High Yield Cultivation and Pest Control Technology of Cashew

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Abstract In order to enhance the yield and quality of cashew, it is essential to implement high-yield cultivation techniques effectively throughout the production process. Additionally, pest control measures should be employed to provide technical support for the industrialized development of cashew.

Key words Cashew; High yield cultivation; Pest control technology

1 Introduction

The cashew (*Anacardium occidentale* L.) is a perennial tropical evergreen tree belonging to the genus *Anacardium* of the family Anacardiaceae. The tree has a developed taproot, rendering it both an economically valuable fruit tree and an excellent afforestation species. The cashew apple, which develops from the receptacle, is not only juicy and sweet but also rich in vitamin C. This vitamin can be used for fresh food, as well as for processing cashew juice beverages, cashew apple wine, and dried fruit products[1-2]. The cashew kernel is a nutritionally dense food source, rich in vitamins A, B, and unsaturated fatty acids. Additionally, it can be utilized for oil extraction, with both the kernel and oil exhibiting beneficial effects on cardiovascular and cerebral vascular health. The extraction of oil from cashew shells, known as shell oil, can be fractionated to yield monophenols, surfactants, and modified epoxy resin. These applications are found in a multitude of fields, including industry, cosmetic medicine, military industry, and others[3-4]. The hybridization of cashew, fertilization technology, and the analysis of cashew apple composition have been extensively researched and documented[5-8]. However, high-yield cultivation technology has not been widely reported. A set of high-yield cultivation techniques for cashew is required with the utmost urgency in order to provide a theoretical basis and technical guidance for cashew growers.

2 High-yield cultivation techniques

2.1 Orchard site selection The cashew is a species that thrives in environments with high levels of light, is drought-tolerant and water-intolerant, and is susceptible to cold temperatures. It is therefore suitable for cultivation in sandy and loamy soils, as well as in ruffled wastelands. It is recommended that cashew orchards should be situated in areas with an annual mean temperature of 23 - 28 ℃, a monthly mean temperature of 23 - 29 ℃, and a mean temperature of coldest month of 10.0 ℃ or above[6]. Although cashew trees are not particularly demanding in terms of soil quality, they should be planted in areas with gentle slopes and undulating topography, as well as in locations with good drainage, low underground water levels, and deep soil. It is recommended that orchard establishment should be conducted in an environment with sufficient water and gently sloping land, with a soil quality of sandy loam. This will result in the optimal conditions for the growth of the orchard[8].

2.2 Selection of varieties At this stage, cashew variety can be selected from a diversity of excellent genotypes that exhibit fast growth, high yield, resistance, and adaptation to the local ecological environment. For instance, FL30, HL2-21, HL2-13, GA63, CP63-36, and other high-yielding asexual genotypes have been selected and bred by the Tropical Crops Genetic Resources Institute, Chinese Academy of Tropical Agricultural Sciences[9].

2.3 Planting It is recommended that cashew seedlings should be planted on plots that are well ventilated. When planting cashew seedlings, it is advisable to select thicker grafted seedlings that are free from any disease. The optimal planting period is during the beginning and middle of the rainy season, which spans from June to August. The specific density of planting depends on various factors, including the topography of the orchard, slope terrain, climatic conditions, rootstock types and varieties. In general, the planting density of cashew is 4 m × 5 m or 5 m × 6 m, with north-south rows. The tree shape can be chosen as either a spindle or pyramid shape. A planting pit measuring 1 m in length, 1 m in width, and 0.6 m in depth should be dug to ensure that the root system of the seedlings can grow well. In the event of a shortage of seedlings, replanting should be carried out at an appropriate time, preferably during the rainy season, and within one year after planting.

2.4 Fertilization and water management It is recommended that water should be applied to the soil of the tree tray on a regular basis following the planting of the tree. In the event of drought conditions, the frequency of watering or irrigation should be increased. During the growth process of cashew, it is necessary to apply fertilizer at the appropriate time. Additionally, each cashew plant should be regularly watered and fertilized. For young trees,

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the application of water and fertilizer should be minimal, with nitrogen fertilizer being the primary focus. In the initial year, approximately 35 g of a compound fertilizer should be applied to each plant. In the second year, the dosage should be increased to 100 g of the same fertilizer per plant. In the third year, the dosage should be further increased to 250 g of the same fertilizer per plant. In addition to this, the application of potash or phosphorus fertilizer should be adjusted according to the actual growth of the tree[10-11]. It is recommended that fertilizers should be applied to fruiting cashew trees in a targeted manner, taking into account their different growth periods. Furthermore, it is advised that cashew trees should be treated with insecticides and fungicides in conjunction with fertilizer management at the appropriate time during the growth process.

2.5 Management and pruning of tree shapes Young cashew trees are primarily pruned lightly, and a topping treatment is performed when the trees reach a height of approximately 1 m to enhance branching. According to the shape of the cashew tree, lateral branches of the central trunk are thinned below 60 cm from the ground to ensure the dominance of the central trunk of the cashew tree. In the case of main backbone branches with multiple trunks, poor trunk angles, and undesirable branching, the correct procedure is to reposition them by amputation, auxiliary traction, and bud carving, as appropriate. It is recommended that adult trees should be pruned to remove inner branches, weak branches, deformed branches, and cross branches. This practice enhances the tree's growth potential, improves its ventilation and light conditions, and increases the fruit-bearing area.

3 Countermeasures against diseases and pests

3.1 Diseases The most prevalent diseases afflicting cashew trees are root rot, leaf blight, and anthracnose. Root rot can be effectively treated with carbendazim, a fungicide, at a concentration of 50% and a dilution of 1 000 – 1 500 times for irrigation. Alternatively, Bordeaux liquid, a Bordeaux mixture, can be used at a concentration of 1% and a dilution of 500 – 1 000 times for the same purpose. The application of 50% procymidone at a 1 000-fold dilution, 50% benomyl WP at a 1 000-fold dilution, and 50% carbendazim · diethofencarb WP at a 1 000-fold dilution can effectively prevent and control leaf blight. The prevention of anthracnose can be achieved through the application of a solution comprising 45% lime sulphur, diluted 150 times, to the crown at the pre-sprouting stage. Alternatively, the use of a solution comprising penncozeb at the time of flowering and fruiting can also be employed. The application of a solution comprising 14% difenoconazole GR at the early stage of infection can effectively prevent and control anthracnose[8-9].

3.2 Pests The cashew tree is susceptible to a number of insect pests, including bell moths, leaf blotch miners, tea bagworms, tea mosquito bugs, red-banded thrips, *Nephopteryx* sp., and longicorn. Bell moths, leafblotch miners, and tea bagworms can be controlled with 1.8% abamectin EC 2 000 times dilution, 20% diflubenzuron SC 2 000 – 3 000 times dilution, and 4.5% beta-cypermethrin EC 2 500 – 3 000 times dilution. The control of tea mosquito bugs can be achieved through the use of 4.5% beta-cypermethrin EC 2 500 – 3 000 times dilution, 20% sumicidin 2 000 times dilution, and 5% imidacloprid EC 1 000 – 2 000 times dilution. The control of red-banded thrips can be achieved through the use of 1.8% abamectin EC diluted 1 000 – 1 500 times, 3% acetamiprid EC diluted 1 500 – 2 500 times, and 5% imidacloprid EC diluted 1 000 – 2 000 times. The control of *Nephopteryx* sp. can be achieved by 4.5% beta-cypermethrin EC diluted 2 500 – 3 000 times and 2.5% deltamethrin EC diluted 1 000 times. The control of longicorn can be achieved by the application of 41% chlorpyrifos EC, 26% fenpropathrin, and 4.5% beta-cypermethrin EC diluted 800 – 1 000 times[8-9].

4 Conclusions

In conclusion, in order to maximize the yield of high-quality cashew, it is essential to reinforce the implementation of high-yield cultivation and management techniques, scientific orchard management, the rational development of pest control methods, and to reduce the cost of cashew planting in an effective manner, thereby enhancing the economic benefits of growers.

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