

## **Hi-Tech Vegetable Nursery: Key Gradient for Economic Development**

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### **I. Introduction**

An agricultural intervention and innovation continuum in all facets of agriculture and allied activities with its effective diffusion is key to sustainably increase the agricultural production and productivity with environment sustainability. The KVKs are edge in technology transfer over other service providers by virtue of their having better technical expertise and demonstration units with the intervention. The majority of the farmers have modified their agricultural patterns which were related to diversification of crops and changes in cropping pattern. Due to the interventions of KVKs there has been increase in adoption of new technologies, minimum use of fertilizers and pesticides, increase in production and income among farming community. The trainings programmes are to be designed by the KVKs to impart the latest knowledge to the farmers through work experience by applying the principles of "Learning by Doing". The prime goal of KVK is to impart knowledge as per needs and requirements of the farming community (farmers/farm-women and farm youths).

KVKs are playing a pro-active role in transferring new technologies at field level with beneficial impacts. They have an edge in technology transfer over other service provider by their virtue of having better technical expertise and demonstration units. Studies conducted recently by National Institute of Labour Economics Research and Development in the year 2015 revealed that 40% farmers implemented the technology immediately after its dissemination by KVK and 25% did so from the next agriculture season. As much as 80% of the farmers have modified their agriculture patterns which were related to diversification of crops, change in cropping pattern, seed of planting technique, uses of fertilizers and pesticides and in water use pattern. More than 50% of the farmers have mechanized their farm operations; however, ownership of farm machinery and technology adoption increased with the size of the holdings and education level of the farmers. In view of the above facts in consideration; Sardar Harbir Singh who is very innovative and progressive farmer of village Dadlu district Kurukshetra has established an excellent Hi-Tech Vegetable Nursery which is unique in India under the technical guidance, expertise and transfer of technologies by KVK experts. He has developed an eco-friendly media in his nursery with a combination of FYM + Burnt rice husk + Sand containing Silica gradients which are easily available locally without involving much cost. He has shown exemplary dedication, commitment in providing technologies environment – friendly and reducing input cost significantly.

### **IMPACT OF ADOPTION OF NEW TECHNOLOGIES**

It is no longer possible to meet the needs of increasing numbers of world population and to achieve food security objectives by expanding areas under cultivation since the fertile land is not increasing over time. But this problem can only be solved more by increasing agricultural productivity of farm households. However, achieving agricultural productivity growth will not be possible without developing and disseminating yield-increasing technologies and application of these technologies by farm households. Agricultural research and technological improvements are therefore crucial to increase agricultural productivity and thereby reduce poverty and meet demands for food without irreversible degradation of the natural resource base.

During the year 2015-16, Sardar Harbir Singh has established a nursery named, Harbir Hi-Tech Nursery Farm and produced 48 lacs of Tomatoes (cost benefit ratio 1.71), 32 lacs of Capsicum (cost benefit ratio 2.00), 52 lacs of Chillies (cost benefit ratio 1.83), 35 lacs of Cauliflower (cost benefit ratio 2.00), 682.5 lacs of Onion seedlings (cost benefit ratio 1.80) and 10 acres of Paddy nurseries on bed at his farm. Besides, nursery growing and marketing in Haryana, Uttaranchal Pradesh, Punjab, Rajasthan, U.P., Uttarakhand and even Italy as well as other destinations where his vegetable nurseries is transported. He is also maintaining 250 colonies of bees, poultry unit (benefit cost ratio 1.83) and growing all vegetables with balanced fertilizers and minimum use of pesticides to sustain soil health. In nut shell, we can say that Sardar Harbir Singh doing well in all respect for soil health, eco-friendly, socially, economically and environmentally sustained agri-enterprises

which plays an important role for sustainable economic development of the country as a whole. Some of the successful milestones achieved by Sardar Harbir Singh are explained in detailed are given in **Tables 1 to Table 10** as under:

**Table 1. Economics of Paddy-Wheat Rotation**

| Year    | Gross cost (Rs./ha) | Gross returns (Rs./ha) | Net profit (Rs./ha) | B:C ratio |
|---------|---------------------|------------------------|---------------------|-----------|
| 2011-12 | 47,500              | 1,48,875               | 1,01,375            | 3.13      |
| 2012-13 | 47,500              | 1,54,688               | 1,07,188            | 3.26      |
| 2013-14 | 47,000              | 2,17,500               | 1,70,500            | 4.63      |
| 2014-15 | 45,063              | 1,87,688               | 1,42,625            | 4.17      |
| 2015-16 | 42,750              | 1,86,375               | 1,43,625            | 4.36      |

**Table 2. Economic Analysis of Tomato Seedlings Produced in Nursery**

| Year    | Seedlings produced (No.) | Gross expenditure (Rs.) | Gross returns (Rs.) | Net profit (Rs.) | B:C ratio |
|---------|--------------------------|-------------------------|---------------------|------------------|-----------|
| 2011-12 | 27,00,000                | 8,10,000                | 13,50,000           | 5,40,000         | 1.67      |
| 2012-13 | 38,00,000                | 12,16,000               | 20,90,000           | 8,74,000         | 1.72      |
| 2013-14 | 57,00,000                | 19,38,000               | 31,35,000           | 11,97,000        | 1.62      |
| 2014-15 | 46,00,000                | 16,10,000               | 27,60,000           | 11,50,000        | 1.71      |
| 2015-16 | 48,00,000                | 16,80,000               | 28,80,000           | 12,00,000        | 1.71      |

**Table 3. Economic Analysis of Capsicum Seedlings Produced in Nursery**

| Year    | Seedlings produced (No.) | Gross expenditure (Rs.) | Gross returns (Rs.) | Net profit (Rs.) | B:C ratio |
|---------|--------------------------|-------------------------|---------------------|------------------|-----------|
| 2011-12 | 24,00,000                | 9,60,000                | 24,00,000           | 14,40,000        | 2.50      |
| 2012-13 | 30,00,000                | 12,00,000               | 22,50,000           | 10,50,000        | 1.88      |
| 2013-14 | 35,00,000                | 16,00,000               | 28,00,000           | 12,00,000        | 1.75      |
| 2014-15 | 35,00,000                | 17,50,000               | 35,00,000           | 17,50,000        | 2.00      |
| 2015-16 | 36,00,000                | 18,00,000               | 36,00,000           | 18,00,000        | 2.00      |

**Table 4. Economic Analysis of Chilies Seedlings Produced in Nursery**

| Year    | Seedlings produced (No.) | Gross expenditure (Rs.) | Gross returns (Rs.) | Net profit (Rs.) | B:C ratio |
|---------|--------------------------|-------------------------|---------------------|------------------|-----------|
| 2011-12 | 40,00,000                | 8,90,000                | 17,80,000           | 8,90,000         | 2.00      |
| 2012-13 | 44,00,000                | 10,50,000               | 22,10,000           | 11,60,000        | 2.10      |
| 2013-14 | 44,00,000                | 11,60,000               | 22,40,000           | 10,80,000        | 1.93      |
| 2014-15 | 48,00,000                | 12,00,000               | 24,00,000           | 12,00,000        | 2.00      |
| 2015-16 | 52,00,000                | 15,60,000               | 28,60,000           | 13,00,000        | 1.83      |

**Table 5. Economic Analysis of Cauliflower Seedlings Produced in Nursery**

| Year    | Seedlings produced (No.) | Gross expenditure (Rs.) | Gross returns (Rs.) | Net profit (Rs.) | B:C ratio |
|---------|--------------------------|-------------------------|---------------------|------------------|-----------|
| 2011-12 | 16,00,000                | 3,20,000                | 5,20,000            | 2,00,000         | 1.63      |
| 2012-13 | 30,00,000                | 6,00,000                | 12,00,000           | 6,00,000         | 2.00      |
| 2013-14 | 30,00,000                | 7,00,000                | 12,00,000           | 5,00,000         | 1.71      |
| 2014-15 | 32,00,000                | 7,00,000                | 12,80,000           | 5,80,000         | 1.83      |
| 2015-16 | 35,00,000                | 7,50,000                | 15,75,000           | 8,25,000         | 2.10      |

**Table 6. Economic Analysis Onion Seedlings produced in nursery**

| Year    | Seedlings produced (No.) | Gross expenditure (Rs.) | Gross returns (Rs.) | Net profit (Rs.) | B:C ratio |
|---------|--------------------------|-------------------------|---------------------|------------------|-----------|
| 2011-12 | 420,00,000               | 5,80,000                | 9,80,000            | 4,00,000         | 1.69      |
| 2012-13 | 422,50,000               | 6,00,000                | 14,75,000           | 8,75,000         | 2.46      |
| 2013-14 | 568,75,000               | 6,00,000                | 14,60,000           | 8,60,000         | 2.43      |
| 2014-15 | 910,00,000               | 8,25,000                | 14,25,000           | 6,00,000         | 1.73      |
| 2015-16 | 682,50,000               | 7,70,000                | 14,60,000           | 6,90,000         | 1.90      |

**Table 7. Economic Analysis of Tomato Crop Production**

| Year    | Yield (q/ha) | Gross expenditure (Rs.) | Gross returns (Rs.) | Net profit (Rs.) | B:C ratio |
|---------|--------------|-------------------------|---------------------|------------------|-----------|
| 2011-12 | 550          | 67,500                  | 1,80,000            | 1,12,500         | 2.67      |
| 2012-13 | 550          | 67,500                  | 1,80,000            | 1,12,500         | 2.67      |
| 2013-14 | 600          | 67,500                  | 1,80,000            | 1,12,500         | 2.67      |

|         |     |          |          |          |             |
|---------|-----|----------|----------|----------|-------------|
| 2014-15 | 625 | 70,000   | 2,05,000 | 1,35,000 | <b>2.93</b> |
| 2015-16 | 700 | 1,05,000 | 2,90,000 | 1,85,000 | <b>2.76</b> |

**Table 8. Economic Analysis of Chilli Crop Production**

| Year    | Yield (q/ha) | Gross expenditure (Rs.) | Gross returns (Rs.) | Net profit (Rs.) | B:C ratio    |
|---------|--------------|-------------------------|---------------------|------------------|--------------|
| 2011-12 | 300          | 67,500                  | 3,00,000            | 2,32,500         | 4.44         |
| 2012-13 | 300          | 67,500                  | 3,00,000            | 2,32,500         | 4.44         |
| 2013-14 | 313          | 75,000                  | 3,12,500            | 2,37,500         | 4.17         |
| 2014-15 | 325          | 80,000                  | 2,00,000            | 1,20,000         | 2.50         |
| 2015-16 | 350          | 87,500                  | 10,50,000           | 9,62,500         | <b>12.00</b> |

**Table 9. Economic Analysis of Birds in Poultry Unit**

| Year    | Birds in Poultry Unit (No.) | Gross Expenditure (Rs.) | Gross returns (Rs.) | Net Income (Rs.) | B:C ratio   |
|---------|-----------------------------|-------------------------|---------------------|------------------|-------------|
| 2011-12 | 125                         | 50,000                  | 95,000              | 45,000           | 1.90        |
| 2012-13 | 150                         | 60,000                  | 1,20,000            | 60,000           | <b>2.00</b> |
| 2013-14 | 150                         | 60,000                  | 1,20,000            | 60,000           | <b>2.00</b> |
| 2014-15 | 225                         | 90,000                  | 1,70,000            | 80,000           | 1.89        |
| 2015-16 | 250                         | 1,00,000                | 1,80,000            | 80,000           | 1.80        |

**Productivity Levels of Major Income Generating Activity**

The productivity level of seedlings of major five vegetables crops like Tomatoes, Capsicum, Chillies, Cauliflowers and Onion in Hi-Tech Vegetable Nursery at his farm were computed for the five years from 2011-12 to 2015-16 and it was found that Sardar Harbir Singh produced highest level of seedlings of Tomato (5700000), Capsicum (3600000), Chilly (5200000), Cauliflower (3500000) and Onion (91000000) as shown in Table 10.

**Table 10. Productivity Levels of Major Income Generating Activity**

| Year    | No. of Healthy Vegetables Seedlings Produced |                |                |                |                 |
|---------|--|----------------|----------------|----------------|-----------------|
|         | Tomato                                       | Capsicum       | Chilies        | Cauliflower    | Onion           |
| 2011-12 | 2700000                                      | 2400000        | 4000000        | 1600000        | 42000000        |
| 2012-13 | 3800000                                      | 3000000        | 4400000        | 3000000        | 42250000        |
| 2013-14 | <b>5700000</b>                               | 3500000        | 4400000        | 3000000        | 56875000        |
| 2014-15 | 4600000                                      | 3500000        | 4800000        | 3200000        | <b>91000000</b> |
| 2015-16 | 4800000                                      | <b>3600000</b> | <b>5200000</b> | <b>3500000</b> | 68250000        |

In nut shell, we can say that Sardar Harbir Singh doing well in all respect for soil health, eco-friendly, socially, economically and environmentally sustained agri-enterprises which plays an important role for sustainable economic development of the country as a whole. Productivity increases in agriculture can reduce poverty by increasing farmers’ income, reducing food prices and thereby enhancing increments in consumption (Diagne et al., 2009). It is also of considerable significance that when agricultural production increases through the use of improved varieties of crops in a given area, farmers and their communities derive added socioeconomic benefit. Such activities can increase the value of locally produced crops, generate local employment, stimulate local cash flow, and through processing, marketing, and related activities can bring about improvement in socio-economic status and the quality of life (Mwabu et al, 2006).

**Contribution of the farmer in terms of**

**i. New package of practices/management strategies:**

Different hybrids and varieties were evaluated and best one were adopted and vegetable seedlings were supplied in different states.

**ii. Saving or resources/inputs:**

Fertilizer, pesticide and water application has been reduced significantly with the different technologies.

**iii. Pollution & Soil health:**

Organic manures are used in nurseries. Only recommended pesticides are used on the recommendations of experts.

**iv. Breaking technology transfer barriers**

- Best hybrids and varieties are evaluated and seedlings multiplied and marketed.
- Seed treatment as per package of practices of CCS HAU Hisar.
- Raised seed bed nursery.
- Use of nursery media developed for the first time.

- Low cost tunnels for raising nurseries in winter.
- Micro sprinkler irrigation system.
- Drip irrigation system in vegetable cultivation.
- Updated with new technologies at his farm.

**References:**

- [1]. Chandra, P., Sirohi, P.S., Behera, T.K., and Singh, A.K. 2000. Cultivating vegetables in poly house. *Indian Journal of Horticulture* 45: 17-25
- [2]. Diagne, A., S. A. Adekambi, F. P. Simtowe And G. Biaou, (2009) The Impact Of Agricultural Technology Adoption On Poverty: The Case of Nerica Rice Varieties in Benin. A shorter version of the paper is being presented as contributed paper at the 27th Conference of the International Association of Agricultural Economists. August 16-22, 2009. Beijing, China
- [3]. MwabuGermano; Wilfred Mwangi; and HezronNyangito (2006) "Does Adoption of Improved Maize Varieties Reduce Poverty? Evidence from Kenya: Poster paper prepared for presentation at the International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12-18, 2006.



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