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PROTRAY RAISING OF VEGETABLE NURSERY SEEDLINGS

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Vegetable crops are mostly propagated through the seeds and raising seedling nursery for vegetable crops is very difficult if the protocol is unknown. Raising of vegetable seedlings in protray is gaining importance day by day due to the establishment of robust seedlings in the main field. Healthy seeds and seedlings are the first and most important elements for every vegetable crop to reach its maximum yield potential. Quality seeds or seedlings have become increasingly important to vegetable farmers in recent years (Bharathi *et al.*, 2014). A large amount of the land under vegetable agriculture in India is now seeded with hybrid seeds, which are more expensive but provide greater yields and higher quality products. Because seeds are expensive, several vegetable crops such as tomato, brinjal, capsicum, and cucurbits are transplanted after growing in a nursery under protected circumstances to obtain maximum germination count and good plant establishment. One such method that meets the aforesaid need is seedling growth in protrays or plugtrays. Because of the apparent benefits to both the nursery growers and the farmers, this technique is quickly growing as an agro-industry in India (Pandiyaraj *et al.*, 2017).

Methodology

Selection of portrays

Selection of portrays and the number of cells depends upon the requirement of the land and demand of the seedlings. Generally, the number of cells ranges from 72 to 800 in a standard tray (53.7 X 27.5 cm). The size of the cell is significant since it determines the quantity of media needed as well as the ability to store water. Seedlings grown in bigger cells

grow taller and weigh more than those grown in smaller cells. Use protrays with blocks of 1.5-2.0 m² for tomato, brinjal, and all sorts of vine vegetables, and protrays with blocks of 1.0-1.5 m² for capsicum, chilli, and cauliflower crops (Reddy, 2019).

Preparation and sterilization of media

Media selection is an important aspect for nursery raising and it should be selected based on the type of seedlings to be raised. Physical and chemical properties of the media affect the germination and establishment of the seedlings. The important physical media components are water, air and nutrient retaining capacity of the media for optimum root growth. pH of the medium also affects the germination (Pandiyaraj *et al.*, 2017). The media selection should be done in a such a way that it should retain optimum moisture neither more nor less moisture. Generally used media for production of seedlings in nursery are cocopeat, vermiculite, sphagnum peat, etc. The selected media should be prepared in these combinations of cocopeat, vermiculite and perlite in 3:1:1 ratio. The prepared media should be sterilized before filling in protrays.

Sowing of seeds

One seed should be sown per cell. Before sowing the seeds, they should be treated with recommended biofertilizers, biopesticides, insecticides or fungicides to avoid pests and diseases. The recommended order for the treatment of these chemicals are: insecticides-fungicides-biofertilizers.

Irrigation

Light irrigation should be given with rose can or overhead irrigation can be given with fine nozzles as mist or a spray after sowing of the seeds and care should be taken to maintain the proper moisture in the protrays by spraying of water at regular intervals. Excess watering should be avoided as it favours foliar and root rot diseases.

Light

Light is an essential environmental component that influences germination and development of the seedling. Optimum lighting should be provided. Avoid the direct exposure of seedlings to sun as it leads to scorching of seedlings. Light may also be used to prepare seedlings before transplanting them into more adverse surroundings.

Germination

Cover the seedling tray with black polythene sheet immediately after sowing and watering to provide optimum humidity and warmer temperature in the pro-tray for the germination of seeds. After the seedling emergence remove the polythene sheet. The optimum temperature in the root zone is essential for various vegetable seeds to germinate. For Tomatoes and Brinjal: 21°C – 24°C; chillies and capsicum: 28°C – 32°C. During the first four weeks of seedling growth, the optimum root zone temperature is 26 °C to 29°C and 20 °C to 26 °C during the fifth and sixth weeks (Reddy, 2019).

Spraying of fertilizers

Nutrition is an important aspect for the healthy establishment of the seedlings. All of the essential elements required for optimal growth and development of nursery plants are supplied by nutrition in the form of organic and inorganic sources. Artificial application of nutrients through foliar spray should be provided even though some amount of nutrients will be present in the media and in seed treatment with biofertilizers. Spraying 0.3 percent (3g/litre) water soluble fertilizer with poly feed (19 all with trace elements) twice (12 and 20 days after sowing) to promote seedling development. Phosphorus with minimal nitrogen is essential for improved root development. On the 12th day following germination, apply a root drenching @ 12:61:00. 15 days before transplanting, a micronutrient mixture can be sprayed. Any nutritional deficiency can cause poor and stunted plant development, resulting in poor performance (Reddy, 2019).

Hardening

It is the gradual exposure of the seedlings from the protected condition to normal environmental conditions. Seedlings should be hardened before transplanting into the main field to avoid transplanting shock and to reduce the stresses for the further checking of seedling growth in the main field. Hardening can be done by two methods. The first method is spraying of the seedlings with little amount of salt as it prevents more water and nutrient uptake and the second method is the seedlings should be exposed to sun for a brief period of time during the morning hours and the exposure and light intensity should be increased gradually (Pandiyaraj *et al.*, 2017). Some other methods are holding irrigation and nutrients application.

Transplanting

Seedlings will be ready for transplanting when they are in 2 to 4 leaf stage or 21 to 30 days old depending upon the crop. When the seedlings were taken out from the protray, a fine mesh of roots can be seen holding around the media. Transplanting can be done in morning or evening hours on normal sunny days. When the temperature is very high, it can be done during evening hours.

Advantages

1. Excessive loss of seeds should be avoided and there is less wastage of seeds which are commercially very high.
2. Nursery raising will ensures time for the main field preparation
3. There is a less chance of occurrence of pests and diseases.
4. Soil borne diseases could be prevented due to the use of sterilized media in the portray preparation and treating the seeds with recommended fungicides.
5. Minimum seedling mortality.
6. Uniform establishment of seedlings.
7. Damage to the roots can be prevented as in nursery beds.
8. Irrigation and fertilizer use efficiency is more.
9. Costly hybrid seedlings can be raised in this method.

Limitations

1. Trained and skilled labours are needed.
2. Certain amount of pre-knowledge is required.
3. Care should be taken during from selection of protrays to hardening.
4. Pests and disease incidence.

Conclusion

Vegetable seedling production has become a widely commercialised sector, with the majority of farmers purchasing seedlings from professional producers and protray raising getting popularised now a days due to the production of healthy plants free from pests and diseases. Many variables contribute to the production of high-quality seedlings this include using high-quality seeds, growth medium with appropriate drainage and water retention capacity, and ensuring ideal fertility rates (Pandiyaraj *et al.*, 2017). Vegetable nursery raising

provides an ample amount of jobs to unemployed people and it will become a hobby to the uneducated rural women, if they are trained well. There is a great scope for this market and many more commercial crops, particularly those with high economic value and potentially high seed cost, may be cultivated as seedling transplants in the future.

References

- Bharathi, C.S., Mohan, B., and Alagudurai, S. (2014). Raising of hybrid vegetable seedlings under protrays. *Journal of Krishi Vigyan*, 2(2): 64-68.
- Pandiyaraj, P., Kumar, Y.R., Vijayakumar, S., and Das, A. (2017). Modern nursery raising systems in vegetables. *International Journal of Agriculture Sciences*, 9(52): 4889-4892.
- Reddy, K.S. (2019). Bighaat. Raising seedlings in nurseries. <https://www.bighaat.com/blogs/kb/raising-seedlings-in-nurseries>. Accessed on 16 January 2023.