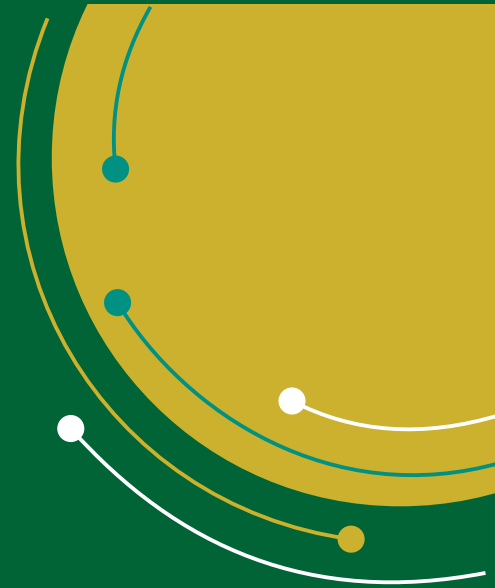
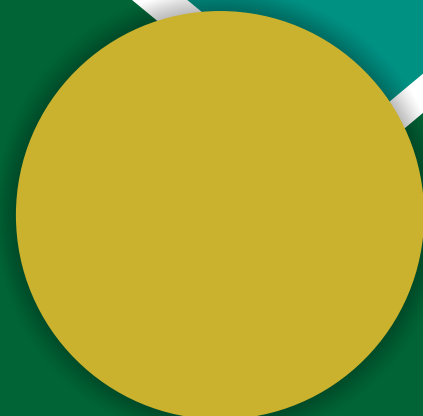


Sanitized Citrus Nursery



Muhammad Jafar Jaskani

Institute of Horticultural Sciences,
University of Agriculture, Faisalabad



Citrus is adversely affected by a number of virus diseases, many of which can be transmitted during budding/grafting and as a result the citrus groves have low productivity and longevity. In Pakistan the current nursery methods of citrus fruits are primitive and less efficient. A bad nursery plant could have inherent genetic defects or be a carrier of diseases. The genetic defects occur due to excessive load of somatic mutations and diseases (infected budwood or soil borne). Among all

of the fruit crops, citrus stands alone in the number of graft transmissible diseases, which are propagated by infected budwood. As a result, most orchards are short lived and produce only a fraction of potential yields.

The world's best fruit growing countries have self sustaining nursery certification programs implemented by government agencies and backed by R&D institutions. A certification program ensures supply of healthy and true-to-type nursery plants to the growers. Under such nursery production systems the orchards have long productive life, high yields and quality fruits.

Scope and Significance

Low production and orchard life can be attributed to many reasons; among them diseased/infected budwood is one of the basic reasons. Soil born diseases are the other cause of citrus orchards decline. In Pakistan current practice of citrus propagation is being carried out by traditional ways which are vulnerable to various diseases, causing monetary losses to the growers. It also hurt the export of citrus fruit.

Taking the challenges, UAF has developed a very efficient mechanism of developing a citrus disease free budwood and container grown citrus plants. This is a program to establish citrus nursery on scientific standards and focus to develop citrus budwood (required to grow a complete citrus plant) free from diseases. This is the first nursery of its kind with current capacity of 50,000 plants annually whereas demand for new citrus plants in our country is around 4 million. Major objectives of this program are 1) to establish a foundation block of disease-free trees of commercial varieties of citrus, 2) to maintain a rigorous program of testing and retesting of foundation trees to assure continued freedom from disease, 3) to evaluate the horticultural characteristics of foundation trees to assure trueness-to-type, 4) to develop and maintain container grown citrus rootstock seedlings and propagate disease free citrus nursery plants for sale.

This technology has already been commercialized and ten such nursery systems have been established in private sector in collaboration with Agri-business Support Fund and UAF helped the investors to establish modern citrus nurseries. If all citrus plantations have been carried out through these nurseries then there will be revolution of healthy citrus groves.

Essential Features of Sanitized Nursery Program

The essential features of certification program include:

- A laboratory base for tissue culture and diagnosis of diseases;
- Greenhouse and screen house for propagation and quarantine work;
- Field plantations of foundation trees of rootstock and scion varieties;
- Logistic support; and marketing.

Anticipated Benefits

The citrus budwood from scientifically established nurseries can yield following benefits:

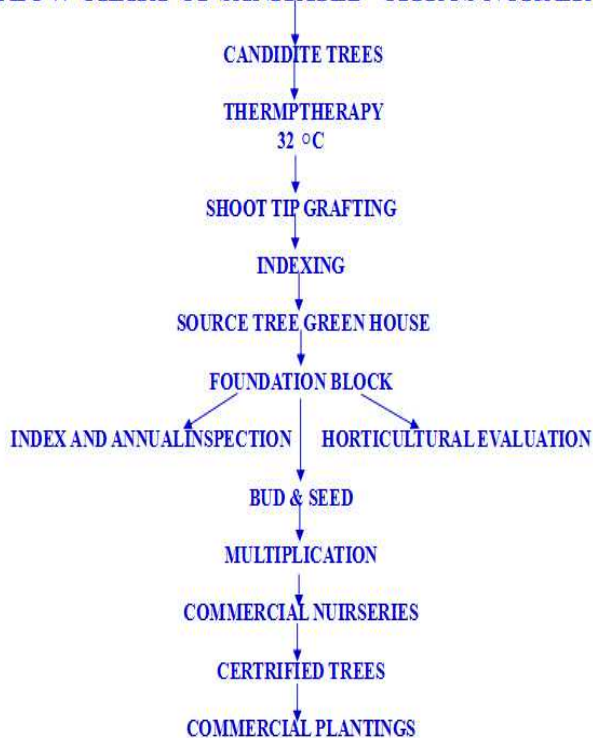
- Disease free citrus budwood and plants
- Longer life span of groves
- Higher productivity and quality fruits
- Nursery production and management business

Expected Market

Annually eliminated/replaced citrus plants with 5.5% increase	2.83 million
Average new plantation per year	5000 hectares
Annual demand of plants for new plantations	1.25 million
Total number of plants needed annually	4.08 million
Number of nurseries needed to furnish the demand	80 (50000 plants capacity)

Institute of Horticultural Sciences has the capacity to provide "Consultancy Services" to the investors in establishing sanitized citrus nurseries as has been modeled at UAF campus.

FLOW CHART OF SANITATED CITRUS NURSERY



In vitro micrografting and microbudding for virus free plants propagation



Disease free foundation citrus trees for budwood multiplication