Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 03, Issue: 01 (JAN-FEB, 2023)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Off Season Vegetable Production

(*Preeti Yadav, Sumit Deswal and Sandeep Dagar)
CCS Haryana Agricultural University, Hisar (125004), Haryana, India
*Corresponding Author's email: sandeepdagar234@gmail.com

Abstract
Production of fresh vegetables outside their typical cropping cycle *i.e.*, before or after their normal growing season is referred as off-season vegetable production. It is generally practiced to supply vegetables in lean period, avoiding glut situation and fetch good prices. Adjusting planting time and variety, growing in different agro-climatic zone and protected structures like polyhouse, shade nets, plastic tunnels, hot beds etc. are appropriate ways for off season cultivation of vegetables. In this practise of cultivation, microclimate around the plant is modified to ensure proper growth and development of plant. If production will be qualitative and massive then there is chance of exports in foreign countries, providing year around employment opportunity and high earning. Furthermore, farmers can build their knowledge, learn ideas and specific techniques, develop confidence so that they can start this technology in commercial scale. Although off season vegetable production technology is best and provides higher prices of each product but requirement of technical knowledge, regular concern and supervision of government agencies, higher cost of production and risk factor due to possibilities of pest incidence inhibits the farmers to adopt this technology. In near future demand of vegetables will be double from now to feed continuously rising population, to fulfil that demand and live a happy, sound and healthy life Off-Season vegetable production technology is essential. Furthermore research, prioritisation, awareness, motivation, ensuring of availability of materials, resources, provision of fund should be provided in the field of off-season production from related and respective authorities as a great scope is associated to this practice of cultivation.

Keywords: Off season, Protected structure, Foreign export, Technical knowledge, Awareness

Introduction
Good health and nutritious diet are highly crucial components of today's life and are mostly fulfilled by vegetables result in growing demand of vegetables. The WHO panel on diet, nutrition and prevention of chronic diseases recommended a daily intake of at least 400 grams (or five daily servings with an average serving size of 80 gm) of fruits and vegetables, excluding potatoes, cassava and other starchy tubers. As per ICMR recommendation, 300g (green leafy vegetables: 50g, root & tuber: 50g & other vegetables: 200g) of vegetables must be provided daily to fulfill the nutritional need. Unfortunately, the total production of vegetables *i.e.*, 204.61 million metric tonnes is not sufficient to provide adequate nutrition to about 1407 million countrymen in India. Apart from this, many times farmers produce good amount of vegetable crops during its main season, which eventually leads to the severe market glut and fall in price. So, production of off-season vegetable apart from its main season can assure higher economic return to the farmers. This creates a dire need for the researcher community to think over better scientific approaches that can enhance the vegetables production from the existing landholdings; thus, a new concept of off-season

vegetable cultivation comes in picture. Production of fresh vegetables outside their typical cropping cycle i.e., before or after their normal growing season is referred as off-season vegetable production. Adjusting planting time and variety, growing in different agro-climatic zone and protected structures like polyhouse, shade nets, plastic tunnels, hot beds etc. are appropriate ways for off season cultivation of vegetables. For maximum utilization of available land and to enhance the productivity as well as to minimize the use of harmful agrochemicals *i.e.*, pesticides and fungicides, protected structures offers immense scope for the farming community of India. Apart from this, in order to meet the balance diet, seasonal vegetables only are not enough, off-season vegetable production is necessary which provides year around fresh vegetables. This articles reviews about the need, methods, advantages as well as disadvantages of off-season vegetable production.

Need of Off-Season Cultivation

- To fulfil the demand of growing population for vegetables
- Effective and efficient use of land and farm resources
- Supply vegetables during the lean period of supply
- Consumer preference for fresh vegetable even in off season
- Avoid storage problem during the on season
- Fetch good price by supplying vegetables to market during the off season

Methods of off- season vegetable cultivation

1. Adjusting Planting Time: Some vegetables can be grown by altering the time of cultivation. Summer vegetables crops can be grown 2 months earlier in warmer region. For normal season cultivation they are sown in months of
March-May and harvesting in June-August while for off season sowing two months earlier i.e., in Jan-Feb and harvesting in April-June can be practised.

2. Using Different Agroclimatic Region: India has diverse range of climate, geographical variation and agroclimatic zones. Through the utilisation of these variation (micro climates) same vegetable can be grown as seasonal in one place and marketed as off-seasonal in another place within same country. For example, farmers of higher hills produce cauliflower, cabbage and pea during summer and rainy season and supply it to lower plain areas in summer season as off-season vegetable. Similarly, the farmers of plains produce tomato, brinjal, sweet pepper during the winter season and supply to higher hills areas during winters.

3. Selection of Varieties with different maturity: There are some varieties which can tolerate the limiting factor and remains continues with growth and production. Many of hybrid varieties of vegetables are widely used for producing vegetables in early, late season. Use of these varieties has created the longer availability of vegetables production and year around production. For *e.g.*, variety Pusa Deepali, Pusa Meghna, Pusa Karthik Sankar variety of cauliflower can be available in September if sown early while Pusa Synthetic, Pusa Himjyoti and Pusa Shubhra remained available in November and snowball group in January.

4. Creating controlled Environment *i.e.*, protected cultivation: Main challenge for producing off season vegetable production is temperature, so to maintain temperature different types of structures are used:

- **4.1 Plastic Tunnel:** These are also known as row-cover o miniature greenhouse. It is easiest and cheaper method of controlling environment by creating small greenhouse-like structure with the help of polythene sheet that covers the rows of plant. Raised seed beds of 1m width are prepared and bamboo stakes are bent over it giving it a semi-circular shape. Polythene are tied over this structure and removed from the trenches when the plants start flowering to enable pollination facilitated by insects. Generally, this is practiced for raising seedling for summer time in winter season. The low-cost plastic tunnels can be used to protect the crops from excessive rainfall, frost and provide the

favourable environment by increasing the temperature for the production of better-quality crops over the period of time. Cultivation of crops like tomato, summer squash, melons, capsicum are very tough in open field during winter months under north Indian condition due to occurrence of cold wind. In such condition, these crops are generally cultivated in low tunnels/ row cover. Harvests of different cucurbits like muskmelon, round melon, bottle gourd, ridge gourd, cucumber, watermelon grown in low tunnels can be advanced by 3040 days over their ordinary developing season. This technology is highly suitable and profitable for the farmers living in northern plains of India.

- **4.2 Shade House:** A shade house is a low cost protected structure bounded by shade nets or any other woven material to allow required moisture, sunlight and air to pass through the gaps. And thus creates an suitable micro climate conducive to the plant growth. A shade house structure is made up of two basic components *i.e.*, frame and cladding material. The shade house frame provides support for cladding material and designed to protect against rain, wind and crop load. The life span of shade net house can be expected maximum up to 5 years depending on the climatic condition and the structural material utilized. Shade nets are available in the market in a wide range of shade percentages viz. 25%, 30%, 35%, 50%, 60%, 75% and 90%. The basic objective of shade net is to cut down radiation and temperature up to a certain extent during critical summer months (May-Sept.). Black colour shade nets are considered to be most efficient in reduction of temperature compared to other colours like white or silver, green etc. as because the black colour is the maximum absorbent of heat. Leafy vegetables like beet leaf and green coriander very successfully grown under shade nets, but it is also suitable for growing early cauliflower and radish cultivation during June to September months.
- **4.3 Polythene House:** Polythene house can be prepared in various sizes according to our requirement through the use of polythene sheets, bamboo stakes or galvanised iron pipes. In this type of structure mainly tall growing plants like cucurbits, tomatoes are grown. Many small and marginal farmers in hills are involving in the off-season plastic house tomato production.
- **4.4 Glass House / Green House:** A greenhouse is a structure with walls and roof made of transparent material, such as glass or plastic, in which plants requiring regulated climatic conditions are grown. In simple it is type of structure specially designed for vegetable production, protection of off-season plants against cold or heat. Glass house is provided with the facility to manage temperature, humidity, soil moisture, light etc as per requirement of plants. It is expensive but quality and yield in this structure is excellent quality. Greenhouse crop farming has the advantage of offering year-round production of crops, crop protection, increased yields, vegetable production in limited land sizes and superior quality produce.
- **4.5 Walk In Tunnel:** Walk in tunnel is a temporary structure made by using GI pipes or bamboo and covered with different cladding material depending upon the season in which the cultivation is proposed. It is mainly used for off-season cultivation of vegetables like bottle gourd, summer squash, cucumber etc. during winter season (December-mid February). The ideal size of a walk in tunnel can be of 4.0 m width and 30 m length (120 m^2). Overall, the height of this type of structure is enough for the workers to walk comfortably during inter-cultural operations.
- **4.6 Hot Bed:** Hot bed is a pile of organic manure which provides heat due to the metabolism of microorganisms. The principle on which the hot bed works is that fresh manure (cow dung/sheep yard manure and poultry manure) ready for fermentation generates heat which is actually utilized to quick the germination by providing suitable conditions for germination and faster growth of the seedlings which result in early maturity of the crop. It is practiced in cool seasons.

Advantages & benefits of off- season vegetable production

- Off-Season vegetable helps famer to get higher prices for their products.
- Consumers can have fresh products throughout the whole year even in off-Season also.
- If production will be qualitative and massive then there is chance of exports in foreign countries, providing year around employment opportunity and high earning.
- Farmers can build their knowledge, learn ideas and specific techniques, develop confidence so that they can start this technology in commercial scale.
- This technology may be suitable to small, marginalised, subsistence and commercial farmers.
- It also encourages farmers to make off-season vegetable production as their main profession, properly utilizes the farm and land.
- It helps to ensure food scarcity.
- Profit from off-Season planting per unit cultivation is high.
- Seed production is suitable through this technology.
- Creates employment to farm labourers all the year

Although off season vegetable production technology is best and provides higher prices of each product but requirement of technical knowledge, regular concern and supervision of government agencies, higher cost of production and risk factor due to possibilities of pest incidence inhibits the farmers to adopt this technology.

Conclusion

Due to rapid urbanization and industrialization, total cultivable land area is gradually depleting in our country. On the other hand, climate change and population growth impede progress toward achieving food and nutritional security. It is assumed that by 2050, we have to produce double the number of vegetables what we are producing today to feed the total population. So, it is the high time to think about cultivation of vegetables beyond open field condition. Also, there is great scope of off-seasonal products in international market which helps farmers to get best prices for their products, raise life, economic standard and also provides employment opportunity. Farmers must adopt this technology in small or large amount for their upliftment, better value for their product. This is only a possible way to meet the vegetable demand and also ensure food security. Government of each country must prioritise on off-season vegetable production technology, launch programs to promote it. In near future demand of vegetables will be double from now to fulfil that demand, live a happy, sound and healthy life also Off-Season vegetable production technology is essential. Furthermore research, prioritisation, awareness, motivation, ensuring of availability of materials, resources, provision of fund should be provided in the field of off-season production from related and respective authorities.