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PJBS

ISSN 1028-8880

**Pakistan
Journal of Biological Sciences**

ANSI*net*

Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Studies on the Comparative Yield Potential of Five Soybean (*Glycine max* L.) Cultivars

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Abstract

The results showed that all cultivars (Ford, Ertou No.2, FS-85, Hong Kong and Williams) varied significantly in yield components. The cultivar FS-85 gave significantly higher seed yield (1851.65 kg ha⁻¹) than other cultivars due to higher number of pods plant⁻¹, number of seeds pod⁻¹ and seed weight and appeared to be the best under Faisalabad conditions.

Introduction

Soybean is one of the most important protein and oilseed crop of the world. In Pakistan, its average yield is far below than the production potential of its existing cultivars. Soybean cultivars differ in productiveness, even those grown in the same locality. Moseley and Iraneta (1986) compared the agronomic and morphological traits of cultivar 7138 with Jupiter and Improved Pelican and obtained 39 and 58 percent higher seed yield over them, respectively. Boquet *et al.* (1987) planted 75 soybean cultivars on clay soil and obtained the seed yield ranged between 28 and 47 bu/ac for cultivars B2J and Asgrow 6785, respectively. They also grew the same varieties on silt loam soil and obtained the seed yields ranged from 40 bu/ac in cv. Coker 6738 to 64 bu/ac in cv. FFR 561. Frederick *et al.* (1991) found that seed yields of modern cultivars of soybean like Williams-82 and Clark-63 were 31 and 91 percent higher than those of old cultivars, Manchu and Dunfield, respectively. Bhaskar *et al.* (1992) evaluated 16 improved varieties of soybean and obtained highest yield from cv. PK 472 (1.96 t ha⁻¹) followed by TS 79-277 (1.89 t ha⁻¹) and JS-75-46 (1.88 t ha⁻¹). Pricop (1992) reported mean annual seed yields of soybean ranging from 2.41 t in cv. F.85-2009 to 3.13 t ha⁻¹ in cv. Hodgson in an experiment on 24 soybean cultivars. Hussain (1997) conducted an experiment on five soybean cultivars and obtained the maximum seed yield for cv. FS-85 due to higher number of pods plant⁻¹ and number of seeds pod⁻¹.

After having known about the variable varietal behaviour the present study was, therefore, undertaken to compare the yield performance of five soybean cultivars with a view to determine the best adopted cultivar under irrigated conditions of Faisalabad.

Materials and Methods

Varietal performance of soybean was studied at the Agronomic Research Area, University of Agriculture, Faisalabad. Experiment was laid out in a randomized complete block design with four replications and net plot size measured 1.8 m x 6.0 m. Cultivars Ford, Ertou No. 2, FS-85, Hong Kong and Williams were included in the experiment. Crop was sown in 45 cm apart rows with the help of a single row hand drill using a seed rate of 100 kg ha⁻¹ in the first week of August 1996. A basal dose of N and P₂O₅ at 25 and 100 kg ha⁻¹ in the form of Urea and single Super Phosphate was applied, respectively. All other agronomic practices were kept uniform for all the treatments. Crop was harvested during 3rd week of November, 1996. Observations were recorded on number of plants/m², number of pods/plant, number of seeds per pod, 100-seed weight (g) and seed yield (kg ha⁻¹). The data were analysed by applying Fisher's analysis of variance technique and differences among treatments means were compared using LSD (Least Significant Difference) at 0.05 probability level (Steel and Torrie, 1984).

Results and Discussion

Plant population of various cultivars remained statistically non-significant. In case of number of pods plant⁻¹, cv. FS-85 and Williams produced significantly maximum number of pods plant i.e. 25.25 which were, however, statistically similar to that of cv. Ford. However, the minimum number of pods plant were found in cv. Ertou No. 2. Highest number of seeds per pod were produced in cv. FS-85 which was, however, statistically similar to the number of seeds pod⁻¹ for cv. Williams which in turn did not differ

Table 1: Yield and yield components of five soybean cultivars

	Number of Plants/m ²	Number of Pods/Plant	Number of Seeds/Pod	100-seed weight(g)	Seed Yield (Kg ha ⁻¹)
Ford	25.75 ^{NS}	23.25ab	2.2b	10.15a	1325.48bc
Ertou No.2	28.25	14.50c	2.2b	9.43b	1131.84c
FS-85	28.00	25.25a	2.5a	10.49a	1851.65a
Hong Kong	29.25	19.00b	2.1b	9.30b	1050.36d
Williams	24.50	25.25a	2.3ab	8.42c	1421.46b

Means followed by the same letters did not differ significantly at 5% probability level

Choudhry *et al.*: Yield performance of soybean cultivars.

significantly from rest of other cultivars (Table 1). Significant differences in the number of pods plant⁻¹ and number of seeds pod⁻¹ of soybean cultivars have also been reported by Hussain (1997).

Cultivar FS-85 produced maximum 100-seed weight of 10.49 g which was, however, statistically similar to that of cv. Ford (10.15 g). The minimum 100-seed weight was however observed in cv. Williams (8.42 g). These findings were supported by Boquet *et al.* (1987) who also observed differences in seed weights of soybean cultivars.

Maximum seed yield of 1851.65 kg ha⁻¹ was found in cv. FS-85 which differed significantly from rest of the cultivars included in the test. The differences can be attributed to the genetic make up of the plants. These findings are in conformity with those of Bhaskar *et al.* (1992) and Pricop (1992).

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