1	5	4	2	1	1	1994
3640	H 043	587.8	124.2							21.1	255	7	4	3	3	3	3	7	1	1995
3641	H 129	1250.0	351.0	3.8	47.6	0.5	0.7	2.3		44.7	358	9	9	1	6	5	2	1	1	1994
3642	H 130	1311.0	340.0	4.2	54.7	1.2	0.9	2.1		46.1	376	9	9	1	7	5	3	2	3	1994
3643	H 200	1461.0	348.0	4.6	66.9	1.1	0.9	2.6		36.0	371	9	9	1	4	5	3	5	4	1994
3643	H 200	763.2	153.0							19.8	232	9	5	3	5	5	3	7	1	1995
3644	H 201	1289.0	386.0	6.8	88.2	1.5	1.1	4.3		45.6	363	7	9	1	6	5	1	5	4	1994
3644	H 201	515.0	87.6							17.0	226	3	6	3	5	3	1	5	1	1995
3645	H 252	1089.0	290.0	5.1	55.9	0.9	0.8	3.5		44.9	333	9	9	1	3	4	1	1	2	1994
3646	H 266	1117.0	345.0	4.5	50.5	0.9	1.0	2.6		39.0	367	5	9	1	3	5	3	5	2	1994
3647	H 269	1295.0	335.0	4.1	53.4	0.9	0.8	2.4		46.6	370	9	9	1	3	5	4	6	2	1994
3648	SORGHAL	329.0	92.0	9.2	30.2	1.1	0.6	7.4		52.6	235	3	5	1	1	9	1	3	1	1994
3649	H 341	512.7	111.9							21.8	262	1	6	5	3	1	3	7	1	1995

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ID	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3650	EP 267	496.0	114.7							23.1	270	5	6	3	3	3	5	7	1	1995
3651	BS 02	855.9	130.7							15.3	156	9	5	5	3	3	4	4	1	1995
3651	BS 02	839.2	164.4							19.8	258	7	7	1	3	3	3	5	1	1995
3652	BS 01	768.2	128.1							16.6	201	9	4	5	3	5	4	5	1	1995
3652	BS 01	749.8	151.2							20.0	247	3	5	3	3	1	3	5	5	1995
3653	BS 09	748.2	151.8							20.3	258	7	6	1	3	1	3	7	1	1995
3654	BS 04	516.0	111.7							21.7	254	7	5	1	3	1	3	3	1	1995
3655	H 234	531.1	92.5							17.6	243	3	5	3	3	1	1	7	7	1995
3661	H 029	768.9	193.1	1.4	10.4	0.8	0.6	0.0		25.1	245	0	7	5	1	5	3	1	1	1993
3662	H 030	116.0	286.0	4.6	53.8	1.0	0.9	2.7		26.9	359	9	9	1	3	4	2	1	1	1994
3662	H 030	537.7	112.9							21.0	255	7	4	1	3	3	3	7	1	1995
3663	H 035	728.7	162.2	1.5	11.1	0.7	0.2	0.6		22.3	270	9	7	3	1	5	3	1	1	1993
3663	H 035	1133.0	335.0	5.5	61.9	1.1	1.0	3.3		30.5	394	7	9	1	3	5	1	1	1	1994
3663	H 035	1189.0	260.3							21.9	250	7	4	3	3	3	3	3	7	1995

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