

Effect of conjoint use of manures and fertilizers on yield and quality of soybean grains

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ABSTRACT

A field experiment was conducted to study the effect of use of manures and fertilizers alone and in combination on yield and quality of soybean. Application of chemical fertilizers (50:145:43 kg ha⁻¹ NPK) on STCRC basis recorded the highest grain and straw yield. The physical quality parameters of grain like grain appearance score (out of 10), Seed index value and hectoliter weight was observed maximum under conjoint use of manures and fertilizers. The highest crude protein (42.97%) content was also recorded under conjoint use of manures and fertilizers. Starch content in soybean grain remains unaffected in different treatments. The methionine content in grain ranged from 1.28 to 1.45 g/16 g N. Per cent oil content was maximum (20.84%) under application of 33 t FYM + 8 t Neem cake.

Key words : Manures, Fertilizers, Yield, Quality, Soybean.

Soybean (*Glycine max.* (L.) Merrill) is an important pulse as well as oil seed crop. Soybean contains 40 to 42 per cent protein and 20 per cent oil. It has got worldwide acceptance because of the proteinous nature and termed as "Golden bean" by the agricultural scientist (Xavier Paul Raj, 2002). Although all quality characteristic of soybean are genetically controlled, it had long been known that the cultivation environment is also important as a modifier. Among the factors of quality crop production on sustainable basis, soils, fertilizers and moisture are main factors, which alter grain quality and yield also. Hence present experiment was planned to study generate scientific information on the effect of manures and fertilizers application alone and in combination on yield and quality of soybean grains.

MATERIALS AND METHODS

A field experiment was conducted at STCRC farm of Mahatma Phule Krishi Vidyapeeth Rahuri, during *kharif* season of 2005-06 using soybean (cv. JS-335) as a test crop. The experiment was conducted in RBD and comprising three replications and eight treatments. The experimental soil was alkaline (pH 8.62) with low salt content (EC 0.20 dsm⁻¹) and available N (165.20 Kg ha⁻¹), phosphorus (16.95 Kg ha⁻¹) and potassium (392 Kg ha⁻¹) were low, medium and high, respectively. The soybean grains were analyzed for quality parameters like grain appearance score (Supekar *et al.*, 2005), thousand-

grain weight of seed (A.A.C.C., 1976) and hectoliter weight (Mishra *et al.*, 1998). For grain appearance score, score out of 10 was recorded on the basis of colour, lusture and boldness of grain. The weight of 250 grains was recorded and multiplied by four and mean values were reported as seed index. The observation on hectoliter weight of soybean grains were recorded by using hectoliter instrument developed by quality group scientists of Directorate of Wheat Research (ICAR) and average weight was reported as kg hl⁻¹. Crude protein content in soybean grain was determined by Microkjeldhal's method (A.O.A.C., 1990). Starch content was determined by method of McCreddy *et al.* (1950), while methionine content in grain was estimated by a method described by McCarty and Paille (1959). The crude oil content was determined by the ether extraction using soxhlet apparatus (A.O.A.C., 1990).

RESULTS AND DISCUSSION

Grain and straw yield:

It was observed that grain yield increased significantly by the manures and fertilizers application over control (Table 1). Grain yield varied from 13.11 q ha⁻¹ (control) to 24.48 q ha⁻¹ (STCRC target). The highest grain yield of soybean was obtained under STCRC target treatment fallowed by combination of organic and chemical fertilizer and general recommended dose. Similar observations were recorded with respect to straw yield. The highest grain and straw yield under GRD and STCRC target treatment might be attributed to higher supply of