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Cultural techniques for high quality and high benefits of 'Jiefangzhong' cultivar

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SUMMARY – 'Jiefangzhong' is the leading cultivar in Changtai town, it accounts for more than 85% of the total area (4000 ha). The present paper outlines the cultivar practices needed for obtaining high quality fruits with efficiency. They are based on observations during many years of loquat culture in the area. These practices have been recommended to loquat growers for more than 15 years.

Key words: Cultural techniques, 'Jiefangzhong' cultivar, high quality.

RESUME – "Techniques culturales pour une bonne qualité et une forte rentabilité chez le cultivar 'Jiefangzhong'". 'Jiefangzhong' est le cultivar leader dans la ville de Changtai. Il représente plus de 85% de la surface totale (4000 ha). Le présent article souligne les pratiques culturales nécessaires pour obtenir des fruits de haute qualité avec efficacité. Elles sont fondées sur des observations effectuées pendant plusieurs années de culture du néflier dans cette zone. Ces pratiques ont été recommandées aux cultivateurs de néfliers pendant plus de 15 ans.

Mots-clés : Techniques culturales, cultivar 'Jiefangzhong', haute qualité.

Introduction

'Jiefangzhong' loquat is deeply appreciated by fruit farmers and consumers. Its most important features are: big fruit, easy storage and transportation and good market value. For the past several years, professional technicians and experienced fruit farmers were recruited to conduct extensive studies on cultivating techniques for loquat. Significant results have been obtained. The best cultural practices in terms of loquat quality are described.

Culture of healthy adult trees and grafted seedlings

Adult trees with big, long oval-shaped or pear-shaped fruit and without plant diseases or insect pests should be selected as scions. As a rootstock, upright seedlings with well developed root system, branches and trunks larger than 1 cm width and without any plant diseases and insect pests should be selected. Seedling trees should be grown in nursery for one year after grafting which ensures a convenient root system development.

Planting and orchard establishment

The orchard should be sketched out before planting. The length, width and depth of delve recommended is 60 × 60 × 40 cm. The delve should be filled with efflorescence surface soil and cured surface soil.

When transplanting to a final location, seedling trees should be placed on the surface, when efflorescence surface soil was used to create a mound around the base of the tree. The plant should be watered after formation of mound and then covered with weeds, rice straws, etc. to a height around 8 cm. Sticks and bamboo pieces could be used for creating a windshield.

Fertilization

Since the root system of young trees has not been well developed, frequent fertilizing with organic fertilizer should be performed. It's recommended to fertilize before each bud break growth, with around 15 kg of organic compost and 0.1-0.15 kg of urea with some lime applied to each tree. The space around loquat trees should be filled by green manure crops such as Indian cowpea to improve soil quality around the tree and speed up soil efflorescence; in the meantime, green manure should be applied to the surface when fertilizing. The ratio of N:P:K for young loquat tree should be 1:0.4:0.6.

Adult trees should be fertilized three times as described below. First, 30% of total yearly fertilization should be done during autumn bud break. Both organic and chemical fertilizers should be applied with an N:P:K ratio of 1:0.6:0.8. The second fertilization accounted for 20-30% of the whole year needs and should be added during fruit growing phase. In this fertilization inorganic fertilizer should be used mixed with organic fertilizer at appropriate amount, the ratio of N:P:K was 1:1.5:1.5. The third fertilization consisted in an N:P:K of 1:0.5:0.5, accounting for 50% of the whole year needs. It should be done seven days before or immediately after fruit picking. At flowering and young fruit phase, apply leave surface fertilizer such as KH_2PO_4 , "plant power 2003". Each year 0.5-1 kg of lime should be applied to each individual loquat plant for improving soil. Each fertilization cycle should include soil removing and covering of the base of the tree. Decomposed pig, chicken or duck dung and chemical fertilizer should be spreaded over the surface around the tree, covered with efflorescence soil to 2-3 cm in thickness, followed by covering the base of the tree with rice straw, weed, etc. to 8-10 cm in thickness.

However, in order to maximize fertilization effect and to reduce cost, fertilizer dosage should be adjusted, depending on the size of the tree crown, productivity and the way of tree growing. To those trees more vigorous, at bud differentiation phase, it is not recommended to apply excess nitrogen, which might favor tree growth thus affecting bud formation.

Training and pruning rightly

Because of the apical dominance of 'Jiefangzhong' loquat, when training the tree, a trunk shape should be applied by keeping a top branch and several twigs that grow in balance in 2-3 locations, thus forming a tree crown with distinct layers with the gap of 45-60 cm in between, no overlapping was allowed among the branches from upper and low layer. To young trees, plastic containing appropriate amount of soil was hung in a certain place to pull the branch to form a certain degree. Some twigs can be allowed to grow naturally, their tip can be picked off for branch formation.

Lightly trim 'Jiefangzhong' loquat after fruit picking and pruning off spikes. When trimming, first remove withered, weak, interconnected, diseased or infected branches. For those stem branches with too many fruits, cut them short, leaving 3-4 leaves so as to expand tree crown rapidly. Timely picking off buds if multiple new buds appeared at the branch tip, only 1-2 strong buds should be left. For each group of branches that bear fruit, only one branch should be left with 1-2 growing branches.

Flower and fruit thinning

Flower thinning should be done when spikes grow to the end of spike axle and not thoroughly spread out. Cut off one forth to one-third from the end of spike, remove 1-2 stalks at spike stem, upper and lower spikes, early and late, small, diseased and infected spikes were removed all together within a bunch of spikes. First year after field planting, all spikes should be removed; in second year, cut off 1/3 to 1/2 of spikes; in the third year cut off 1/3; and cut off 30-40% in the forth year.

Fruit thinning is made in two steps, when the fruit diammeter reaches more than 1 cm. The first fruit thinning is made for removing diseased, deformed fruit, twins fruit and those fruit spikes with more than eighteen old leaves. In second fruit thinning, remove those small, extreme large, upper lateral fruits, and fruits with extremely long stems; leaving fruits with even size and fruit spikes with more than twenty old leaves. Thus the whole bunch of fruit would mature at the same time to facilitate putting bags and picking. Each bunch would contain 2-4 fruits.

Timely bagging and picking

Bags were put on loquat clusters when fruit color turns from green to white. Early bagging would affect fruit flavor and quality; late bagging would negatively affect fruit appearance and easily cause sunburn, anthrax, rust and bird damage. Water-persistent heavy kraft paper with good permeability should be used for bagging, bag size of 25 × 20 cm are the most recommended, after bagging the bag should have a triangle shape.

Based on years of experience of local fruit farmers, the best time for loquat picking is when the fruit is 85% ripened or more, fruit color is light orange red. Early picking results in insufficient sweetness and excess of acidity; whereas late picking causes wrinkled fruit, mechanical damage, low post harvest ability, low sugar and worst flavor.

Preventing and treating plant diseases and insect pests comprehensively

At each budding phase (except spring budding), spray 10% efficacious "Mie Bai" (Chinese pesticide) solution at 1:2000-3000 dilution, 70% wettable thiophanate powder preparation at 1:1000 dilution or "Kuai sha Ling " (Chinese pesticide) at 1:1000 dilution. These are applied to prevent and cure *Selapa celtis* Moore, *Phalera flavescens* Brem., *Pestalotia funereal* Desm. and so on. In spring, care must be taken to prevent and cure rotting diseases. After thoroughly scratching off disease speckles on loquat tree, brush those places with streptomycin, KMnO_4 , replace old soil with fresh soil around root neck. Mulberry longhorn beetle, their eggs and larva can be stabbed, or fill the worm nest with cotton liquid containing ten-fold diluted "Di sha" (Chinese pesticide).

In summer, manual catching of *Selapa celtis* Moore and *Phalera flavescens* Brem. should be performed. The orchard should be cleaned in winter, after fruit picking, which includes swiping off and burning of fallen leaves and branches, diseased fruits, diseased and infected branches, and plowing up the whole orchard to eliminate contamination sources.

