

## Effect of organic and inorganic nutrient sources on growth and yield components of Palak (*Beta vulgaris* var. *bengalensis* Hort.)

K. PADMANABHA, M.R. UMESH\*, K.S. KRISHNAPPA AND M.H. MANJUNATHA  
University of Agricultural Sciences, BANGALORE (KARNATAKA) INDIA

### ABSTRACT

A field experiment was conducted at horticulture research farm, University of Agricultural Sciences, Bangalore during *rabi* season of 2002. The research results revealed that application of  $N_{150}P_{100}K_{100}$  + Agrimagic equivalent to FYM on N basis gave significantly higher plant height, number of leaves, leaf area per plant, leaf area index and total chlorophyll content of leaf. It also recorded higher total dry matter production per plant (2.36), green leaf yield in main crop (157.2 q/ha), ratoon- I (143.8 q/ha) and ratoon (131.5 q/ha).

**Key words :** Palak, Nitrogen, Phosphorus, Potash, FYM, Agrimagic, Ratoon

### INTRODUCTION

Palak or spinach bean is rich in fat (0.8g), calcium (380 mg) and iron (62 mg) it also contains higher fibrous matter which provides necessary roughage in the diet that stimulate intestinal action and prevents constipation. It is highly popular vegetable due to relatively easy cultivation and short duration. Nutritionists recommend that the per capita consumption of leafy vegetables should be at least 110 g per day. It is grown in energy starving areas with minimum external sources of nutrients exploiting much lower than its potential yield. Nutrition through organic or inorganic means is a holistic system approach focusing on the system rather than an individual crop. Required productivity and sustainability can be achieved by supplying both organic and inorganic fertilizers. It also ensures synchrony in nutrient demand by the crop and nutrient release. Nutrient efficiency can be enhanced by right quantity with right proportion, time and method. The sustainable yield of palak can be achieved through integrated nutrient management practices. The present investigation focused on improving the growth and yield of palak through organic and inorganic nutrient sources.

### MATERIALS AND METHODS

A field experiment was conducted at the Horticultural Research Farm, University of Agricultural Sciences, GKVK, Bangalore during *rabi* season under irrigated condition to study the "Nutrition of palak (*Beta vulgaris* var. *bengalensis* Hort.) through organic and inorganic nutrient sources". The study area is situated at 12° 58' north latitude and 77° 35' East longitudes with an altitude of 930 m above mean sea level. The Palak variety All Green released by IARI, New Delhi was used. It is suitable for multicutting (6-7) with a genetic potential of 125 q ha<sup>-1</sup>.

The experiment was laid out in Randomized Complete Block Design (RCBD) with sixteen treatments having three replications. Three treatment consists of T<sub>1</sub>-Control, T<sub>2</sub>-  $N_{150}P_{100}K_{100}$  + FYM<sub>20</sub>, T<sub>3</sub>- $N_{75}P_{50}K_{50}$  + FYM<sub>10</sub>, T<sub>4</sub>-  $N_{112.5}P_{75}K_{75}$  + FYM<sub>15</sub>, T<sub>5</sub>- $N_{150}P_{100}K_{100}$  + Agrimagic 280 kg/ha, T<sub>6</sub>- $N_{112.5}P_{75}K_{75}$  + FYM<sub>15</sub> + Agrimagic 280 kg/ha, T<sub>7</sub>-  $N_{112.5}P_{75}K_{75}$  + FYM<sub>15</sub> + Agrimagic 560 kg/ha, T<sub>8</sub>-  $N_{75}P_{50}K_{50}$  + FYM<sub>10</sub> + Agrimagic 280 kg/ha, T<sub>9</sub>-  $N_{75}P_{50}K_{50}$  + FYM<sub>10</sub> + Agrimagic 560 kg/ha, T<sub>10</sub>- Agrimagic 560 kg/ha, T<sub>11</sub>-  $N_{150}P_{100}K_{100}$ , T<sub>12</sub>-  $N_{150}P_{100}K_{100}$  + Agrimagic equivalent to FYM on N basis, T<sub>13</sub>-  $N_{150}P_{100}K_{100}$  + 27 kg of fulvic liquid + seed line granular + two post plant spray, T<sub>14</sub>-  $N_{112.5}P_{75}K_{75}$  + 27 kg of fulvic liquid + seed line granular + two post plant spray, T<sub>15</sub>-  $N_{112.5}P_{75}K_{75}$  + 36 kg of fulvic liquid + seed line granular + two post plant spray and T<sub>16</sub>-  $N_{75}P_{50}K_{50}$  + 36 kg of fulvic liquid + seed line granular + two post plant spray.

The soils were sandy loam with low in available soil nitrogen (156 kg ha<sup>-1</sup>), phosphorus (16.54 kg ha<sup>-1</sup>) and potassium (136.62 kg ha<sup>-1</sup>) with normal pH (6.7). The nitrogen was applied in three equal splits while P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were applied as basal at the time of sowing. Composites of surface soil samples to a depth of 31.5 cm were collected at before sowing and after harvest of the crop.

The nutrient composition of Agrimagic was 1.119, 0.007 and 0.152 per cent NPK and applied as per the treatment combination. Fulvic liquid and seed line granular (110 kg ha<sup>-1</sup>) was applied according to treatment combination for seed line granular agrimagic placed in a row before sowing. Fulvic acid liquid was extracted from agrimagic by soaking two kg of agrimagic in five liters of water for a period of 36 hours diluted the same according to requirement used for both soil and foliar spray at 20 DAS and 30 DAS.