

## Effect of FYM and inorganic fertilizer on growth and yield and *Rabi* grain amaranth (*Amaranthus hypochondriacus* L.)

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### ABSTRACT

A field experiment was conducted during *Rabi* season of 2007-08 at College Farm, Navsari Agricultural University, Navsari to study Effect of farmyard manure and inorganic fertilizers on growth and yield of *Rabi* grain amaranth (*Amaranthus hypochondriacus* L.). The results revealed that seed yield, growth and yield attributes were significantly increased by the application of FYM @ 10 t ha<sup>-1</sup>. Significantly the highest plant height (127.83 cm), number of leaves per plant (29.82) stem girth (3.65 cm), dry matter accumulation (82.51 g), number of spikelet per spike (52.89) and seed yield (1516.67 kg ha<sup>-1</sup>) was recorded with the application of FYM @ 10 t ha<sup>-1</sup> over control. The per cent increase in yield by the application of FYM @ 10 t ha<sup>-1</sup> was to tune of 10.00 and 68.51 per cent over FYM @ 5 t ha<sup>-1</sup> and control treatment, respectively. The maximum plant height (134.31 cm) and number of leaves per plant were recorded significantly under the application of 100 per cent RDF whereas it was lowest under the control treatment. Treatment receiving 100 per cent RDF produced significantly highest stem girth (3.93 cm) and dry matter accumulation per plant being at par with 75 per cent RDF. Significantly higher numbers of lateral spikelets per spike were recorded in 100 per cent RDF (F<sub>2</sub>) treatment being at par with 75 per cent RDF. Application of 100 per cent RDF produced significantly the highest seed yield (1612.00 kg ha<sup>-1</sup>). This was 12.46 per cent higher over 75 per cent recommended dose of fertilizer.

**Key words :** Grain amaranth, FYM and inorganic fertilizers

### INTRODUCTION

Grain amaranth (*Amaranthus hypochondriacus* L.) is a neglected psuedocereal crop belongs to family *Amaranthaceae*. In India, amaranth is commonly grown in Himachal Pradesh, Madhya Pradesh, Maharashtra and part of Gujarat. Amaranth is quick growing multipurpose crop with good potential for grain, vegetable and fodder. Among various agronomic factors known to augment crop yield, fertilizer management plays a vital role in increasing crop productivity, as the crop responds better to fertilizer application. Fertilizer is costly but important input of crop production. The use of farmyard manure along with inorganic fertilizer enhance productivity and improves the physico-chemical properties of soil. The increasing cost of fertilizers play a significant role in increasing cost of production of agricultural produce and there by reduction in the profit. Further, substitution of chemical fertilizers with organic manures, which is eco-friendly and the way out for saving of fertilizer. Organic manures are a good source of nutrients and contribute towards built up of organic matter in soil. Hence, balanced fertilizer use along with organic manure like FYM is considered as promising agro-technique to sustain yield and restore soil fertility.

### MATERIALS AND METHODS

The field experiment was conducted at the College Farm, N.M. College of Agriculture, Navsari Agricultural University, Navsari, during *Rabi* season of 2007-08. The soil of the experiment field was clayey in texture, low in

available nitrogen (176 kg ha<sup>-1</sup>), medium in available phosphorus (32 kg ha<sup>-1</sup>) and fairly rich in available potassium (350 kg ha<sup>-1</sup>) with 7.8 pH. Nine treatment combinations consisting of three levels of farmyard manure viz., control (M<sub>0</sub>), FYM @ 5 t ha<sup>-1</sup> (M<sub>1</sub>) and FYM @ 10 t ha<sup>-1</sup> (M<sub>2</sub>) and three levels of inorganic fertilizer namely control (F<sub>0</sub>), 75 per cent recommended dose of fertilizer (F<sub>1</sub>) and 100 per cent recommended dose of fertilizer (F<sub>2</sub>) were tried in a factorial randomized block design with four replications. The recommended fertilizer dose, i.e. 40:40:00 kg ha<sup>-1</sup> applied through inorganic fertilizer. The grain amaranth cv. GA-2 was sown on 5th November 2007 keeping 30 cm inter-row spacing and intra-row spacing of 10 cm was maintained by thinning operation. Recommended cultural practices were also adopted as per need of crop.

### RESULTS AND DISCUSSION

The results obtained from the present study as well as relevant discussion have been summarized under following heads:

#### Growth attributes:

Application of FYM was found to have significant effect on most of the growth parameters. The mean plant height, number of leaves per plant, stem girth and dry matter accumulation recorded at various growth stages (Table 1) were significantly higher with the application of FYM @ 10 t ha<sup>-1</sup> and remained statistically at par with

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