SEED PRODUCTION IN VEGETABLE COWPEA [VIGNA UNGUICULATA (L.) WALP] UNDER INTEGRATED NUTRIENT MANAGEMENT

Meera V. Menon, D. Bhaskar Reddy, P. Prameela and Jayasree Krishnankutty
Department of Agronomy, College of Horticulture, Kerala Agricultural University, Thissur - 680 656, India

ABSTRACT
A study was taken up to evaluate the effect of different organic and inorganic nutrient sources, their combinations and schedules on seed production and quality of vegetable cowpea (Vigna unguiculata(L.) Walp.). Plant height and dry matter production were highest in the treatment where poultry manure supplying N equivalent to 10 tonnes cow dung per hectare was applied in 2 splits (as basal and 1 month after sowing), along with inorganic fertilizers at 20:30:10 kg N, P and K per hectare. This treatment was at par with the similar treatment where poultry manure was applied entirely as basal. Seed yield and 100 seed weight were also highest in this treatment. Combination of organic and inorganic nutrient sources gave significantly better results than when either was used alone with regard to the growth of plants. Significant positive response to top dressing of poultry manure was observed even at half the recommended dose, although it is usually recommended to apply organic manures at the time of planting.

Key words : Cowpea Vegetable, Seed production, Nutrient management .

INTRODUCTION
Cowpea (Vigna unguiculata(L.) Walp.) is one of the important kharif pulses grown in India. It is a warm season crop, well adapted to many areas of the humid tropics and sub tropical zones. It is grown throughout India for its long, green vegetable pods, seeds and foliage for fodder. In India, cowpea is grown on about 0.5 million ha with an average productivity of 600 to 750 kg grains/ha.

Seed production is an area of interest in vegetable cowpea, as availability of quality seed is a felt need among vegetable growers. The interactive advantage of combining possible sources of nutrients and their scientific management to the use of individual components has been proved for optimum growth, yield and quality in different crops. The superiority of organic manures like poultry manure and vermicompost in improving fruit and seed quality characters have been recorded in many vegetables like brinjal and okra. A study was taken up to evaluate the effect of different organic and inorganic nutrient sources, their combinations and schedules of application on seed production and quality of vegetable cowpea (Vigna unguiculata(L.) Walp).

MATERIAL AND METHODS
The experiment was conducted in the College of Horticulture, Vellanikkara, Thrissur in 2005-06. Sowing was done in the first week of October 2005. The soil type is laterite with a pH of 5.3 and the area experiences typical humid tropical climate. Vegetable cowpea variety ‘Bhagyalakshmi’ was used for the study. The experiment was laid out in RBD with three replications. The following treatments were imposed:
T1- RDF (Recommended dose of fertilizers, i.e., 20:30:10 kg N, P and K ha\(^{-1}\)) + 20 t cow dung.
T2- Inorganic fertilizers alone (20:30:10 kg N, P and K ha\(^{-1}\))
T3- Cow dung alone (20 t ha\(^{-1}\)) as basal.
T4- Cow dung alone (20 t ha\(^{-1}\)) in 2 splits: 50%, as basal + 50%, 30 days after sowing
T5- Poultry manure alone (supplying N equivalent to 20 t ha\(^{-1}\) cow dung) as basal dose
T6- Poultry manure alone (supplying N equivalent to 20 t ha\(^{-1}\) cow dung) in 2 splits
T7- Vermicompost alone (supplying N equivalent to 20 t ha\(^{-1}\) cow dung) as basal dose
T8- Vermicompost alone (supplying N equivalent to 20 t ha\(^{-1}\) cow dung) in 2 splits
T9- Cow dung alone (10 t ha\(^{-1}\)) as basal dose + RDF
T10- Cow dung (10 t ha\(^{-1}\)) in 2 splits + RDF
T11- Poultry manure alone (supplying N equivalent to 10 t ha\(^{-1}\) cow dung) as basal dose + RDF
T12- Poultry manure alone (supplying N equivalent to 10 t ha\(^{-1}\) cow dung) in 2 splits + RDF
T13- Vermicompost (supplying N equivalent to 10 t ha\(^{-1}\) cow dung) as basal dose + RDF
T14- Vermicompost (supplying N equivalent to 10 t ha\(^{-1}\) cow dung) in 2 splits + RDF

* ½ N, full P and full K to be applied as basal dose and ½ N applied 20 DAS.

The data were statistically analysed using the Dunnett's multiple range test, where the values coming under the alphabet are statistically on par.

**RESULTS AND DISCUSSION**

The results presented in Table 1 revealed that plant height and dry matter production were highest in the treatment where poultry manure supplying N equivalent to 10 tonnes cow dung per hectare was applied in 2 splits (as basal dose and one month after sowing), along with inorganic fertilizers at 20:30:10 kg N, P and K per hectare (T12). This treatment was at par with the similar treatment where poultry manure was applied entirely as basal dose (T11). Seed yield and 100 seed weight were also highest in this treatment. Total seed protein content in T12 was at par with T1, the treatment which received the recommended dose of fertilizers (RDF), which recorded the highest value.

With regard to the growth of plants, i.e., the plant height and number of branches per plant, integrated management of organic and inorganic source combinations gave significantly better results. This is in tune with results obtained in vegetable pea by Datt et al. (2003). Dry matter production was highest in the combinations of inorganic fertilizers with half the recommended dose of poultry manure and also in the RDF treatment. The superiority of poultry manure even at the N equivalent of 10 tonnes cow dung was brought out in promoting vegetative growth and dry matter accumulation. Highest seed yield and seed weight were also in this treatment. Similar results have been reported in common bean (Solinon et al., 1991). Complementary application of inorganic and organic fertilizers has been reported to result in best performance of maize and cowpea (Ayoola and Makinde, 2007). A combination of NPK-fertilizers and organic manure (FYM) had greater net energy output and non-renewable energy productivity in soybean production than with NPK and control (no fertilizer) (Mandal et al., 2009). Ganeshamurthy and Reddy (2010) have reported that dry matter production and seed yield of soybean were increased significantly by the application of both farmyard manure and sulphur.

In this study, significant positive response to top dressing of poultry manure was observed even at half the recommended dose, although it is usually recommended to apply organic manures at the time of planting. The merit of poultry manure in achieving higher seed yield and quality in cowpea is attributed to several desirable changes and ameliorant effects brought about in the soil. Application of increasing poultry manure rates have been reported to increase the soil pH and soil concentrations of Ca, K, Mg, Mn, N, P and Zn.
These results call for a detailed investigation on the effects of different organic manures on soil properties and a fresh look at the schedule of organic manure application in crops.

**REFERENCES**