

for nutrients as the tree is entering the re-productive phase. Hence proper fertiliser application is essential during this growth phase. Preferably the fertilizers to cashew are to be applied in two split doses; one at the onset of the monsoon and the second during the post-monsoon period, ensuring adequate soil moisture availability. If only a single application is possible due to labour constraint or other reasons, then this can be done during post-monsoon period when sufficient soil moisture is available. Circular trenches of 25 cm deep and 15 cm wide are opened at a distance of 0.5, 0.75, 1, 1.5 m away from the trunk during 1st, 2nd, 3rd and 4th year after planting and onwards respectively in laterite soils in heavy rainfall areas in the west coast. In loamy soils of low rainfall east coast, fertiliser can be applied in 50 cm circular strips. The trench should be closed immediately after the application of fertilizers and green leaves can be spread as mulch. During 1st, 2nd, 3rd, 4th and 5th year of planting 1/5th, 2/5th, 3/5th, 4/5th and full quantity of recommended dose is to be applied. Micronutrient application as a foliar spray is to be undertaken based on soil test or as recommended.

Plant protection

Management of cashew stem and root borer (CSRB)

Cashew stem and root borer infestation can lead to the death of the cashew tree and hence needs to be checked in the initial stages of infestation. In CSRB infestation, gum and frass start oozing out from the tree base; which is the initial symptom of pest attack for taking up curative measures. The infested portion should be carefully chiselled off to kill the grub or pupa and swab the affected portion with 10% neem oil suspension or 0.2% chlorpyrifos. It can be controlled by proper maintenance, quarantine, periodic survey and removal of grubs, and removal of severely infested trees.

Management of tea mosquito bug and minor pests

Tea mosquito bug (TMB) attack leads to a reduction of yield to the tune of 30-40% by sucking sap from tender shoots, leaves, inflorescence and nuts. Both adult and nymph suck the sap from tender shoots, panicles, immature nuts and apples which lead to the formation of black lesions that coalesce together causing shoot blight or blossom blight. Need-based application of pesticides is to be made. The spray is to be arranged as per the crop phenology and after observing TMB attack in the field. Pesticide spray may be required during flushing, flowering and fruiting stage. For early varieties,

all the spraying activities are to be performed from October to February. The insecticides recommended for spraying are as follows.

Flushing stage	Monocrotophos (0.05%, i.e. 1.5 ml/L) Imidacloprid 17.8 SL (0.6 ml/L) Acetamiprid 20 SP (0.5 g/L) L-Cyhalothrin (0.003%, i.e. 6 ml/10L) Profenphos 50 EC (0.05%, i.e. 1.5 ml/L)
Flowering / Fruiting stage	L-Cyhalothrin (0.003%, i.e. 6 ml/10L) Carbaryl (0.1%, i.e. 2 g/L) Triazophos 40 EC (1 ml/L) Profenphos 50 EC (0.05%, i.e. 1.5 ml/L)

Following clean cultivation by removing weeds is another component of cultural management of TMB. The red ants and weaver ants (*Occoyphylla smargdina*) are reported to be helpful to check the TMB. The red ants feed on the nymphs of the tea mosquito bugs. Placing small pieces of jaggery at the cracks and crevices of the bark can attract the red ants and tying ropes among trees can facilitate the movement of ants. Limited control of TMB with the use of botanicals such as water extracts of *Annona reticulata* (15%), *Adathoda vasika* (12%), *Pongamia pinnata* (20%) and diluted cashewnut shell liquid, in controlling tea mosquito bug has been reported.

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Cashew Cultivation Guidelines for Drought Prone Areas



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CASHEW CULTIVATION GUIDELINES FOR DROUGHT PRONE AREAS

Cashew is one of the important foreign exchange earning crops in India. Traditionally cashew is grown in the coastal regions in India. The major cashew growing states along the west coast are Maharashtra, Goa, Karnataka and Kerala. Along the east coast, the major cashew growing states are Tamil Nadu, Andhra Pradesh, Odisha and West Bengal. The non-traditional areas of cashew cultivation are Bastar region of Chhattisgarh and Kolar (Plains) regions of Karnataka, Gujarat, Jharkhand and in NEH region.

The research studies showed that the mean rainfall distribution in cashew area ranged from low rainfall (1500-2000 mm in Gujarat) to high rainfall (2700 to 3500 mm in West coast and NEH region). In India, the vegetative development of cashew occurs during the rainy season (August – October), and the reproductive phase during the dry season (December – June). Although cashew is grown in high rainfall environment, it experiences severe moisture stress during January to May. Incidentally, the critical growth phases such as flushing, flowering and nut formation in cashew also occur during this period. Any form of stress, biotic and abiotic stresses during this period adversely affects the flowering and fruit set and results in premature nut drop and finally reduces the yield and productivity of cashew. Certain cashew growing regions are frequented by drought which adversely affects the yield. Strategies and cultivation practices for the drought-prone areas of cashew regions is provided in this publication.

Varieties suitable for drought-prone coastal areas of India

For drought prone areas, the varieties which enter into reproductive phase early are recommended. The list of varieties which flower early and complete the fruiting in short period along with their characteristics are listed below:

Early and short duration varieties of Cashew

Ullal-4

It is a selection from 2/77 Tuni Andhra and released in 1994 for general cultivation. The average yield is 9.5 kg/tree. The nut size is medium with 7.2 g nut weight. The shelling percentage is 31%. Export grade of kernels conforms to W210 counts/lb. The colour of the apple is yellow and apple weight is 75 g.



Vengurla-1

This is a selection from the germplasm Ansur-1 collected from Ansur village in Vengurla Tehsil of Maharashtra. The average percentage of perfect flowers is about 8%. The average yield is 19 kg/tree. The nut weight is 6.2 g with the shelling percentage of 31%. It is an early flowering variety. Colour of the apple is yellow. Kernel grade is W240.



Kanaka

It is a hybrid of cross BLA 139-1 x H 3-13 released in 1993 from CRS, Madakkathara. It is an early variety. Average yield is 19 kg/tree with a mean nut weight of 6.8 g. The shelling percentage is 31%. Kernel weight is 2.1 g and quality of kernels conform to W210 export grade. Colour of apple is yellow.



NRC Sel-2

This is a selection from the segregating seedling progeny of 2/9 Dicherla (VTH 40/1), originally a collection made from Andhra Pradesh. This variety was released in 1989. It has a midseason flowering habit (November-January) with a flowering duration of 74 days. The number of fruits per bunch is 3. The average yield is 9 kg/tree. The nut weight is 9.2 g. The shelling percentage is 28.6% and kernel grade conforms to export-grade W210. Colour of apple is pink.



The list along with characteristics of varieties that are early in flowering with long flowering and fruiting duration is given below:

VRI-3

This is a selection from the seedling progeny of a high yielding tree collected from a village Edayanchavadi in South Arcot District of Tamil Nadu and was released in 1991. It has 12.1% perfect flowers. The average yield of this variety is about 10 kg/tree. The nut size is medium with 7.2 g nut weight and shelling percentage of 29.1%. The kernel grade



conforms to W210 export grade. This variety is picking up fast among farmers of not only of Tamil Nadu but also of other states.

H-130

A jumbo nut hybrid (H-130) which is superior in yield (3 kg/tree in 3 years of planting) with cluster bearing (10-20 nuts/panicle) and bold size (12-13 g nut weight) was evaluated and released for cultivation and performance evaluation in the selected farmers' field. The hybrid is highly precocious, early flowering with long fruiting duration. The plant is vigorous but with sparse canopy and having large leaves and big inflorescence with sturdy 8-10 rachis. The hybrid responds well to pruning and is suitable both for ultra-density planting and normally spaced plantations. Hybrid has high shelling percentage (29.9%) with big kernels of 3.5 – 5 g weight, a rare type among released varieties and falls under W130-150 category kernel grade.



Training and pruning

Training is a method of regulating plant growth in the desired direction during the early years of planting to form a definite canopy shape. Such type of initial training provides a good architecture to the plants and further helpful in increasing the production. Cashew plantation under normal or less spacing requires regular pruning to avoid unnecessary supply of photoassimilates to unproductive shoot i.e., water shoots and weak branches. In cashew, trimming of exhausted branches induce productive growth and helps to promote the yield. In drought-prone areas the training and pruning are to be completed by April – May, after the harvest is over, depending on the variety.

Nutrient management

Since the cashew growing soils are deficient in organic matter, application of 10-15 kg farmyard manure or compost per grownup tree is recommended. This has to be undertaken either before the onset of monsoon or in August-September, during the receding periods of monsoon. Fertiliser as per the recommendation for the region is to be applied after cessation of heavy rains and after weeding and clearing the base of individual trees. The key to enhancing the fertilizer use efficiency is to synchronize the time of fertilizer application with the growing need of the crop and period of high root activity. Flushing and early flowering phase (September to December) is the period of increased root activity aiding enhanced absorption of nutrients from the soil. Therefore effort should be made to coincide the fertiliser application with this phase. During the flushing phase there is heavy internal demand