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Performance of leafy vegetables under protected environment and open field condition

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ABSTRACT

Greenhouse are the framed or inflated structures covered with transparent or translucent material large enough to grow crops under partial or fully controlled environmental conditions to get optimum growth and productivity. Greenhouse crops yield several times more than the yields obtained from outdoor cultivation depending upon the cropping system and the degree of environmental control. Because of environmental control, any crop can be grown at any time of the year and even one type of crop can be raised round the year if needed. An experiment was conducted on leafy vegetables (Spinach, amaranths, fenugreek and coriander) at Horticultural Research Farm, Indira Gandhi Agricultural University, Raipur (C.G.), to see the performance of leafy vegetables under protected environment and in open field condition. As greenhouse cultivation is capital intensive, heavy financial investments are necessary especially in the initial years to construct and equip with adequate environmental control devices. The initial heavy financial investment must be compensated by additional crop yield and export oriented crops. The germination percentage was found 10-20% more under greenhouse condition as compared to open field. Greenhouse culture leads to 2-3 times more yield than that of outdoor cultivation. The yield was found higher under protected environment (6.94, 6.62, 8.63 and 2.34 kg spinach, amaranthus, fenugreek and coriander respectively) as compare to open field condition (3.15, 3.00, 4.95 and 1.68 kg,-spinach, amaranthus, fenugreek and coriander respectively). Similarly the observations on height of plant, number of leaves, number of branches, length of leaves, width of leaves and weight of leaves per plot were taken in order to know the effect of greenhouse environment on the growth of the plants. The study revealed that the greenhouse cultivation showed superior yield and yield attributing characters as compared to open field condition.

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World population is expected to increase by about 40% till 2020 to a total population of 8 billion. More than 80% of this population will live in what is today called the developing world, which is already most food insecure. An estimated 2 billion people suffers from lack of vitamins and essential minerals. The women and children living in developing countries are the worst affected ones. Hence the vegetables are the best available option for the global nutritional security in future. The green leafy vegetables like spinach, amaranthus, fenugreek and coriader etc. are rich source of calcium, iron and b-carbonate as well as vitamin C. riboflavion and folic acid. It is advisable to include at least 50 g of green leafy vegetables daily in one's diet (Singh and Kalloo, 2000).

Singh (1998) reported that India is the largest producer of vegetable crops next to china. Despite its vegetable production in the country in much less than the requirement if balanced diet is provided to every individual. The present production of 71.50 million tonnes is to be raised to 196.5 million tonnes by 2020. There are different ways and means to achieve this target, e.g. , bringing additional area under vegetable crops, using hybrid seeds, use of improved agro techniques. Another potential approach is perfection and promotion of protected cultivation of vegetables. Production of vegetable under protected conditions involves protection of production stages of vegetables mainly from adverse environmental conditions such as temperature, hail, scorching sun. heavy rains, snow. Protected conditions can be used as conventional devices to computerized environment controlled greenhouse.

Leafy vegetables are an important natural source of minerals and vitamins for mankind. They are easily available at cheaper rate in the market as compared to other vegetables. These can easily be cooked with other vegetables like potato, onion and brinjal. They are very rich sources of vitamins A and C minerals like iron, calcium and phosphorus. Appreciable quality of proteins