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High density planting of Cashew: A tool to achieve higher crop productivity

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High density planting of late became a very popular technology in most of the crops to harness the initial benefits of closer planting in the orchards. In tree crops when go for wider spaced planting lot of space will get wasted, at least for initial few years. Many occasions, the mixed or inter cropping in the vacant spaces with annual crops species is suggested to cover such spaces and exploit maximum out of the given piece of land. But in crops like cashew as the production is as such very low and requires meeting the demand in short span of time, high density is proved to be a successful venture in the initial few years to achieve higher productivity.

Requirements of high density planting in Cashew

In order to use the land intensively for realizing higher productivity per unit area, especially in the early phase of the plantation and also to achieve the higher economic returns in the early phase, high density planting techniques can be adopted. This also can be followed where the soil fertility is poor for which the canopy expansion will not fast. This method involves planting of more number of grafts per unit area as compared to that of normal density of 200 numbers of grafts at 7 m X 7 m spacing. In order to achieve higher density, grafts are planted at 4 mx4 m, 5 mx5 m or 8 mx4 m for the planting density of 625, 400 or 312 per hectare, considering the suitability, purpose and need. Depending on the type land, higher density population is retained for the initial period 7-10 years. This actually is based on the rate at which the canopy is expanding in orchard conditions. In poor soils, rate of growth will rather slow and hence population density can be maintained for longer period till the canopies of the adjoining trees touch with one another. On the other hand, in fertile soils canopy expansion will be faster indicating the early thinning of population to overcome competition among the trees for soil moisture, nutrients and light. Finally, at full growth stage, population is reduced to normal density of 200 trees by thinning down the population periodically.

This is a specialized technique, which needs intensive management of nutrient supply, canopy pruning and irrigation practices with view to maintain sustainability in the long run. Studies have indicated that cashew yield can be increase to three to four folds in the initial phase up to 6-7 years which would further decline gradually up to two fold at 12th year in a plantation with density of 312 to 625 trees per hectare as compared to plantation of normal density of 200 trees per hectare. This

system also overcomes exposure of ground to the sunlight, especially in the peak summer and thereby decreasing the soil moisture evaporation. Heavy deposit of leaf biomass on the ground also conserves moisture and also adds in situ-recycled nutrients to the soil. There will also be reduced under canopy weed growth. Due to pruning and thinning, substantial quantities of fire wood can be obtained.

Package for establishing high density Cashew orchards

Pits of 100 cm x 100 cm x 100 cm should be opened at 4 M distance between two rows as well as in each row between two pits. In slopy area pits should be opened all along the contour line at 4m distance from one row to another row as well as from one pit to another pit within the row. The pits are then filled with a mixture of top fertile soil, with 8-10 kg organic manure and 200 g rock phosphate. After planting Cashew grafts proper staking should be done to avoid breakage in the graft joint due to wind blow. Mulching with dried leaves or green leaves should be done to prevent soil erosion particularly in slopy area during rainy season and also to conserve moisture in summer months.

The fertilizers and organic manures in the first year are applied within 50cm radius from the stem of plant @ 366 g urea, 67 g muriate of potash and 200 g rock phosphate/tree/yea. In the second year fertilizer and organic manure should be applied at 75 cm radius away from the stem of the plant in circular trench dug out (25cm width 15 cm depth). The poultry manure @ 2 kg/plant should also be applied in the trench and covered with soil. Mulching should be done immediately after the application of manures. Third year onwards full dose of fertilizers and 5 kg of poultry manure/ plant should be applied in circular trench dug out 1.5m away from stem of the tree (1100 g urea 625 g rock phosphate and 200 g muriate of potash/plant/year).

De blossoming should be done for the first one year to encourage development of proper canopy. Regular shape pruning should be done to achieve umbrella shape canopy with uniform spread. During the first 6 years the crop canopy covers almost 100 % of the given ground area. Beyond 6 years because of over lapping of branches thick shade is formed which in turn reduces yield. It is at this stage branches towards the periphery end are cut back by 0.5 m radius around to allow 80% of light interception by the crop canopy and remaining 20 % to the ground penetrating through gaps in the canopy. Normally pruning is done during August. Soon after this 10 % Bordeaux paste is applied to the cut ends of the thicker branches. De topping at 3m height from 5th year onwards is necessary. By 11^{th} year it is necessary to thin out tree population to 50% by removing every alternate tree in each row. Once the canopy has developed pruning of leader shoots (last year's growth) should be done at least once in two years regularly. At least 60 % of the canopy spread should be used for pruning. Length of leader shoot to be pruned should not be less than 8cm and more than 12 cm. This will further increase yield by giving out more number of productive lateral shoots which flower in the same year.

Ultra high density planting

Ultra Density Planting in Cashew @ 1100 to 1600 plants/ha or more, maintenance of productive canopy by pruning technique for obtaining early benefits and higher yield was developed, standardized and demonstrated in farmers field (> 500 ha) for the first time in the Directorate of Cashew Research, Puttur.. The technique has shown to improve the yield by 3-4 times per unit area over traditional type of planting. With this technique targeted yield can be achieved in a short span of time. The precocious type of varieties such as VRI-3, NRCC Sel-2, Ullal-1 and Ullal-3 were identified for this technology.

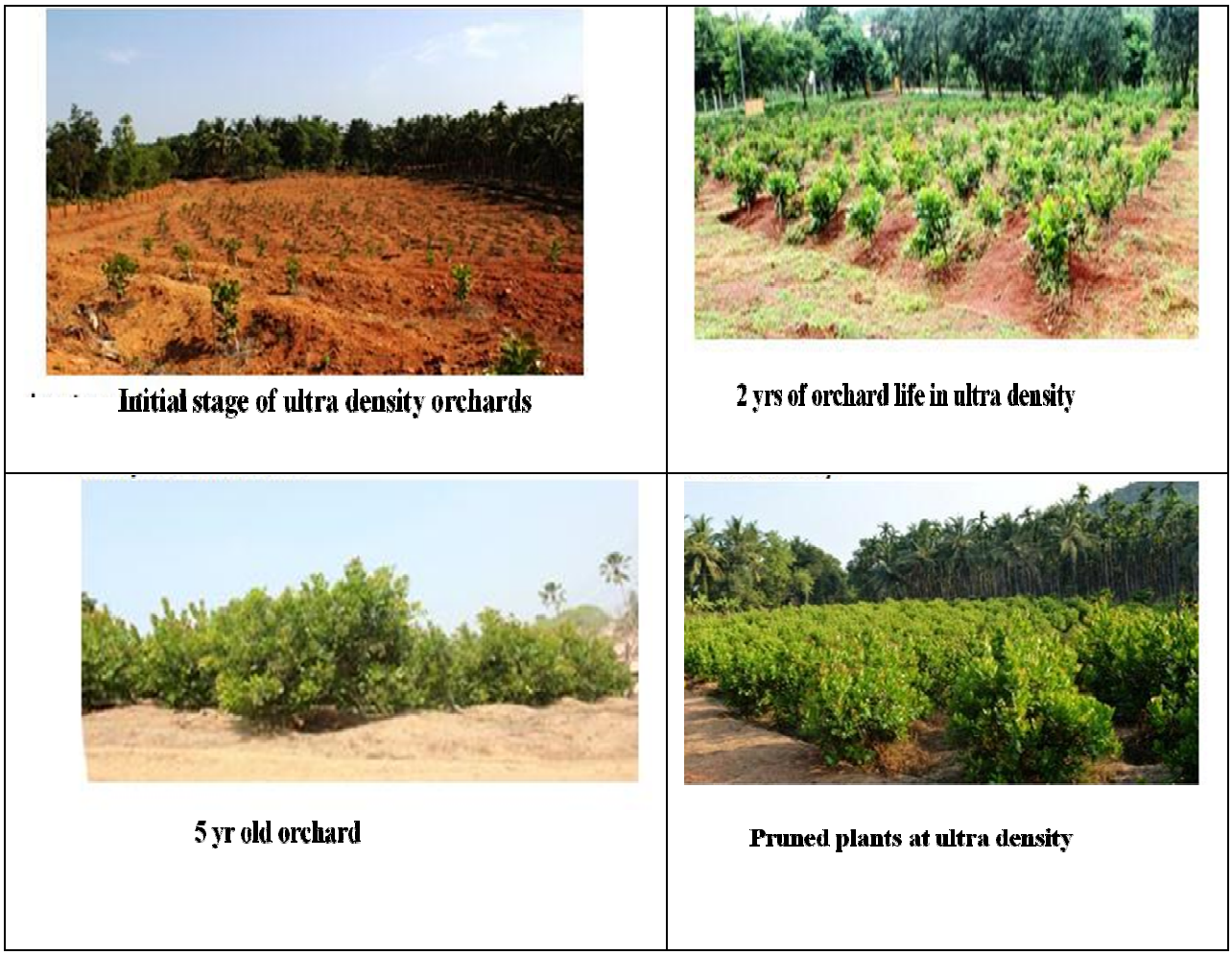

Fig. 1: Ultra high density planting in Cashew

Conclusion

High density planting of cashew is more suitable in less fertile area. Because in area where soil fertility is low growth of the plant is very much slow resulting less ground coverage in the initial years. In such locations, cashew yield can be increased to 4 folds up to 6 years and 2.5 folds up to 12 years if high density planting system of 625 trees/ha is maintained

Fig. 2: Performance of plants under ultra density planting

Key points

- Very low gestation period
- Early realization of income
- Efficient utilization of land
- It can be adopted even in areas of low soil fertility

Reference

1. E manual on Advances in Cashew production Technology. ICAR-Directorate of Cashew Research, Puttur.