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F E. Ryan
Department of Agriculture

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MAIZE GRAIN TRIAL

Denmark Research Station

By F. E. RYAN, B.Sc. Agric., (Hons.), Agrostologist

RAINFALL in the South-West of this State is of winter incidence and as such would not be considered suitable for maize production for grain, but in the lower South some occasional summer rains occur and here maize for grain is successful in selected areas. In addition there are numerous swamp areas which are flooded during the winter months but provide suitable growing conditions with adequate moisture supplies during the summer months.

Maize has been grown for green fodder by dairy farmers for a number of years and occasionally has been used in small areas for grain production.

Tests have been conducted for several years on the Denmark Research Station to determine the comparative yields of maize varieties for grain and especially the newer hybrid varieties which are now commercially available from New South Wales and Queensland. Yields from maize varieties in these trials have been found to vary

greatly from year to year according to the amount of summer rainfall received and also to the moisture supplies available from the soil. In 1950-51 the summer rainfall season was good and extremely high yields ranging from the equivalent of 90 to 194 bushels to the acre were obtained in small row trials. The mean yield of a number of varieties in that year was equivalent to 148 bushels to the acre. The general level of yields throughout the years has been much lower than this with means



Fig. 1.—General view of the experimental maize plots at Denmark Research Station.

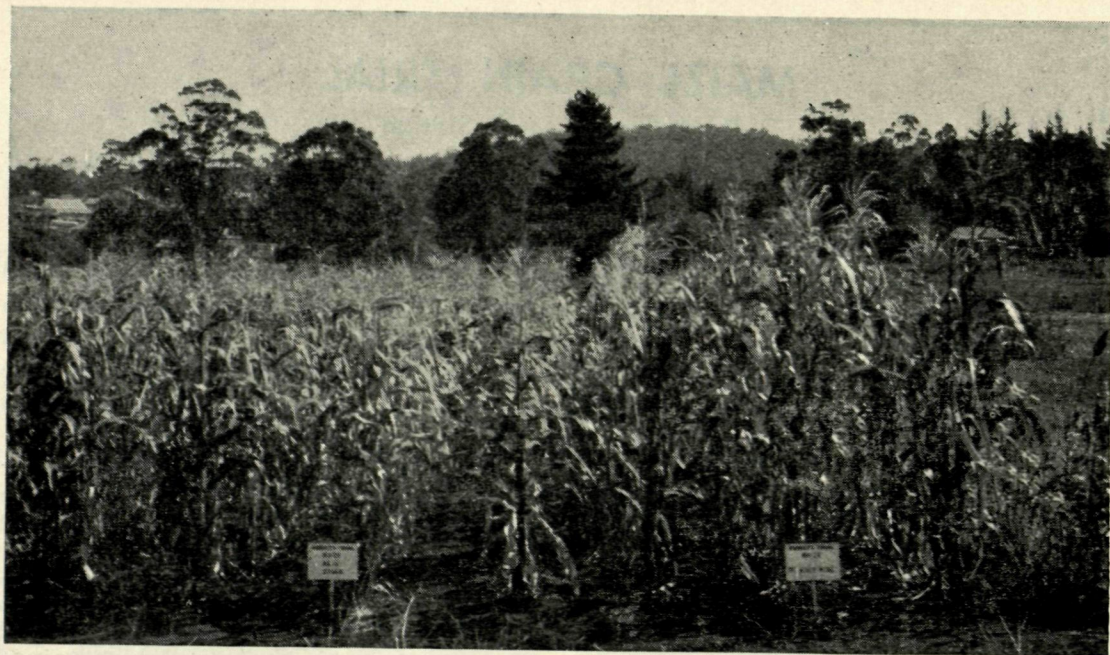


Fig. 2.—Dawn (NEH6) variety on left with the standard variety Hickory King on right.

of 47.6, 53.2, and 59.6 bushels to the acre for the years 1951/52, 1952/53, and 1953/54 respectively.

The following is an account of the results obtained in a trial during the 1953/54 season when six hybrid maize varieties were tested for grain production for comparison with the open pollinated variety Hickory King.

SITE

The trial was located on Paddock 6 of Denmark Research Station. The soil is a sandy loam soil described by Hosking and Burvill* as Type F sandy loam. It is adjacent to the river at Denmark and retains its moisture fairly well during the summer months. This area had been down to pasture for a number of years prior to the experiment.

DESIGN

Seven varieties were replicated five times in a randomised block layout. Maize was sown in rows five links apart and each plot consisted of one centre row and two buffer rows of one variety. Plots were each 30 links long.

* J. S. Hosking and G. H. Burvill—A Soil Survey of Part of the Denmark Estate. Western Australia. C.S.I.R.O. Bull. No. 115.

PREPARATION, SOWING, ETC.

The land was cultivated in the spring of 1953, allowed a short fallow period and recultivated before being sown in rows five links apart, and 3 cwt. of potato manure "C" containing copper and zinc was applied per acre.

The varieties were sown on December 7, by hand and were thinned to the average of two links apart in the rows after they had emerged. An application of 10 per cent. D.D.T. powder was dusted on the rows for the control of black beetle, and cultivation was carried out as necessary between the rows for weed control.

SEASON

The 1953/54 season was the driest for a number of years. The accompanying table shows rainfall averages for 41 years as compared with the 1953/54 figures.

—	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Total Nov. Apr.	Total Nov. Apr.
Average for 41 years....	182	146	127	133	219	324	570	1,131	1,701
1953-54	288	90	61	41	118	367	442	965	1,407

Opening rains of 1954 season fell on the 17-3-54.

RESULTS

The height, flowering and maturity of the various varieties is shown in the table below:—

	Average Height at Flowering in ft. and ins.	Average No. Days from Sowing.	
		To Flowering.	To Grain Maturity.
DS28	ft. ins.		
Sterling Hybrid (NEH 16)	6 4	76	136
Dawn Hybrid (NEH 6)	6 6	77	136
Emblem Hybrid (NEH 7)	6 4	76	148
DS333 Hybrid	6 4	77	148
Hickory King (open pollinated standard)	6 2	77	148
Standfast Hybrid (GH96A)	6 10	76	155
	6 11	89	156

Earliest maturing varieties were found to be DS28 and Sterling (NEH16), but Dawn, Emblem and DS333 were also earlier than Hickory King, and Standfast (GH96A) was found to be of the same maturity as Hickory King. The latter is considered somewhat late for grain production for the Denmark area.

YIELDS

Yields of the various varieties listed in order of decreasing grain yield is given in the table below. It is obvious that generally

hybrid maize varieties were superior to Hickory King in grain production. The highest producing variety in this year's trial was Emblem (NEH7).

Variety.	Grain Yields.		
	Bush./acre.	Cwts./acre.	Per cent. of Control Hickory King.
Emblem Hybrid (NEH 7)	70.6	35.3	137
DS28 Hybrid	65.0	32.5	126
DS333 Hybrid	64.2	32.1	125
Dawn Hybrid (NEH 6)	63.6	31.8	123
Sterling Hybrid (NEH 16)	59.0	29.5	115
Hickory King (open pollinated)	51.6	25.8	100
Standfast Hybrid (GH96A)	42.8	21.4	83
General Mean	59.6	29.8	116
Coefficient of Variation (percentage of General Mean)	6.2
Least Significant Differences—			
At 1%	19.6	9.8	38.0
At 1%	14.6	7.3	28.3
At 5%	10.8	5.4	20.9

DISCUSSION

For grain production, Hickory King maize is considered to be somewhat late for most areas in this State as when the grain is ripening autumn rains commence, and provide conditions suitable for the development of moulds in the cobs. For this rea-



Fig. 3.—Tall-growing variety Standfast (3 rows) on left and Sterling (NEH16) on right.

son, high yielding varieties which mature earlier than Hickory King are sought. The varieties DS28 and Sterling (NEH16) were most satisfactory from this point of view, ripening in 136 days from the time of sowing to grain maturity. These were harvested on April 22 and were not affected by the autumn rains.

Dawn (NEH6), Emblem (NEH7) and also DS333 were 12 days later than the first two and were still seven days earlier than Hickory King. Standfast (GH96A) is a late maturing variety and ripens in approximately the same time as Hickory King.

Four hybrid varieties, Emblem, DS28, DS333 and Dawn were all superior to Hickory King in grain yields. The highest yielding variety in this trial being Emblem (NEH7) which produced 70 bushels per acre.

The summer of 1953/54 season was exceptionally dry and yields as high as 70

bushels per acre are considered to be very good. Because of the dry season, the difference between early maturing varieties and late maturing varieties would be expected to be exaggerated and this was the case in this trial. Thus, Emblem produced over 50 per cent. greater yield in this season than Standfast (GH96A), although in past trials Standfast Hybrid has given good results.

As Emblem is an early maturing variety, it has an advantage over Standfast in that it ripens sooner and therefore avoids the autumn rains.

SUMMARY

The most satisfactory hybrid maize variety for grain production in this year's trial was Emblem (NEH7) which produced 70 bushels per acre. Other varieties gave good performances—DS28, DS333 and Dawn (NEH6).

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