



Innovative Technique of Hydroponics for Rapid Nursery Raising in Paddy

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Introduction

Ayurved Research Foundation with support of NABARD worked out an innovative farming technique by raising paddy nursery under hydroponic condition. Ayurved progreen hydroponic machine is engineered to produce luscious green feed and fodder for livestock and human being. It uses natural light in place of artificial light so “Pro Green” name was given. This technology requires no soil and conserves 95% of the land & water. Basically machine fulfills the physiological requirement of plants without the use of soil. This machine have the facility to maintain the temperature and humidity so as to produce the greens/ nursery in all weather and season in spite of relying on natural weather while nutrition is provided by water soluble minerals solution, crops can also be taken under late and odd season also. The water required for producing various crops through this hydroponics machine is less than the quantity of water required in conventional method as this machine totally uses recycled water supply so that no wastage of water during irrigation process. To maintain an internal temperature between 15° C - 32° C, refrigeration system has been provided. This technology has a high potential in India due to water crisis and shrinking arable land. This Ayurved progreen hydroponic machine can be used to grow various crops eg. green fodder, nursery for field crops, wheat grass, sprouts, micro green, nursery of medicinal plants, vegetables, horticultural and floricultural crops of high commercial value. Here taking a case study of Paddy nursery produced in Ayurved progreen hydroponic machine growing at temperature of 32° C with 70-80% humidity. It requires very little amount of water and land against conventional system and also the nursery was prepared just in 7 days whether the conventionally this growth requires about 28 days so fast and most economical nursery production is observed under Ayurved progreen hydroponic machine forming best mode of nursery germination.

Paddy Nursery Production under Conventional Method

Previously most of the farmers from Sonapat and Panipat district (Haryana) were following conventional method for paddy (PB-1121) nursery, but they observed higher mortality up to 35% to 40 % of seeds during nursery raising and transplanting, the water used for raising nursery for

an acre land under conventional method was very higher up to 1200 liters, the fertilizer requirement was higher, required continuous weeding and the crop nursery also affected by pH, salinity and different external stress conditions. The disease and pest infection was also found affecting the germination percentage in nursery resulting in reduction in yield after transplanting.

Ayurvet Progreen Hydroponics Machine Raised Nursery

During Kharif season of 2015, Ayurvet Research Foundation with support of NABARD had conducted trial on 35 Farmer's field of Sonipat district. The Ayurvet progreen hydroponic machine raised seven days old hydroponic paddy nursery was transplanted manually in different villages of Sonipat District of Haryana. The observed variation was favorable to farmers welfare as the hydroponically raised nursery was transplanted just after seven days of germination and performance was very much effective over conventional method. The mortality during nursery raising and transplanting was about negligible (5-7%) and the chance of infestation through disease and pest was not observed during nursery raising and the yield parameters like the average number of tillers observed was 30-35 under hydroponic system but it was 20-22 in conventional system, the average number of grains per panicle was 100 but its about 93 in conventional method and the average total yield observed under hydroponic system was about 2325 kg per acre but in case of conventional system it was about 2000 kg per acre (Picture 1).



7 days Paddy nursery in Hydroponics Paddy nursery ready to Transplant

Comparative Performance of Hydroponic Technique with Conventionally Raised Paddy Seedling

According to the benefited farmers of Sonipat, the raising nursery under conventional method took 28 days process while the same stage of nursery was raised in just 7 days under hydroponic system, saving 21 days so paddy cultivation was easy under late sowing condition. Seeds requirement was low (up to 40%) in hydroponic technique (low mortality found). The enormous labor for field management practices were needed in case of conventional method because continuous weeding was needed in conventional method of nursery raising but weed management was not needed for hydroponic system, no need of maintaining seed bed for nursery raising in hydroponic system while it was needed in case of conventional technique, the seed mortality was negligible with hydroponic technique. It also sustained water use because of recycling of water technique. Hydroponic technique was most efficient method at nursery raising

stage by saving the total input cost up to 10,000 rupees on labour and field management practices and early harvesting provides good availability of market at demanding prices with difference up to 250 to 300 rupees per quintal with low competition.

Other Benefits

This technique is most efficient for early nursery raising as it is time saving i.e., nursery raised just in 7 days (saving up to 21 days), no infestation chances at nursery stage and up to 95 % water saving. Low input with higher yield and early harvesting creates greater opportunity to market (Picture 2).



Technique Implementation and Extension

Earlier Ayurved Research Foundation had implemented this technique with support of NABARD, by involving 35 farmers of Sonipat district and now Ayurved Research Foundation is planning to implement this technique up to number of farmers by extending this technique through SHGs and Kisan Club.