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# An overview of vigorous seed production of vegetables

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**Abstract**
Vegetables provide an abundant and inexpensive source of energy, vitamins, dietary fibers, minerals and phytochemicals. Seed is the basic and primary requisite is most critical input for sustaining an improving crop production and productivity. Seed is a mature fertilized ovule filled with seed coat called seed or it is a propagating substance. This review paper intended to recommend future strategies for a viable vegetable seed production. Vigorous seed production is usually a magnificent trait and provoked by agricultural tactics, genetics as well as by the environmental factors. Features like seed output of the vegetables, sizeable genetic variation, the prerequisite for advancement and acceptance of a good quality vegetable seed. Increasing the quality of seeds can increase the seed yield potential of the crop by significant folds. The status of vegetable production including indigenous one and consumption yet need further improvement. Vegetable seeds are the fastest growing category within the overall seeds market.

**Keywords:** Vegetable, seed production, vigorous, seed yield

## Introduction
India is the second largest vegetables producer in the world, next only to China. During 2017-18 the area occupy under vegetable was 10.26 million hectares and production of 184.40 million tonnes with an average productivity of 17.97 tonnes/ha in India. Vegetables constitute about 59.15 percent of total horticulture production in India. Vegetable production in the country, have led to increase per capita availability of vegetables from 264 gm/person/day in 2004-05 to 393.76 gm/person/day in 2017-18 (*Horticultural Statistics at a Glance 2018*). There is increasing demand of vegetables from rural to urban areas due to domestic consumption directly in food either in raw or cooked form. In its varying climatic conditions, the vegetables grown may vary from leafy to cole crops, bulb vegetables to tuber or root crops, flower vegetables to immature fruit vegetables etc, grown in different parts of the country. This implies that there is a substantial demand for vegetable seeds and increase in vegetable production in India [18]. The high demand for horticultural products, availability of suitable agro-ecology, and increasing irrigation schemes development focusing on vegetable production, have resulted in increased demand for quality seeds of improved varieties of various vegetable crops.

In addition, good quality seed is an important requirement for the vegetables and a huge demand that has been expanding, considering the fact that seed multiplication is economically pertaining for vegetable cultivars to contend commercially. But the healthy seed production is usually a magnificent trait and afflicted by agricultural approach, genetics as well as by the environment factors. Features like seed output of the vegetables, sizeable genetic variation, the prerequisite for advancement and acceptance of a good quality vegetable seeds. The vegetables have great role in boosting the economy of the country, due to that reason vegetables have potential to earn more income.

Several high yielding varieties of vegetables with improved technologies have been developed although availability of quality seed with insufficient quantities is a major constraint [1]. In order to meet this challenge there is need to initial seeds of released varieties are multiplied and maintain annually by understand and document farmers, preference for vegetable, variety of the preferred type(s), criteria for their preference based on their perceptions and popularize the improved seed production packages in vegetable crops, which would in turn provide comprehensive knowledge to the seed growers regarding the recent advances in technologies. Previously, vegetable seeds were produced by public sector organization like NSC, SFCI, SSCs, SAUs, ICAR institutes etc., but at present its share is marginal and a large portion of vegetable seed demand in the country is still met by the private seed companies only.

Use of quality seeds of improved varieties/hybrids of different vegetable crops has witnessed tremendous growth in vegetable total production and productivity [21]. Recently, despite of the ups and downs observed, the demand for vegetables especially for export is increasing.

**General principles of vegetable seed production**

**Selection of climatic conditions**

In different parts of the country, vegetables are grown in summer/kharif and rabi of the year. The rabi vegetables are grown in cool climate of winter season, which complete their life cycle and mature seeds in beginning of summer. Thus, the seed of rabi vegetables is produced at the maturity time i.e. the months of april and may whereas; the kharif vegetables mature their seeds in the months of september and october. The vegetables grown in summer/kharif and rabi season are shown along with their edible parts in below table1:

**Table 1:** Growing season & edible parts of distinct vegetables

| Summer/kharif season | Edible parts | Rabi season | Edible parts |
|---|---|---|---|
| Bottle gourd | Fruit | Carrot | Root |
| Ridge gourd | Fruit | Radish | Root |
| Watermelon/Muskmelon | Fruit | Turnip | Root |
| Snake gourd | Fruit | Onion | Bulb |
| Bitter gourd | Fruit | Garlic | Bulblet |
| Sponge gourd | Fruit | Cauliflower | Immature flower |
| Round gourd | Fruit | Cabbage | Leaves |
| Squash melon | Fruit | Broccoli | Immature flower |
| Cucumber | Fruit | Tomato | Ripe fruit |
| Pumpkin | Fruit | Palak | Leaves |
| Brinjal/ Eggplant | Fruit | Coriander | Leaves/ seeds |
| Okra | Immature fruit | Fenugreek | Leaves |
| Peppers | Immature green fruit/red fruit | Spinach | Leaves |
| Cluster bean | Immature pods | French bean | Immature pod/ Seed |
| Cow peas | Immature pods | Peas | Immature pods/ seeds |

**Selection of land**

- Land for seed production crop must be well prepared, well levelled field for uniform maturity and nearest to irrigation sources. Good land status enhances good seed germination, field emergence and stand establishment [15].

**Selection of area & location**

- Area should be free from volunteer plants, weed plants and other crop plants.
- Avoid areas where isolation is a problem.
- Prevalence of cool and dry weather is preferable. Avoid high temperature and relative humidity areas where germination is poor. Avoid coastal belts and marshy places and heavy windy areas.
- Avoid areas of endemic diseases and pests.
- Available of skilled labours especially in hybrid seed production of crops. Near the processing operations with transporting facilities and marketing facilities.
- For seed production, the crop should be grown in areas where dry seasons prevail at the time of seed maturity and extraction. The locations are also important in seed production to enhance seed yield with better quality [19].

**Classes of quality seeds**

Availability of vigorous seeds of improved cultivars is considered crucial for realizing productivity and adoption of cultivars in different agro-climatic conditions. Therefore, to approach the potentially realizable yield of a cultivar, production and distribution of quality seed is essential. The good quality seed should have the following characters:

- Genetic purity and uniformity and should conform to the standards of the particular cultivar.
- Disease free and viable seeds.
- Area should be free from admixtures of other crop seeds, weeds and inert matter.
- Acceptable uniformity with respect to size, shape and color.

The seed used for raising a seed crop should be of known purity and appropriate class of seeds. There are different classes of seed and there are different standards of inspection for each class [10, 17]. The three recognized classes of seed are:

1) **Breeder seed (BS):** Breeder seed is the progeny of nucleus seed produced by the eminent plant breeder/scientists who has developed a particular variety. Breeder seeds are carefully produced by highly skilled breeder/scientists in a controlled environment usually in research institutions, education centres or specialised seed companies. As a result, breeder seeds have the highest genetic purity level (100%). Breeder seeds are expected to be pure and are of the description of the breeder in terms of character and identity. Every other related variety of a particular crop seeds should be traceable to the breeder seeds. Breeder seed is subjected to monitoring which is conducted (at maturity stage/before harvesting) by breeder concerned and personal of certification agencies.
2) **Foundation seed (FS):** Foundation seed is the progeny of breeder seed and is produced and supervised by agricultural experts at university, NSC, HSDC, Govt. farms and invariably obtained from an authorized official agency while purchases of seed the following should be carefully examined. Foundation seed is intended for production of certified seed.
3) **Certified seed (CS):** Certified seeds are produced from foundation seeds having followed a set of approved procedures (also called protocols) established by the releasing institutions and or government agencies responsible for seed release in the country. For seeds to be accepted as certified, they must maintain genetic purity and identity of the variety as described by the breeder. To be certified, the seed must meet the prescribed requirements regarding genetic purity, identity as well as quality attributes. It is basically produced by state SSC and NSC through contact growers for general distribution.

**Seed rate**

Seeds should be wholesome (free of physical damage, pest infestation and diseases) and should be adequately dried before being stored in a clean and well-ventilated area. Farmers are encouraged to procure their seeds from the reliable seed suppliers and to use certified seeds where available.

Seeds should come from a stock kept in good condition in order to preserve their viability. Row planting is the preferred method because it ensures optimum plant population, higher yields and the development of good-quality seed [14]. The amount of seeds to be used depends upon their purity, viability, planting time, soil conditions, and size and vigour of the plant [22, 23]. Vegetable crops require different seed rate as shown in table 2:

**Table 2:** Seed rate (kg per ha) of vegetables varieties

| Vegetables | Pure varieties (kg/ha) | Hybrid varieties (kg/ha) |
|---|---|---|
| Watermelon | 3.5 | 3.5 |
| Ridge gourd | 3.0-4.0 | 1.5 |
| Bottle gourd | 3.0-4.0 | 1.5 |
| Sponge gourd | 3.0-4.0 | 1.5 |
| Muskmelon | 3.0 | 3.0 |
| Snake gourd | 1.5 | 1.2 |
| Bitter gourd | 3.0-4.0 | 1.8 |
| Round gourd | 3.5 | 3.0 |
| Squash melon | 1.0 | 1.0 |
| Cucumber | 1.5-2.0 | 1-1.2 |
| Pumpkin | 1.0 | 1.0 |
| Sweet pepper | 1.0-1.25 | 0.2-2.5 |
| Hot pepper | 1.0-1.2 | 0.2-0.25 |
| Brinjal/Eggplant | 0.4-0.5 | 0.15-0.2 |
| Okra | Summer 18, Kharif 10-12 | 2-2.5 |
| Cluster bean | 10 | - |
| Cowpea | 20-25 | - |
| Turnip | 3-4 | - |
| Onion | Bulb-1000, Seed-8-10 | Bulb-1000, Seed-8-10 |
| Cauliflower | 0.4-0.5 | 0.25 |
| Cabbage | 0.4-0.5 | 0.25 |
| Broccoli | 0.4-0.5 | 0.3-0.4 |
| Tomato | 0.4-0.5 | 0.10-0.15 |
| Lettuce | Direct 1-2, Seedling 0.275 | - |
| Coriander | 10-12 | - |
| Fenugreek | 10-12 | - |
| Spinach | Summer 25-30, Winter 10-15 | - |
| French bean | Bush type-70-80, Pole type-25-30 | - |
| Garden Pea | 140-150 | - |
| Carrot | 4.0 | - |
| Radish | 8-10 | - |
| Beetroot | 6.0 | - |

**Planting preference**

- Planting of vegetable seeds for seed production is basically done by direct seeding or transplanting of glasshouse grown seedlings.
- Biennial vegetable seed production, however, can be achieved using two planting techniques.
- The seed-to-seed method is done by planting biennial seed, allowing the resulting plant to overwinter without being transplanted, and harvesting the seed crop the following season.
- This method does not permit the selection or rouging of root or other genotypic characters.

  A majority of carrot and onion seed crops are produced by this method which is less expensive and complex than the root-to-seed method [24].

**Isolation distance**

For production of pure/hybrid seed, the field must be isolated from other varieties of the same crop, cultivated species and their wild relatives if any to make sure the production of genetically pure seeds. Isolation distance is the minimum separation required between two or more varieties of the same species for the purpose of keeping seed genetically pure. Species in the same genus or family often have similar minimum isolation distance requirements, but occasionally certain varieties within a species may require larger isolation distances. Many of these crops are highly cross pollinated; hence isolation distance for both foundation and certified seed production should be maintained as per the seed production standard [19]. The isolation distance between cross compatible varieties can be achieved by the following ways:

a) **Distance isolation:** The isolation distance for cross-pollinated varieties is comparatively more but for self-pollinated varieties the isolation distance from other variety should be relatively less. The isolation distance also varies with the direction of insect flight (in case of insect pollinated varieties) or the direction of winds (in case of wind-pollinated varieties).
b) **Time isolation:** It will allow the seed production of different varieties of the same crop at the same place each year. If the season is too long enough to allow two production cycles of the cross compatible crops then they are isolated by time. For example, early and mid-maturity group of cole crops grown for seed production can be isolated by time. In a result, minimum isolation distance could be obtained (table 3).

**Table 3:** Minimum isolation distance of different vegetables for seed production

| Vegetable crops | Minimum isolation distance (metres) | |
|---|---|---|
| | Foundation seed | Certified seed |
| French bean | 10 | 5 |
| Cowpea | 10 | 5 |
| Cluster bean | 10 | 5 |
| Garden pea m | 10 | 5 |
| Cowpea | 10 | 5 |
| Garlic | 5 | 5 |
| Lettuce | 50 | 25 |
| Tomato | 50 | 25 |
| Okra | 400 | 200 |
| Lettuce | 100 | 50 |
| Chilli & Capsicum | 400 | 200 |
| Brinjal | 200 | 100 |
| Cauliflower, Cabbage & Knol khol etc | 1600 | 1000 |
| Carrot | 1000 | 800 |
| Onion | 1000 | 500 |
| Cucurbits | 1000 | 500 |
| Carrot, Radish and Turnip | 1600 | 1000 |
| Spinach | 1600 | 1000 |
| Coriander | 200 | 100 |

**Vigorous roughing**

The selective removal of undesirable plants from the seed production plot/field on the basis of visual field inspection, in order to remove one or more (genetic purity, disease free) attributes of a seed lot to be harvested. Hence, rouging is a technique that is used in seed production to maintain genetic purity of the variety [9]. It should be done throughout the life cycle, but much care has to be given prior to the stage at which they could contaminate the seed crop. The off types may occur in a crop due to a variety of the morphological

types within a crop. The cross-pollinated vegetable crops like cucurbits, cole crops, onion etc) shows high morphological diversity than self-pollinated) crops (e.g. tomato, peas, beans, fenugreek etc). Consequently, the varieties of self-pollinated crops are generally more uniform and stable than varieties of cross pollinated crops [12].

**Different stages of rouging**

1) **Before flowering:** On the basis of vegetative characters (plant growth, foliage morphology, color etc.) the off-types are removed from seed production field.
2) **At flowering:** The early and late varieties can be easily identified on the basis of sex expression and curd maturity in cucurbits and cauliflower respectively, and flower initiation time in solanaceous crops. Contamination is relevant during flowering and frequent inspection and removal of off-types can help maintain genetic purity.
3) **At fruit development stage:** True to type of developing fruit (fruit shape, size, color, color of ripen fruit (green, yellow, red) is checked and on the basis off-type plants are rouged out.
4) **At maturity stage:** The plants showing late maturity of fruits in the early variety and vice versa should be removed immediately from seed production field.
5) **Threshing and seed extraction:** Threshing is varies from crop to crop and it can be done by hand or machines. Threshing machines should be properly cleaned to avoid admixture. Usually, seeds should be extracted from dry fruits or from fruits in which the seeds are wet at the time of extraction.

**Pollination behaviour**

Pollination plays an important role in genesis and evolution of a plant species. Pollination followed by fertilization and consequently development of fruit and seed not only produces foods but also is one of the important building block of crop improvement. On the basis of pollination behavior [12] in vegetables are generally classified into 3 distinct groups. They are-

1. **Self-pollination:** In these crops, pollination involves the stigma of the same flower that produces pollens or other flowers at the same plant, which effect natural self-fertilization. Extents of natural cross pollination in these crops are normally less than 10% and hermaphroditism is predominant here.
2. **Often Cross-Pollinated:** In these crops, self-pollination is predominant but due to morphological nature of the crop natural cross-pollination exceeds 25%.

**Cross-pollinated:** In these crops pollens from the flower of one plant is transferred by some agents (insects, wind, humans etc.) to the stigma of flowers of another plants to effect pollination. Generally some morphological barriers which might be controlled genetically or physically favours cross pollination. In cross-pollinated crops natural cross pollination exceeds greater than 60%. Vegetable crops have different pollination behavior as shown in beneath table 4:

**Table 4:** Pollination behavior of vegetable crops

| Vegetable crops | Pollination type | Pollination mechanism |
|---|---|---|
| Bottle gourd | CP, Monoecious | Insects |
| Sponge gourd/Ridge gourd | CP, Monoecious | Insects |
| Watermelon/muskmelon | CP | Insects |
| Watermelon/muskmelon | CP, andromonoecious | Insects |
| Snake gourd | CP, Monoecious | Insects |
| Bitter gourd | CP, Monoecious, Dioecious | Insects |
| Round gourd | CP, Monoecious | Insects |
| Squash melon | CP, Monoecious | Insects |
| Cucumber | CP, Monoecious, Dioecious | Insects |
| Pumpkin | CP, Monoecious | Insects |
| Brinjal/Eggplant | OCP | Insects |
| Okra | OCP | Insects |
| Hot pepper/Sweet pepper | OCP | Insects |
| Cluster bean | SP | - |
| Cow peas | SP | - |
| Carrot | CP, Protandrous | Insects |
| Radish | CP, self incompatible | Insects |
| Turnip | CP | Insects |
| Onion | CP | Insects |
| Cauliflower | CP | Insects |
| Cabbage | CP | Insects |
| Broccoli | CP | Insects |
| Tomato | SP | - |
| Lettuce | Mainly SP, out-crossing 1- 6% | Insects |
| Coriander | CP | Insects |
| Fenugreek | SP | - |
| Spinach | CP | Insects |
| French bean | SP | - |
| Peas | Mainly SP | - |

CP: Cross pollination, SP: Self pollination, OCP: Often cross pollination

**Grow out test**

Genetic purity of any variety is confirmed by carrying out through grow out test (GOT i.e. growing of progenies during off season in the field) and electrophoresis. These tests are essential part of seed certification of hybrids and high value seeds.

**Seed Standards**

It refers to the field inspection of the harvested produce as well as the manner of harvesting, transporting, processing and packing. Unless, a seed certification agency keeps track of harvested produce until it is packed and sealed the identity of the lots cannot be assured. Seed certification agency should lay down standard for processing plants. In addition, field and seed standards, such as isolation distances, inseparable other crop seeds, weeds, plants affected by seed borne diseases, genetic purity, percentage of pure seed, other crop and weed seeds, inert matter, moisture content, germination and insect damage, should be prescribed for successful accomplishment of the certification [16].

**Harvesting and packaging**

- Seed maturity denotes the stage of development when the seed reaches its maximum dry weight and marks the end of seed-filling period. Proper time and method of harvesting should be used for different vegetables [6]. Only disease free pods/fruits should be selected for seed productions from healthy crop. The harvest of pods, fruits and seeds should be done early in the morning or late in the evening to avoid seed shedding. The threshing should be done when harvested material is dry by manual methods. Threshing yard should be near to the field to avoid seed losses. Threshing yard should be kept raised for keeping harvested material such as pods, fruits and seeds to avoid any type of spoilage. The clean seed of particular vegetable should be treated with pesticides to avoid store grain pests such as fly, termite etc.
- The packing material used for seed storage plays important role to maintain seed's longevity during storage. The properly prepared and cleaned seed should be put in cloth bags for packing purposes. The bags should necessarily be labelled with name of variety, grower's name, weight of seed and date on which seed has been prepared for marketing. Avoid using tins or plastic bags for packing seeds, which spoil seed due to moisture.

**Purpose of vegetable seed production**

The purpose of vegetable seed production is adapting a set of technology first to cultivate particular vegetable crop and its variety under improved agronomic practices such as soil selection, land preparation, nursery raising, sowing time and methods and irrigation, control of weeds, insect pests and diseases, as well proper harvest or picking of the vegetables. The vegetable seed production and preparation mainly depends upon crop maturity and time of picking/ harvesting. In spite of, for seed production purposes, vegetables are grown with special attention to the cultural practices (including seed selection, land preparation, sowing time and method, after care, rouging and selection of healthy seed plants/ harvesting, threshing, cleaning and storing of seed for sowing in next season. Specific leafy vegetables such as coriander, fenugreek, spinach, lettuce etc need frequent cuttings and at final cutting such vegetables are left for seed. Whereas in some other vegetables, seed is produced at the time of picking and when such vegetables become unproductive and or season get over, at that time crop is to be left for seed. Particular rabi grown biennial type of vegetables such as radish, carrot, turnip, beet, cauliflower, cabbage, onion etc, which do not produce their seeds in the first season due to completing vegetative growth. Such vegetables produce floral shoot and mature seeds in the end of second season. The fruit bearing vegetables such as brinjal, tomato, gourds, melons, cucumber, okra, peas, beans, peppers, etc. are normally left to dry their fruit structures for maturing seeds, when such vegetables become un-productive or when season no longer exits. By this practice, un-healthy seeds are produced, but a need is to produce disease free, good quality and optimum seed yield [7, 13, 14].

**Table 5:** Important vegetables seed production yield (kg per acre)

| Summer/kharif vegetables | Seed yield | Rabi Vegetables | Seed yield |
|---|---|---|---|
| Bottle gourd | 150-170 | Carrot | 140-160 |
| Sponge gourd/Ridge gourd | 100-130 | Radish | 200-240 |
| Watermelon/muskmelon | 120-130 | Turnip | 240-280 |
| Snake gourd | 100-120 | Onion | 340-400 |
| Bitter gourd | 80-100 | Cauliflower | 140-160 |
| Round gourd | 100-130 | Cabbage | 180-200 |
| Squash melon | 100-130 | Broccoli | 140-160 |
| Cucumber | 100-130 | Tomato | 40-50 |
| Pumpkin | 100-130 | Palak | 160-200 |
| Brinjal/Eggplant | 100-110 | Coriander | 200-250 |
| Okra | 350-400 | Fenugreek | 300-400 |
| Hot pepper/Sweet pepper | 100-120/40-60 | Spinach | 160-200 |
| Cluster bean | 260-280 | French bean | 400-500 |
| Cowpea | 280-400 | Garden Pea | 450-500 |

**Seed extraction methods in vegetables**

**Dry method**

Seed drying is the process of reducing seed moisture naturally using the sun and wind in fields or artificially using a dryer to recommended levels for storage. Optimal seed moisture content for storage depends on the species and the intended period of storage. It is therefore important to adopt an appropriate drying regime, in which the relative humidity and temperature of the drying air are regulated to achieve the target moisture content. The fully matured and dried fruits are harvested and kept under sun light for 2-3 days. After removal of seeds, these are dried under sun light between 8.00-11.00 am and 2.00-5.00 pm to reduce the high moisture content. The seeds of okra, chilli, sponge gourd, ridge gourd and bottle gourd [3] are extracted by dry method. The seeds of Radish are harvested when pods become brown and parchment like when the seeds are near maturity (Tomar *et al*., 2016). The harvesting of carrot umbels should be done where the secondary umbels fully ripe and third under umbels have started to turn brown.

**Wet Method**

This method is used for seeds extraction of brinjal, tomato, bitter gourd, cucumber, muskmelon, ash gourd, round melon, long melon, watermelon [11] etc. There are two methods of seed extraction under wet method:

**Mechanical seed extraction**

- This method is mainly used in vegetables like, chilli, brinjal, tomato etc.
- In chilli, dried fruits fed through feed hopper of seed extractor are subjecting to beating action and thereby the seed are separated and discharge through the outlet. The seed separated from hulls manually and seed extractor efficiency was of as 96%.
- In brinjal, pulpers can also be used for crushing the fruits. Before using pulpers sufficient of water is added and after pulping stirred well. Treatment combination of 2

mm concave clearance + 8.5 m/s cylinder peripheral speed + 1.76 of per hour feed rate produced the highest seed rate extraction (3.327 kg/hr) on extraction of seed with vegetable seed extractor.

- In tomato, the ripened fruit is fed into the pulper machine. The pulp containing the seed collected separately from the outlet washed in water then shade dried [4, 5].

**Acid method**

In this method fully ripened matured fruits are harvested and crushed along with pulp. The pulp is taken in plastic container or wooden container and the commercial HCL added. The concentration of HCL was varies from vegetables to vegetables. The acid and pulp are mixed thoroughly and kept for some time. The corrosiveness of the acid removes the mucilage adhering to the seed and makes the seed free of pulp. The seeds are washed 4-5 times thoroughly with water to make free of acid. The seed extraction is quicker in this method. Seed are also bright in colour with good germination ability and free from fungal disease attack.

**Fermentation method**

The fruits are crushed in a non-metallic container and kept as such for fermentation for 2-3 days. It has been observed that two days fermentation of the fruits is the best for getting quality seeds. During fermentation the seeds get detached from the adhering pulp and settles to the bottom of the container. The seeds are separated, washed thoroughly and dried under shade to the desired moisture level. The seed recovery is less compared to other method of seed extraction. The seeds become dull coloured due to fermentation of pulp and also due to the fungal load in the seeds.

**Alkali method**

Fully ripened matured fruits are harvested and crushed to make pulp. In Tomato, to hasten the fermentation process 0.5% sodium bicarbonate (500 g dissolved in 10 lit. of warm water is added to the pulp and allowed to remain for a day. Then, the seeds are separated and washed free of alkali with water.

**Conclusion**

Vegetable seed production business ever has huge scope to success and will play an important role in economy in countries like India. Making available quality seeds to the farmers in time and in sufficient quantity at reasonable prices. The most important and feasible approach to enhance the productivity of vegetable crops would be the production of quality seed and cultivation and demands of vegetables in our country is increasing day by day. Seed production of vegetables is an important economic activity. The importance of good quality seed can hardly be over emphasized as it is crucial for high productivity. Several high yielding varieties of vegetables with improved technologies have been developed but availability of quality seed insufficient quantities is a major constraints. In order to meet this challenge there is need to popularize the improved seed production packages in vegetable crops, which would in turn provide comprehensive knowledge to the seed growers regarding the recent advances in technologies. Local seed management practices, such as seed selection, cleaning, treatment, or separate storage and also other agronomic practice ensure to improve or maintain seed quality, productivity and farmers preference finally increase productive land.

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