



## Managements of vegetables nursery for quality vegetables production

Shamsher Singh and Manoj Kumar Singh<sup>1</sup>

Krishi Vigyan Kendra, Indian Institute of Veterinary Research, Malhana, Bankatamishra (Majhauriraj), DEORIA (U.P) INDIA

<sup>1</sup>Krishi Vigyan Kendra, Pampoli, EAST KAMENG (ARUNACHAL PRADESH) INDIA

Proper nursery management is first and foremost activity for getting quality planting material and successful crop production. As nursery is the place where young seedlings, saplings or any other planting materials are raised and nurtured before planting them in the main field. For raising a good crop, it is utmost essential that seedling should be healthy, vigorous and disease-free.

### Advantages of nursery raising :

- It is very convenient to look after the tender seedlings.
- Timely and careful look after tender/younger seedlings in small area against insects, pest, diseases and weeds.
- Reduced field management costs.
- Several vegetables seeds are very small in size.
- Growth media can be provided.
- It is possible to provide favourable growth conditions
- In early stage, seedlings need protection from hot sun, heavy rains, severe winter, frost and winds of high velocity.
- Early transplanting of crop is possible.
- Shorter cropping cycle therefore can get earlier planting and harvest
- Economy of land and vegetable seeds are very expensive particularly hybrids, so we can economize the seed by sowing them in the nursery.
- Crop grown by nursery raising is quite early and fetch higher price in the market, so economically more profitable.
- There is saving of land and labour as main fields will be occupied by the crops after 1 month. More intensive crop rotations can be followed.
- More time period for preparation of field at which crop is to be grown.

**Site selection :** Nursery site should be at higher place, well drained, free from water logging and sunny situation. Soil should be sandy loam to loam, loose, friable, fertile, healthy and close to the neutral (pH 7.0). The site should be nearby water bodies to provide irrigation timely and

well protected from pet and wild animals.

**Preparation of seed-bed :** Nursery beds should be 1.00 m-1.20 m wide to facilitates intercultural operations without trampling the bed and length as per the need/convenient preferably 4-5 meter. The seed-bed is usually kept raised about 15 cm high and 30 to 50 cm walking space between two beds to provide proper drainage of excess water and level of the bed surface is also made slightly raised in the centre with a little slope on both the sides. The nursery beds are dug 3-4 times with the spade and incorporated well rotten farm yard manure or compost @ 4-6 kg or vermicompost 500g per square meter a few days before final preparation. If the soil is heavy, mix 2-3 kg sand per square meter so that the seed emergence may not be hampered. Generally the soil mixture of the nursery-bed should have 2 parts of garden soil and 1 part each of sand and leafy-mould (humus). During the digging, clots, stones and weeds from the field should be removed and land should be levelled. Nursery beds should be prepared in the east and west direction and line should be made along the width of the beds for seed sowing.

**Seed bed treatment :** The nursery soil should be properly treated to check soil borne disease before sowing the seeds. Seed Nursery soil is covered with transparent polythene of 100 to 200 gauge thickness for 4 to 6 weeks



during the period of high temperature and solar radiation. Before laying polythene, soil moisture of nursery bed is brought up to field capacity to increase the latent heat and thermal sensitivity of resting structures of soil-borne pathogens, harmful pests and weeds.

Nursery beds should be drenched with Formalin (40 – 50 ml/litre water) @ 4-5 litre of water per square meter soil surface to saturate it up to a depth of 15-20 cm about 15 – 20 days before sowing and cover the drench beds with polythene sheet for 15 days and put wit soil at the side and or before seed sowing, beds should be treated with 0.3 per cent solution of captan or thiram (5 litres/m<sup>2</sup>) to reduce the soil born fungal diseases. Seven dust @ 2g/ kg of seeds mixed to control insects. Burning of leaves or straw on the beds is quite helpful in controlling certain soil borne diseases and pest.

**Seed treatment :** Before sowing, seeds should be treated with Thiram/Captan @ 2 g/kg of seed. In tomato, it is also advisable that seeds should be treated with Azospirillum or Microphos bacterial culture before sowing the seeds. Seed can also be soaked in cow urine or hot water of 50<sup>o</sup> C for 30 minutes before sowing to check seed borne disease.

**Seeds sowing :** The common practice is to broadcast seeds in nursery-bed but sowing of seeds in lines is preferred for proper germination, weeding, hoeing and plant-protection operations. The seeds are sown in furrows 5-7 cm apart along the width of bed and 0.5-1.0 cm between seeds at a depth of around 1.0 - 2.0 cm with the help of bamboo stick. The beds should be covered by a layer of paddy straw, dried grasses or banana leaves for 3-5 days to induce early and better seed germination, suppresses the weeds, protects from direct sunlight and raindrops and birds etc. Cover the seeds 0.5 to 1.0 cm thick with treated fine mixture of sand, soil and well rotten

sieved FYM or leaf compost (1:1:1). The beds require light irrigation manually with the help of sprinkler or rose can daily morning and evening till germination. In cauliflower, cabbage broccoli and knoll-khol, a nursery-bed of 115 m x 1.2 m is sufficient to raise seedling for one hectare area.

**Care after sowing :** The mulching material is removed as soon as sprout comes out. To protected tender seedlings from strong sun or rains the beds should be covered with a thatch prepared with straw, leaves, plastic or green shade net and placed about 1 m high from the soil surface by the use of suitable support. Irrigation in the beds depends upon the weather condition. If temperature is high, open irrigation is applied. Need not to irrigate the beds during rainy days. Irrigate the beds with 0.5 per cent urea or 1.0 per cent Calcium Ammonium Nitrate solution at early stage of seedlings to accelerates the seedling growth. Weeding in nursery beds is an important to get healthy seedling. It can be done either manually or spray pre emergence herbicide *i.e.* Stomp @ 3 ml/litre on the nursery beds after the seed sowing. Thinning is a very important operation to remove weak, unhealthy, diseased, insect pests damaged and dense plants from the nursery beds keeping distance of about 0.5 to 1.0 cm from plant to plant to facilitates balance light and air to each and every plant.

**Hardening of seedlings :** Hardening of seedlings before transplanting is essential to withstand transplanting shock and better setting in adverse environmental conditions in the main field. Hardening can be done remove of all the shedding nets, polythene sheets etc, exposure to the full sunlight and withholding of irrigations slowly and slowly 5 -7 days before uprooting seedlings. In normal case watering may be with held 3-4 days before transplanting.

**Transplanting :** Generally in most of the vegetables, transplanting in the main field is done, when seedlings attain

**Table 1 : Seed rate and sowing time**

Crop	Seed rate (g)		Sowing time
	OP varieties	Hybrids	
Tomato	400-500	250-300	September - October
Brinjal	400-500	200 - 250	July - August
Chilli	600-700	350-400	January-February and July - August
Capsicum	650	300-350	September - October
Cauliflower: Early	600	250 - 300	Early season- June-July
Mid and late	400-500		Mid season – August-September
			Late season- October-November
Cabbage: Early	500	250 - 300	Early season- June-July
Mid and late	400		Mid season – August-September
			Late season- October-November
Broccoli	500	250 - 300	September - October
Knol-khol	500	250 - 300	August-November

their proper height of 10-15 cm at 4-6 leaves stage about 25 – 30 days old. Too old or too young seedlings both are unsuitable for transplanting in the main field. Before transplanting the nursery beds are thoroughly watered to facilitate the removal of seedlings from the seed bed without much injury to the roots. Preferably transplanting should be done during cool hours of the day (evening) so that plants may establish themselves at night and may recover from the shock of transplanting before the dawn.

The seedlings should be placed vertically in the centre of the small pits made in the field and the soil near the seedling roots is pressed down with the fingers to make it compact. Immediately after transplanting the field should be irrigated. During transplanting care should be taken to protect the seedlings against wilting by frequent sprinkling of water on them and by covering the root zone by moist soil or leaves.

Regular irrigation is necessary after transplanting. Lanky seedlings with sickly appearance may be removed and gap filling may be done by healthy seedlings. Any attack of disease or insect must be controlled immediately. **Raising seedlings under protected condition :** Now-a-days nursery raising of vegetables has become a specialized job. High and low temperatures excess rains, drought, hot and cold winds affect nursery raising. Raising seedlings in low-cost polyhouses and low tunnels is easier and early nursery can be raised.

Productions of seedlings of early vegetable crops often have problems in high rainfall areas. The use of transparent plastic sheets as low tunnel provides ideal conditions for successful raising of seedling than conventional methods. Now a days production of vegetables seedlings under polyhouse has become easier and commercial. During winter season nursery is ready for transplanting 10-15 days earlier inside polyhouse compare in open condition. The time taken for seed germination and seedling growth



is reduced under polyhouse/low tunnel if sown in winter months for spring transplanting.

The utility of low-cost polyhouses for raising of seedlings of cucurbitaceous vegetables in winter months to harvest early summer crops has been very successful and commercially adopted by farmers in cucurbit growing areas. The seeds sown in polybags show early germination and make faster growth under protected cover. When outside conditions are favourable, seedlings are transplanted along with earth ball after removing polythene in the open field in early spring, the crop starts flowering and fruiting in very short time. This technique is capable of giving highly remunerative yields in northern plains. Besides, the seedlings of tomato, brinjal and chilli also get ready for transplanting in short time for spring planting.

The use of shade and agronets has been found very effective in raising of seedlings when temperature is high. Shade reduces temperature by 5°C to 10°C and protects the seedlings from sun scorching and harmful effects of high temperature. Agronet protects the seedlings from insects and reduces the vector-borne viruses infestation and damage by other insects.

#### **Major diseases and pest control of vegetable nursery:**

**Damping-off :** Damping off is a very serious disease in the nursery. Pre-emergence death of seeds is seen. In first instance girdling takes place on the stem near base of the stem and seedlings bent down near the ground and die. Damping off affected seedlings should be removed from the seed bed and buried in the soil otherwise spread will be more. Do not raise the seedling same site every year. Treat the nursery beds as discussed above. Drenching nursery beds @ 4 l/m<sup>2</sup> with Carbendazim (1.5 g/l), Captaf (2 g/l) or mixture with a Mancozeb (0.25%) and Carbendazim (0.5 %) is recommended on the appearance of Damping-off.

**Leaf miner:** It is very small sized insect enter in the leaves from margin side and move from one place to other by eating the chlorophyll. Initially the infected part of the leaves become brown and later on dry. Spray neem seed kernel extract (4%), neem formulation (2-3%) and chemicals Monocrotophos or Metasystox 1.5 ml/litre of water is necessary to prevent leaf minor.

**Leaf eating caterpillar:** Leaf eating caterpillar larvae gregariously feed and skeletonise the leaves. Spray neem seed kernel extract (4%), neem formulation (2 - 3%) and Cypermethrin 1.0 ml/litre of water is useful to prevent leaf eating caterpillar.

Received : 15.09.2015

Revised : 01.11.2015

Accepted : 15.11.2015