



Effect of Sowing dates and Varieties on Yield of Soybean in Coastal AP

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ABSTRACT

A field experiment was conducted during early *rabi* season of 2014-15 on clay loam soil at Agricultural College Farm, Bapatla, Andhra Pradesh, to study the “Effect of sowing dates and varieties on yield of soybean in Coastal AP. Soybean sown on 15th September was found to be the optimum sowing time for getting higher yield and ‘JS-335’ variety was promising in Coastal AP.

Key words : Soybean, Sowing dates, Varieties, Yield.

Soybean (*Glycine max L. Merrill*) is categorized as an important two in one leguminous crop with an outstanding nutritive value. It's aptly referred to as the “Golden bean” or Gold of soybean” because of its significance in Agriculture (Anoker *et al.*, 1995). It's prominence in human diet gets manifold since it contains as high as 42 per cent protein and 20 per cent oil (Bhatnagar and Tiwari, 1997). Time of sowing has a tremendous effect on soybean productivity in India because of varying agro-climatic conditions and intricate crop weather relationship. A good variety often fails to express its genetic potential if the crop is not sown at the optimum time. Soybean genotypes respond much differently to sowing dates rather than crop because flowering is closely related to photoperiod.

MATERIAL AND METHODS

A field experiment was conducted during early *rabi* season of 2014-15 at Agricultural College Farm, Bapatla, Andhra Pradesh, India. The experimental field was clay loam, slightly alkaline in soil reaction (pH 7.2) low in organic carbon (0.48%) and available nitrogen (190 kg ha⁻¹), medium in available phosphorus (22.0 kg ha⁻¹) and high in available potassium (290.5 kg ha⁻¹). Split-plot design was adopted and treatments included four dates of sowing (15th September, 15th October, 15th November and 15th December) as main plots and 3 varieties (JS-335, JS-93-05, Local) in sub plots replicated thrice. Local variety of soybean was purchased from the local market. NPK @ 30:60:40 kg ha⁻¹ was applied as basal and crop was

sown at a spacing of 45x5 cm as per the treatments. A rainfall of 387.3 mm was received in 15 rainy days during the crop growth period. The weekly mean maximum and mean minimum temperatures ranged from 25.5°C to 36.8°C and 15.2°C to 25.7°C, respectively, with an average maximum and minimum temperatures of 31.1°C and 19.9 °C, respectively. The weekly mean relative humidity ranged from 67.8 to 85.6 percent with an average of 77.0 percent.

RESULTS AND DISCUSSION

Effect of sowing dates

There was significant influence of sowing dates on days to maturity, number of pods plant⁻¹, test weight, seed yield and haulm yield.

Early sowing of soybean on September 15th took maximum number of days to reach maturity (87.6 days) which was significantly superior to 15th October and 15th November sowing but was on a par with 15th December sowing (Table-1). Similar result was also reported by Pramila Rani and Kodandaramaiah (1999).

The highest number of pods plant⁻¹ (28.7) was recorded with 15th September sowing of soybean which was significantly superior to all the other dates of sowing (Table-1). Increased number of pods plant⁻¹ with early sowings was reported by Kushwaha (1990). The maximum 1000 seed weight of soybean (112.3 g) was recorded with 15th September sowing which was significantly superior to other dates of sowing (Table-1). Early sowing of soybean on September 15th recorded highest seed

yield of 1269 kg ha⁻¹ which was significantly superior to other dates of sowing. However, the seed yield of soybean recorded was on a par with October 15th and December 15th sowing dates (Table-2). The present results are in accordance with those of Babalad *et al* (1996). Early sowing of soybean on September 15th recorded maximum haulm yield of 1978 kg ha⁻¹ which was on a par with December 15th sowing and significantly superior to other two dates of sowing. Haulm yield obtained when sown on October 15th and December 15th was on a par between them (Table-2). Similar findings of variation in haulm yield due to dates of sowing were reported by Amarajyothi and Pulla Rao (2002).

Effect of Varieties

There was significant influence of varieties on days to maturity, number of pods plant⁻¹, test weight, seed yield and haulm yield.

The maximum number of days was taken by JS-335 (88.5 days), which was significantly superior to JS-93-05 (82.4 days) and Local (75.9 days) respectively (Table-1). The maximum number of pods plant⁻¹ (25.4) was recorded with JS-335 which was significantly superior to the other two varieties JS-93-05 (17.7) and local (14.7) (Table-1). Test weight recorded was maximum with JS-93-

05 (106.7 g) which was on a par with Local variety (104.3g). (Table-1).

Highest seed yield of soybean 1109 kg ha⁻¹ was recorded with JS-335 which was on a par with variety JS-93-05 recording 1016 kg ha⁻¹ (Table-2). Highest soybean seed yield with early sowing on September 15th is due to more favorable vegetative growth period resulting in more drymatter accumulation and also effective translocation of photosynthates from source to sink during the reproductive phase. These results are in conformity with the findings Babalad *et al* (1996). The maximum haulm yield was recorded with JS-335 which was on a par with JS-93-05. Lowest haulm yield was recorded with the local soybean (Table-2). These results are in conformity with the findings of Barik and Sahoo (1989).

Interaction effect:

Interaction between sowing dates and varieties was significant for number of pod plant⁻¹, test weight and seed yield. The highest test weight of 118.5 g was recorded with JS-335 variety sown on 15th September which was on a par with JS-93-05 with test weight of 111.6 g at same sowing date and significantly superior to the other sowing dates and variety (Table-1).

Table 1. Effect of sowing dates and varieties on days to maturity, number of pods plant⁻¹ and test weight (1000-Seed weight in g) parameters of soybean.

Sowing dates	Varieties											
	Days to maturity				Number of pods plant ⁻¹				Test weight (1000-Seed weight in g)			
	JS-93-05	JS-335	Local	Mean	JS-93-05	JS-335	Local	Mean	JS-93-05	JS-335	Local	Mean
15 th September	85.7	96.7	80.3	87.6	26.2	35.0	25.0	28.7	111.6	118.5	106.9	112.3
15 th October	81.7	86.0	73.3	80.3	19.1	28.1	15.3	20.8	106.3	86.7	102.8	98.6
15 th November	76.0	80.0	71.7	75.9	11.4	18.9	10.7	13.7	102.2	79.1	101.7	94.3
15 th December	86.3	92.7	78.3	85.8	20.0	19.5	12.3	17.3	106.6	86.9	105.8	99.8
Mean	82.4	88.8	75.9		19.2	25.4	15.8		106.7	92.8	104.3	
CD (P=0.05)												
	Days to maturity				Number of pods plant ⁻¹				Test weight			
Sowing dates	4.9				1.5				5.2			
Varieties	2.4				1.1				4.6			
Varieties at same date	NS				2.0				9.0			
Dates at the same or different varieties	NS				0.6				2.8			

Table 2. Effect of sowing dates and varieties on number of pods plant⁻¹, seed yield (kg ha⁻¹) and haulm yield (kg ha⁻¹) of soybean.

Sowing dates	Varieties							
	Seed yield (kg ha ⁻¹)				Haulm yield (kg ha ⁻¹)			
	JS-93-05	JS-335	Local	Mean	JS-93-05	JS-335	Local	Mean
15 th September	1284	1523	1001	1269	1973	2009	1951	1978
15 th October	834	1074	889	932	1767	1925	1660	1784
15 th November	935	881	848	888	1617	1733	1389	1580
15 th December	1011	959	911	960	1937	1854	1684	1825
Mean	1016	1109	912		1824	1880	1671	

CD (P=0.05)		
Sowing dates	Seed yield (kg ha ⁻¹)	Haulm yield (kg ha ⁻¹)
Varieties	105	121
Varieties at same date	204	NS
Dates at the same or different varieties	66	NS

Early sowing of soybean on 15th September with variety JS-335 recorded significantly highest number of pods plant⁻¹ compared to JS-93-05 and Local varieties of soybean (Table-2). Early sowing of soybean on 15th September with variety JS-335 recorded significantly higher seed yield compared to JS-93-05 and Local varieties of soybean at different dates of sowing (Table-2).

It can be concluded that soybean sown on September 15th is more conducive with variety JS-335 in coastal Andhra Pradesh.

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