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Soilless Plug Nursery Seedling: A Boon for Farmers

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Abstract

Inadequate availability of quality seeds and planting materials is one of the major limiting factors affecting productivity, profitability and quality of vegetables in the India. Higher profits can be accrued by the farmers, if they have better access to high quality seed and planting materials of the improved varieties at reasonable costs close to their production sites.

At present only up to 30-40% demand for planting material is being met by the existing registered nurseries; the rest are met from the unorganized sectors, implying the need for establishing more modern nurseries in the organized sector. Since nursery seedlings is the backbone for successful crop production as such the technologies which guarantee healthy seedlings are being taken up nationally and internationally.

The Plug Type Nursery Seedling and women farmers in training in Institute of Horticulture Technology, Greater Noida.

The most popular technological intervention has been the production of plug type nursery seedlings in soilless medium under protected conditions. Although fully or semi-automated models are available yet at grassroots the use of Soilless Plug Type Seedlings Production in protected conditions without any automation can still be highly useful in rural areas at Panchayat level. With this intervention the development of seedlings in nursery house not only reduces the time fields remain occupied with crop,

but it also increases the uniformity of the crop and resultant produce. Furthermore, every high value seed is taken care in the nursery house in portrays and hundred percent germination and vigorous seedlings are assured. There is effective utilization of unfavourable period by preparing nursery under protected conditions. Seed cost of some crops like hybrid vegetables, ornamental plants, spices and some fruits can be economized through nursery sowing.

Women Empowerment

Nursery seedling production is a delicate job as every seed has to be dealt individually while sowing in protrays and care there off, women by nature being mostly patient as such are typically more suited for Soilless Plug Nursery Seedling Production in Protected Conditions as it requires patience. With bottom up approach the women groups at Panchayat level are very important link which should be organised for organised soilless nursery seedling production targeting the land under vegetables in each Panchayat.

Why Plug Nursery?

A plug plant is a seedling, grown in the cell of protrays, a protray mostly contains 98 cells. The seedlings at the time of transplant are taken out from the portray cells along with growing media in the shape of a 'Plug' and are directly transplanted in the field at required plant to plant and line spacing recommended for each vegetable or variety. The protrays can be directly taken to the field manually or in tractor/ trolly thereby limiting the chances of seedling mortality. The other advantages being the costly seeds of high value crops or hybrids in protrays ensure germination of each seed, efficient use of nutrients and the management of insect pests, diseases, viruses is more effective under the protected conditions in soilless medium in portrays. Protrays are of different sizes may vary from 20 to 512, they are generally biodegradable as such environment friendly.

Protected Structures and Plug Seedlings

The production of good quality seedlings is essential for getting higher yields and improving crop quality. Previously farmers themselves produced the seedlings required for transplanting at a lower cost, as most of the vegetable varieties were open pollinated types. Now, most of the farmers are using high yielding F1 hybrids to augment productivity and these hybrid seeds are expensive so getting every individual seed into a healthy seedling becomes essential and this requires proper nursery management which is more possible in the Plug Nursery Seedling production using soilless medium in protected conditions.

In polyhouse with climate control system permanent portrays are fitted on benches and numbers of protrays may vary as per the capacity. The nursery polyhouses may be provided with automated irrigation and fertigation system conducted with boomers via fine mist. Humidity being a critical factor in a nursery greenhouse, sensors may be used to trigger the onset of irrigation boom. In 100 m2 polyhouse about 39000 seedlings are produced in one cycle of 15-20 days, so a 500m2 polyhouse will produce 1.95 Lakh seedling in one cycle such 15-20 cycles can be taken in a year.

The soilless rooting media is light and porous which retains moisture and allows proper drainage. The inert media used for raising nursery is sterilized to ensure the disease-free status of the seedlings. It is free from weed seeds and any soil borne pathogens or insects. Different types of media combination for plug trays are used, the most commonly used media in India is Cocopeat: Vermiculite: Perlite (3:1:1),

Small seeded, transplant vegetables such as tomato, brinjal, Chillies, capsicum, cauliflower, cabbage, broccoli, brussels sprouts, lettuce, knol-khol as well as large seeded generally direct sown vegetables such

as cucumber, gourds, pumpkin, beans, beats and others can be grown in plug trays.
Similarly seedlings of winter and summer annual flowers like marigold, pansy, Antirrhinums, cornflower, China Easter, Zeina, Sylvia, California poppy, celosia, petunia, ornamental chilli/Cabbage and Sun flower etc. can be raised in the soilless media with this technology. The Stem cuttings of carnation, coleus, dahlia, chrysanthemum, fuchsia, geranium, petunia, impatiens, rose etc. and the suckers of chrysanthemum and gerbera etc., also are successfully raised in the soilless medium. The most liked gladiolus corms, dahlia and lilium bulbs can also be raised with the use of this technology.
Demand for QPM seedlings of vegetables, fruits, ornamentals, forest and trees outside forests (TOFs) species is increasing over the years. Ease of availability of quality planting material (QPM) at reasonable costs, however, is a challenge. At present only up to 30-40% demand for planting material is being met by the existing registered nurseries; the rest are met from the unorganized sectors, implying the need for establishing more nurseries in the organized sector.

Participatory Approach

There is need to have participatory approach which is aimed for enhancing the overall agricultural productivity, livelihood improvement and socioeconomic enhancement of people. The implementation of soilless nursery technology in participatory mode (consortia of persons from private organizations and public) has potential to provide win-win situation to its stakeholders.
In such participatory approach for production of vegetable seedling without soil n protected conditions will be in good demand; because they the local group of the farmers will show interest to develop their more desired/preferred species only. There will be qualitative and quantitative increase in the yield of the crops in turn increases the societal awareness and improves the socio-economic status of stakeholders due to its assured employment and profit.
Such programmes if planned meticulously will motivates the women participants in developmental activity and empowers them with the additional employment and livelihood opportunity during lean agricultural operation period. It assures win-win situation to its stakeholders
Such a programme needs initially government support with respect of the protected structures and the initial financial support for the inputs for the first 2-3 cycles of the seedling production. The participating group will initially need training for undertaking such activities. After successful completion of 2-3 cycles of seedling production the self-help group will start getting returns from the sale of the seedlings in their area and plan the further targets for the seedling production in the area.
Institute of Horticulture Technology provides trainings to the farmers, filed functionaries and other interested bio entrepreneurs in the production of Plug Nursery Seedling Production in Soilless medium in the world class facilities in its main campus at Greater Noida, Uttar Pradesh, NE Centre in Mandira, Assam and at the block/district/state level for popularization of the technology in the rural areas.

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