Welcome

Mumtaz Agriculture Farm Multan Pakistan

kinnow(mandarin) web page

Kinnow.PDF

Mango&Kinnow Trees  Kinnow the Easy Peelers

Located by the side of the World-Famous Oldest living city (Multan)
Mandarin (Kinnow)-Growing Region of Pakistan!

My kinnow Farm is about 20 miles east of Multan near to lahore /multan high way .

Mumtaz Agriculture Farm landscape is to enjoy Kinnow (Mandarin)&Mango trees dark, evergreen foliage, fragrant blossoms and colorful and delicious fruit.

Name: KINNOW . Generaspeice: Citrus reticulata Blanco. Synonyms: Kinnow.Tangerine
This variety is the result of a crossing whose relative female was Citrus nobilis Lour. ' King ', the male relative was Citrus deliciosa Ten. ' Willow leaf'. It was prospected by Howard B Frost working for ' California Citrus Exp. Sta.' in 1925.
Note: Kinnow = KINg X willow leaf.
Vitamin A=3% ,Vitamin C 130%,Calcium ,4%,Phosphorous=3% ,Iron=4%
Pakistan as a nation produces about 8 per cent of the world's citrus fruits

top

Hybrids Name (Citrus reticulata Blanco paradisi Macf.) Super Oranges Pakistani mandarins (Kinnow)All citrus trees require deep soil having both good surface and internal drainage. Most Kinnow grows well in a soil pH range from 6 to 8. Avoid soils that have a excessively salty, as citrus trees will not grow well in such soils. Growth and production of citrus under other trees (mango) is not entirely satisfactory. Citrus requires full sunlight for optimum growth and production. As we have mango and kinnow mix trees we have problems with pruning and tree size control. Sour orange, the most

common root stock . In Multan . T-budded onto a seedling rootstock several inches above the soil line. The rootstock of a budded tree includes all roots and the lower few inches of the trunk. Best results come from planting during **early autumn, the tree can establish before the onset of cold winter temperatures.** After planting field water them regularly till new growth. Do not apply fertilizer until the tree begins new growth after planting. Fertilize monthly through October. Scatter fertilizer on the ground at least a foot from the tree trunk and promptly water it in thoroughly. Good weed control is essential for rapid establishment and vigorous growth of young citrus trees. Eliminate all existing weeds for several feet around the tree. As the spread of the tree increases, widen the grass-free area beyond the tree canopy or drip-line. Weed control can be accomplished by mechanical means such as hoeing. Organic mulches are not recommended for citrus trees because of the potential for inducing foot rot disease. If mulches are used, keep at least 12 inches of bare ground between the tree trunk and the mulch .Herbicides such as Roundup (TM) and Kleenup (TM) are excellent for control of existing weeds and pre-emergent herbicides may be used to prevent weed .We use Hoeing & Roundup.

Care of Established Kinnow Trees

To maintain good growth and vigor to maximize the production of quality fruit. 1. irrigation,2.fertilization and weed and grass control.3.Pruning 4. Pest control is necessary to produce bright, clean fruit, and to maintain tree health and vigor. Flood irrigation should be avoided. Flood irrigation is the usual method of irrigation on my farm. which consumes irrigation water nearly double of what drip irrigation consumes. On yearly basis a minimum of 50% saving of irrigation water can be done by drip irrigation. Farmyard manure must be well rotted before it is applied onto your soil. It is possible to over manure, so use little often rather than a lot at one time of the year. Air and water are needed to break down the plant material. During this process heat is produced which will destroy weeds and disease spores. In a very wet season cover the heap or composter with polythene to prevent the materials getting waterlogged. The fertilizer may be applied at two time for the year, First in February 2/3.Secend in august 1/3. Air temperatures below -2'C can damage citrus if soil conditions are dry.Temperatures over 37'C, although citrus can tolerate very high temperatures for short periods of time without any permanent damage. the maximum temperature exceeds 45'C for a few days without economic damage to trees. application is to spread the fertilizer uniformly on the soil surface under the tree canopy and slightly beyond and water it in thoroughly. Control weeds and grass beneath citrus trees to reduce competition for fertilizer and water. Also, weeds and grass may harbor pests which can affect the fruit or trees.Excessive bearing in some orchards leading to decline.

Kinnow trees are pruned primarily to control tree size and to remove dead, diseased or damaged wood. Monitor and control outbreaks of pests or diseases which affect tree vigor, as reduced vigor results in reduced production. Aphids, mites, scales and whiteflies . Citrus trees are pruned in order to allow air circulation and access under trees (skirt pruning), to remove or shorten water shoots to prevent them from becoming too dominant, to allow light penetration into the canopy and to prevent crowding of main scaffold branches , to remove branches which cross. and to increase fruit size and to prevent fruit damage due to limb rubbing. Avoid over pruning. The leaves are the

manufacturing part of the plant - removing too much of the canopy will reduce tree growth and crops. Citrus bark burns easily if over exposed to the sun. Typical Kinnow trees go through three periods of fruit drop. First is the drop of about 60 to 70 percent of the flowers during and immediately following bloom. The second drop occurs a couple of weeks later, involving small fruit of pea-size to marble-size. The third drop occurs in late August , A few fruit on Kinnow will continue to drop through final harvest, but that is normal and cannot be prevented. Kinnow fruits generally store well on the tree; some fruit drop does occur but usually is compensated by increased size of the remaining fruit. Kinnow should be harvested during their season December to March. In Multan at my Farm, Kinnow bloom in February March. reach maturity in December-February and goes up to end of April . using ladders .The pickers dump the fruit at one place then graded and load on to large open pickups for marketing . we are committed to supplying the most progressive and demanding markets in Pakistan with quality fruit grown to our standards of excellence, emphasizing superior taste and food safety. Kinnow prevent cancer, heart disease, and birth defects as well as contribute to a balanced and healthy life style .An excellent source of Vitamin C ,Cholesterol Free, An excellent source of fiber, A source of folate, Fat Free ,Sodium Free .Enjoy a Fresh Kinnow today.

FertilizerThe whole Kinnow fruit contained 0.24% N, 0.027% P and 0.197% K. The one ton Kinnow fruit is estimated to remove 0.24 kg N, 0.27 kg P and 1.97 kg K from the soil annually which works out to be 96.0 kg of N, 10.8 kg of P and 78.8 kg of N ha^{-1} as a yield of 40 tons ha^{-1} is common.fruit contained 0.071% N, 0.017% P and 0.015% K on fresh weight basis. The pruning wood of ber had 0.014% N, 0.08% P and 0.28% K. Annual removal by fruit is estimated to be 25.56 kg N, 6.12 kg P and 54.00 kg of K ha^{-1} and by pruning wood 14.36 kg N, 8.21 kg P and 28.73 kg K ha^{-1} annually by an orchard yielding 36 ton ha^{-1} fruit and 10.26 ton ha^{-1} pruned wood.

Tree require, from a nutritional stand point, a well balanced diet applied in the right proportions at susceptible to diseases and insect attacks and will become sick and possibly die prematurely. Unhealthy weaker plants with low BRIX (sugar) readings are more prone to disease and insect attacks than that of healthy plants. Low grade NPK fertilizer application

can weaken a plants immune system resulting in a lower survival rate during stressful conditions, such as abnormal climatic and/or temperature conditions, during trans planting and Once your plants have produced fruit and that fruit has formed and begins to grow or mature. High POTASH with a high PHOSPHORUS is needed with just the right combination of maximum economic yield, which gives the best return for applied fertilizer. The application rate of fertilizers for Kinnow trees varies according to the age of the tree, the fruit yield, the soil fertility and the nutrient status of the tree. Time of fertilizer application/organic manure is after harvest is to restore tree vigor .About 50% of the total annual chemical fertilizer is used. Organic straw or livestock manure 30kg to 60kg/tree with fruit load of 600kg.Also npk=600-300-450.2nd application in July then September .Some farmer use 1 to 1.5 lbs of actual N/Year

(1kg to 2kg urea46%). .On clay loam 50 g per tree of boric acid .Use fungicides contain

zinc and manganese. Nitrogen deficiency symptoms are a reduction in yield, and yellow or pale green leaves. Leaves drop off earlier than usual. Potassium deficiency is small fruit which have low levels of sugar and acidity.

nitrogen to allow a good balance. This will help build quality in your crop . Young trees 1to3 year gr/tree/year .75-.75-.75.Fruit yield .6ookg = 600-300-450. 900kg=800-400-600. 120kg=1000-500-750.

WATER FOR KINNOW perennial horticultural crops , input intensive and cultivated under irrigated conditions therefore, irrigation is one of the most important criteria for successful regular, quality production fruit A number of technologies have been developed to minimize the impact of water stress up to some extent .In general, mature citrus require 900-1200 mm of water per year, either as rain or as a combination of rain and irrigation.

Weed management :Weed reduce crop production and contributing future problems through weed seed production. Round up is best to apply when weeds are less then 6 inches tall but rounup can be applied long after critical application time and still give good weed control (result on my farm). Plant basins should be covered with mulches preferably grass mulch (10 -15 kg/basin) and It helps in conserving the soil moisture, reducing the weed intensity by 60% in grass mulch and 100% in polyethylene mulch also reduce the cost of cultivation. black polyethylene mulch (100 micron) throughout the growth period. The polyethylene mulch maintained 29% more soil moisture compared to un mulch trees. Young Hasta flush should be sprayed against insect pests and diseases .Bordeaux mixture (paste) should be applied on the tree trunk immediately after the withdrawl of monsoon kinnow growers to visit their fields regularly at the time of new growth during March and observe the population build up and act at correct stage. He also commented upon the control of footrot and fruit drop, two other serious underside of the leaves.

Chemical Control of Whiteflies: Primarily attack new growth .infests the underside of the leaves sooty mold fungus , which in turn grows in the honey-dew excreted by the immature stages of the whitefly. Chemical control of whiteflies is both expensive and increasingly difficult. If the rate of whitefly re-infestation is great enough, the cost of effective insecticide treatments may be prohibitive. Besides the cost of treatment, other factors involved in chemical control decisions are the need for thorough coverage ,the risk of secondary pest outbreaks , the risk of whiteflies developing insecticide resistance, and the regulatory restrictions on the use of insecticides. These factors have to be weighed against the expected returns for a given crop at a given planting date. Many systemic and contact insecticides have been tested for control of whiteflies, but few give effective control. Currently registered systemic insecticides, such as oxamyl, have been only partially effective. Certain contact insecticide combinations, especially pyrethroids such as fenpropathrin or bifenthrin plus organo-phosphates such as acephate or metamidophos, have provided excellent control in greenhouse and field studies as long as there was thorough coverage of the foliage. However, by exposing pest populations to two types of chemicals at once, combinations may accelerate selection for resistance to both materials .Therefore, tank mixes should be resorted to only when single applications are not effective. Other products with

contact activity, such as oils, soaps and K-salts of fatty acids, can be very effective with thorough coverage, but in field tests they are often less effective because of poor coverage. Good coverage of the foliage with contact insecticides is essential for best results. Most whiteflies are located on the undersides of leaves where they are protected from overtop applications, and the immature stages (except for the crawle) are immobile and do not increase their exposure to insecticides by moving around the plant. Used rop nozzles where appropriate, adequate pressure, and calibrate and maintain equipment carefully. Specific insecticides should be selected according to the stage (s) of whitefly to be controlled. For example, growth regulators often control immature stages by affecting nymphal development, but do not provide good adult control. On the other hand, short residual contact insecticides may control adults, but not affect egg hatch. Whiteflies have become resistant to insecticides threatening the success of traditional chemical control techniques in other areas .The effectiveness of the insecticides could be lost if the excessively and repeatedly applied .There are techniques for monitoring resistance to determine which insecticides are still active against whiteflies. Generally, if an insecticide treatment is properly made with sufficient coverage and yet is ineffective, then that whitefly population should be tested for resistance to the product.There is a possibility that treating a resistant whitefly population with certain insecticides could actually accelerate population growth. This could be because more eggs are laid when the insect is under biochemical stress ,orbe cause beneficial arthropods are eliminated. To minimize this potential problem ,insecticide applications should be used judiciously and combined with non-chemical control tactics. Furthermore, distinct classes of chemical compounds should be rotated at least every other spray. Distinct classes of insecticide include the pyrethroids (Ambush, Asana, Danitol, Karate, etc.), organo-phosphates (Orthene, Monitor, Lorsban) ,carbamates (Vydate) ,chlorinated hydrocarbons (Thiodan), insect growth regulators (Applaud, fenoxicarb), oils, and soaps and detergents. Resistance to soaps and oils is unlikely to ever develop, so these materials should be used as much as possible. The insecticides mentioned in this section may not be recommend on labels for use in your area or for your crop. Read the insecticide label before applying any insecticide.

Natural Control of Whitefly

Whiteflies are controlled by predatory insects such as green lacewing or coccinelid larvae; by parasitic wasps such as Encarsia or Eretmocerus species; by mechanical injury; desiccation; fungal diseases such as Beauvaria, Paecilomyces or Verticillium species; natural enemies in field situations. Parasitic wasps usually are more effective at low pest population densities, whereas predators are more effectiveat high population densities .However ,parasitism is often more responsive to changes in host populations and therefore more able to regulate these populations at some equilibrium level. Parasitism can be quantified by counting the number of empty whitefly pupal cases with a circular exit hole (created by the emerging adult wasp) rather than a "T" shaped split (created by the normal adult whitefly emergence). The ability of naturally occurring parasites and predators to reduce whitefly populations to low levels in unsprayed weeds and crops has been demonstrated in Florida and Texas. Such is not yet the case in the desert regions of California and Arizona where the parasites and their refuge areas are less abundant. Numbers and activity of whitefly parasites and predators can be encouraged by avoiding broad-spectrum insecticides, planting of refuge crops,

and augmentative releases. Whitefly mortality from pathogenic fungi often reach high levels in greenhouses where relative humidity is constantly high and spores naturally accumulate. Pathogenic fungi can be applied as a spray treatment and are effective at any population density .Insect pathogens used for whitefly control must be applied with good coverage and under proper environmental conditions (high relative humidity) to be effective. These products are being tested in commercial production fields and commercial greenhouses, but the economic feasibility of their use has yet to

bedetermined

Diagnosis: Pupal case spiny (Fig.1), black with a small white fringe, and oval in shape. Eggs on underside of leaves in a spiral pattern (Fig.2) and becoming black in a few days after deposition.

Economic Importance

Citrus black fly infests over 300 host plants, but citrus is the most suitable for large population development. It damages citrus by sucking nutrients from foliage which weakens the plants . kinnow black flies excrete honeydew on which sooty molds develop. Sooty molds coat citrus leaves, causing them to appear black. Sooty molds can severely impair leaf respiration and photosynthesis.

Citrus Canker

All of the agricultural pests and diseases that threaten citrus crops, citrus canker may be one of the most devastating. Citrus canker is a highly contagious disease caused by the bacterium Xanthomonas axonopodis pathovar citri. An infestation can destroy entire crops, but the disease poses no health risk to humans or animals. Severe infection may produce a variety of effects, including defoliation, dieback, severely blemished fruit, reduced fruit quality, and premature fruit drop. Citrus canker symptoms appear on the fruit, leaves, and twigs of infected plants, and typically consist of small,round, blister like formations called lesions. Lesions usually become apparent about 7 to 14 days after infection. As the lesions mature, the epidermis or outer layer of tissue ruptures, producing a craterlike spot lined with tanþcolored tissue that is usually surrounded by an oily, water-soaked margin and a yellow ring that looks like a halo. On fruit, the lesions appear scab like or corky. On leaves, old lesions sometimes fall out, leaving behind a scattering of round holesLike most bacterial plant diseases, citrus canker is greatly influenced by temperature and moisture conditions. Like most bacterial plant diseases, citrus canker is greatly influenced by temperature and moisture conditions. The disease is most likely to develop when heavy rains occur during a period when the mean temperature is greater than 68F to 20cCitrus canker spreads swiftly over short distances by wind driven rain, flooding, air currents, insects, birds, and human movement within groves. Overhead irrigation may also play a role in spreading the bacteria. Movement of infected plants, seedlings, preparative material, and fruit is the primary means of spreading the canker pathogen over larger distances. Contaminated clothing, tools, packing boxes, and other items associated with harvesting and post harvest handling of fruit are also potential sources of infection. Canker bacteria survive and multiply primarily in naturally occurring lesions. Bacteria may also survive in crevices in the bark

tissues of citrus trees. Bacterial populations appear to decline rapidly in soil. It has been suggested that the bacterium may survive at low population levels on citrus hosts without symptoms developing, and it may also survive for short periods of time on some weeds and grasses. Neither of these survival mechanisms has been proven, however.

Identification and Control

In countries where citrus canker is an established, ongoing problem, control of the disease is primarily achieved through a combination of tactics, including the production and use of disease-resistant plant varieties, use of protective sprays, and phytosanitary measures (use of certified nursery stock). Outbreaks of citrus canker may also be reduced when wind break sere constructed in windy areas. When environmental conditions are favorable for the spread of the disease, chemical control measures are not entirely effective. However, materials containing copper (bordeaux mixture, copper hydroxide, basic copper chloride, copper oxychloride, and tribasic copper sulfate) are the most effective bacterial sprays for protecting leaves and fruit. These materials can reduce the incidence of disease, but they will not eliminate established infections. Extensive use of copper may also cause phytotoxicity problems in treated groves. Pruning infected shoots or plant parts during late summer and autumn can reduce the risk of infection the following spring. Defoliation of canker-affected trees can also further reduce infection risk. In the United States, quarantining areas affected by citrus canker is still practical .Eradication of infected and adjacent trees is the most effective means of protecting commercial citrus from the disease. Once positively identified, diseased trees in commercial groves are uprooted, placed in a pile and burned. Surrounding disease-free trees are destroyed as well, as an added precaution. In residential areas, diseased trees and surrounding, exposed trees are cut down or removed. Areas where trees have been destroyed must be kept free of citrus sprouts and seedlings. Movement of citrus fruit budwood and other plant parts is prohibited from property on or adjacent to sites where infected plants are located. All clothing ,tools, and equipment used in infested areas must be properly disinfected. Kinnow at about 4 Degree Centigrade can retain it’s freshness until 2 months.

Storage conditions for Kinnow Short term temperature (oC)5

Temperature range (oC)0 - 9 Relative humidity range (%)85 - 90 Storage time3 - 16 wk

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India citrus during 1994-95 Area:442898(ha.) Production 13168082(mt.) 8.35(mt.ha.)

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