

Mango Research Interventions for the successful postharvest value chains in Sudan

by:

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INTRODUCTION

Mango production in Sudan is practiced for a long time. Areas under mango cultivation is increased from 27.5 thousand hectare in 2003 to 29.9 thousand hectare in 2013. Accordingly, production is increased from 602 thousand tons in 2003 to 641 thousand tons in 2013.



Introduction - continued

Main production seasons all year round, except September-October. Season of export is from December to August. The dominant variety in Sudan is Kitchener which called Baladi and represents 90 percent of the total cultivated mango.

Cultivation is entirely on the fertile silt loamy soils irrigated by rivers or underground water using surface irrigation.



Different cultivars of mango in Sudan

Twenty four mono-embryonic and seven poly-embryonic Indian cultivars are commonly available in Sudan. Other mango varieties were introduced from South Africa and evaluated recently including Tomy Atkins, keitt, Kent and sensation. The existing plantings of these introduced varieties have shown that these can be grown and adopted by farmers successfully and provide a starting point for expansion and export.

Research interventions-1

- Nursery management to improve mango root stock seedling vigor for propagation
- Nursery management to improve mango propagated seedling vigor for field planting

The Mango Propagation

- Mango Propagation: (Rootstock/scion combination)
- Selected poly-embryonic mango seeds for propagation should be freshly extracted from clean ripe fruit to insure faster germination rates.
- It is important to select seeds from trees that appear to have a low incidence of pests and disease in order to reduce the potential contamination of seedlings.
- Seed germination will be more efficient if the embryos are removed from the endocarp.



Rootstock in the nursery

- Healthy seeds should germinate within two weeks of planting.
- Germinating seeds should be protected from full sunlight by growing in 50–80% shade and the potting media must be kept moist by regular irrigation.



Vegetative propagation methods on mango

The “cleft” and “whip-and-tongue” methods are among the most applied propagation techniques in Sudan



Grafting

The most common age for grafting trees in the nursery is between six months and two years.

Mango rootstocks and scions can be joined using many grafting and budding techniques



After the scion buds shoot, apical growth of the mango seedling is established and the growth of auxiliary shoots on the rootstock is suppressed.



Grafting for mango propagation

Grafted trees should be separated sufficiently to allow adequate air flow and light penetration in order to lower the relative humidity and prevent the microclimatic conditions preferred by pests and diseases.

Research interventions-2

- Effect of agronomical packages and irrigation regime on mango tree performance



Mango Planting

Grafted trees should be planted at a depth that keeps the graft union about 10–15 cm above ground level. Trees should be watered immediately after transplanting to compact the soil around the roots and to reduce water stress. The new plantations are irrigated by modern systems. Protection from wind by local barrier is required.

Research interventions-3

- Effect of close space planting and pruning timing on mango tree performance



Mango Orchard Management

The advantages of more densely planted mango orchards are increased canopy and productivity per unit area, and allow more efficient management operations. higher density requires more skilled management to maintain productivity and fruit quality.

In Sudan higher density planting is still limited practice under research evaluation.



Fruit harvesting

Harvesting of mature fruits should be carefully done specially with high tree canopy to avoid skin (peel) injuries. After picking off the fruit, harvested fruits should be kept under shade for primary sorting and before packing in carton boxes.

Research interventions-4

- Comparative study on cold storage for mango shelf life and fruit quality traits.

Evaluation of cold storage and ripening

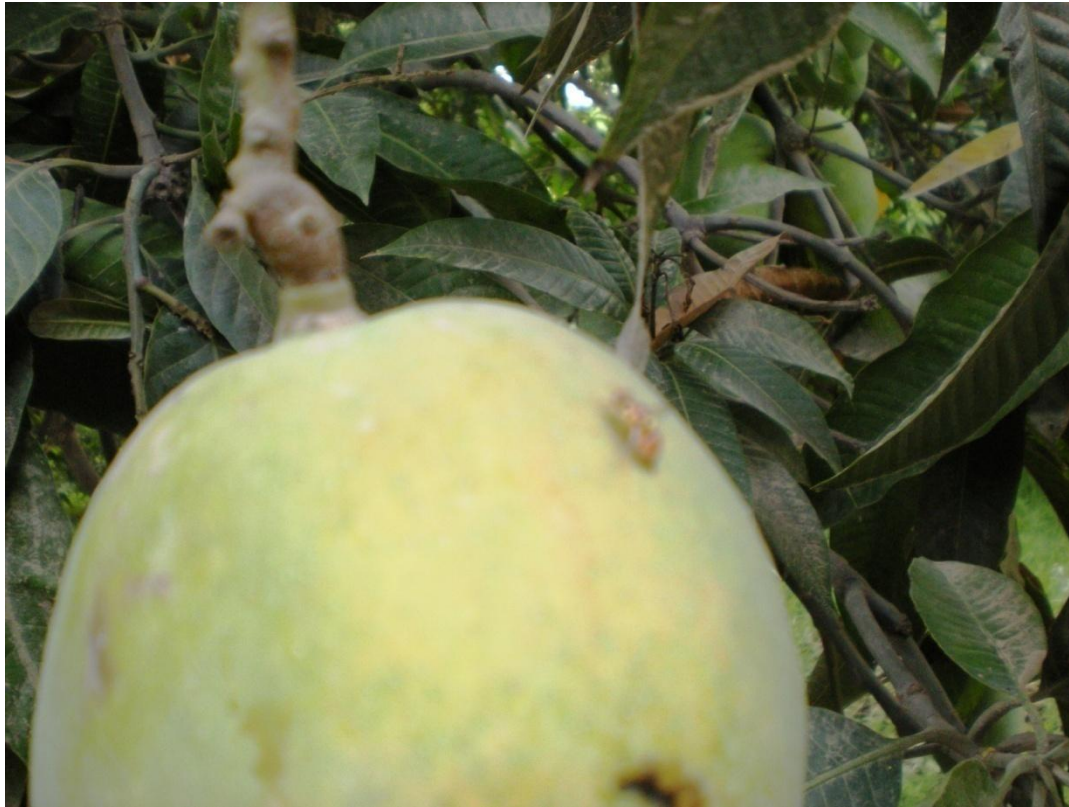






Research interventions-5

- Evaluation study on the effect of vapor heat treatment to eliminate fruit fly infection



Fruit fly infestation

Fruit flies are known worldwide as destructive pests of mango fruits. Thus the importing countries where such fruit flies do not occur are exercising every effort to prevent the entry of such pests by stringent phytosanitary measures. Vapor heat treatment (VHT) is now applying in Sudan as a quarantine safeguard to prevent spreading of fruit flies.

Sudanese Center for sterilization of horticultural crops using VHT





Vapor heat treatment chamber

Boiler Unit made from stainless steel - Capacity 2000/L of water - Providing vapor heat for 20 tons of fruit - Water Tank (3000-4000/L) - Fuel Tank (1000/L) - Water Filtration Unit with 4 phases – One electric motor with high pressure 90 m. Two control electronic units with 7 digital sensor screen - Laptop computer with color printer. Two rooms (containers) with inside stainless steel. Five sensors for temperature plus one sensor for relative humidity in each room

A fruit treated by Vapor heat



Treated fruits before packing



Fruit preparation hall



Sorting and packaging



Good quality treated fruits



2014 04 21



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Sticking the brand



Treated fruits ready for export



Carton covered with pellucid cloth



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Consignment ready for export



**Thank you for your
attention**