

Hi-tech seed production system revolutionizing the seed potato industry in India
ICAR-Central Potato Research Institute, Shimla-171001(HP)

Availability of quality planting material has always been a limitation in vegetatively propagated crops. Potato, largely being a vegetatively propagated crop, is subjected to large number of seed-borne diseases responsible for yield degeneration. Hence, it is imperative to use good quality healthy seed for sustainable and economic production of potato. The conventional seed production technology based on “seed plot technique” is successfully being used in India since last five decades for quality potato seed production. It comprises of tuber indexing for all major viruses and clonal multiplication of virus free mother tubers in four cycles for breeder seed production. The breeder seed produced by ICAR-CPRI is supplied to various State Government Organizations for further multiplication in three more cycles, viz. Foundation Seed 1 (FS-1), Foundation Seed 2 (FS-2) and Certified Seed (CS) under strict health standards. However, the current status of breeder seed multiplication by the State Governments is not as per the desired seed multiplication chain and breeder seed supplied by ICAR-CPRI is often being multiplied only up to FS-1 stage. As a consequence there is a huge shortage of certified seed in the country. Incorporation of hi-tech seed production system coupled with advance virus detection techniques is the only way out in fulfilling the huge demand of quality seed potatoes in the country.



Source: Seed Technology Division, ICAR-CPRI, Shimla-171001(HP)

Keeping that in view, ICAR-CPRI, Shimla has standardized a number of high-tech seed production systems based on tissue culture and micropropagation technologies. Adoption of those systems of seed production will improve the quality of breeder seed, enhance seed multiplication rate and reduce field exposure of seed crop by at least 2 years. The systems were thoroughly tested at seed production farm of ICAR-CPRI before passing them on to farmers and other stakeholders. Adoption of high-tech seed production systems developed by the institute has led to opening of more than 20 tissue culture production units throughout the country. Several Government/Private seed producing organizations procure virus-free *in vitro* mother cultures of important notified and released potato varieties every year from ICAR-CPRI, Shimla for further multiplication in their high-tech seed production programmes.

The latest hi-tech seed production system standardized by the institute is based on the concept of soil-less, aeroponic technology. The aeroponic system of seed production has the potential to once again revolutionize potato seed sector after about 50 years of introduction of “seed plot technique” by the institute. The aeroponic system has been perfected in the year 2011 and so far it has been commercialized to 14 firms from different states like Uttar Pradesh, West Bengal, Punjab and Haryana. Each firm is licensed to produce 10 lakh minitubers by aeroponic system. Even if each firm is operating at half of its potential, about 6.5 million minitubers are currently being produced by those firms.

ICAR-CPRI produces ~ 3,187 metric tonnes of nucleus and breeder seed of 25 popular potato varieties; out of which 70% is through conventional system whereas, 30% through high-tech systems. As there is limited scope to increase quantity of breeder seed production at ICAR-CPRI farms due to limitation of farm land, possibilities are being explored with the help of SAUs/KVKs/Pvt. farmers to identify the new areas of seed production, multiplication of breeder seed into FS-I, FS-II and Certified Seed under MoU and to produce seed through hi-tech systems with the help of entrepreneurs/private companies.