



DROUGHT MITIGATION IN COCOA

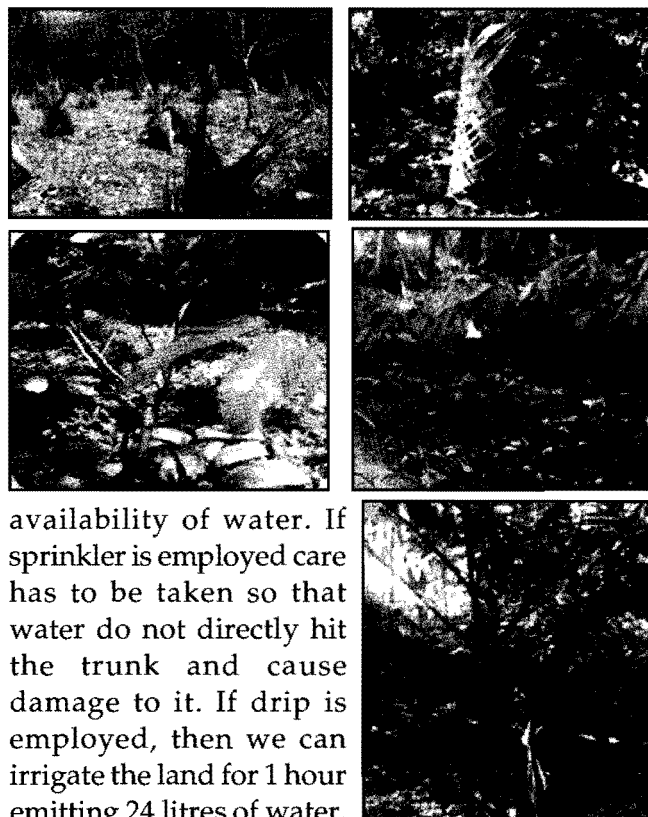
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Chocolate, the most luxuriance enjoyed by the human is going to extinct due to climate change (Scott, 2016) and it may become reality as soon as 2050. Evolving genotypes which can tolerate drought is the only ultimate solution (Santos *et al.*, 2014). However it is not an easy task in plantation crop like cocoa. The immediate alternative is to mitigate drought by adopting good agricultural practices (GAP).

Climate change has large implications for the future of cocoa production since last 3 years. Hence, it is the need of the hour to mitigate the impact of climate change on cocoa with climate-smart agriculture. The programme must be focussed on making the current trees more resistant to climate change. About 70 percent of Indian cocoa is grown under irrigated condition (Balasubrahmanian, 2000). This itself indicates the importance of proper drought management.

Cocoa is a plant that has originated under shade and has been traditionally cultivated under shade. The shade requirement varies widely depending upon the stage of growth and it is as much as 75 percent in the early stages. This can be gradually brought down to 25 percent during later stage of growth (Wood and Lass, 1985). Shade can be provided by using permanent shade trees or temporary shade trees. The common plants that can be used as shade trees includes banana, *Glyricidia* (*Glyricidia maculata*), subabul (*Leucaena leucocephala*), etc. This will help in early establishment and good vegetative growth in cocoa with minimum water requirement. If temporary or permanent shade trees are not planted, shade can be provided by covering the seedlings with coconut leaves (Plate 1).

Since this crop is very much sensitive to drought, it is advisable to start irrigation during the first week of cessation of rains and thereafter at 5-7 days interval depending upon the soil texture. The summer season coupled with dryings demands irrigation once in 4 days used for maintaining growth and production. Any of the irrigation methods like check basin, sprinkler and drip may be adopted depending upon the



availability of water. If sprinkler is employed care has to be taken so that water do not directly hit the trunk and cause damage to it. If drip is employed, then we can irrigate the land for 1 hour emitting 24 litres of water.

It is found to be most effective method in terms of water use efficiency (Prasannakumari *et al.*, 2009)

In order to increase the water use efficiency and enhance the microclimate at the root zone, husk burial can be employed. It is found to be effective in both seedling and matured plants (Plate 2).

Drip irrigation coupled with husk burial is found to be very effective and only 24 liters of water is required for two weeks where as any other methods demand 24 liters of water for 5-6 days. More over due to the enhancement in microclimatic condition increased flower and fruit production is also recorded.

The average leaf litter added in a cocoa plantation is 5.3-8.2 t/ha/yr. This will act as a natural carpet preventing evaporation and thus conserving the moisture. Hence, it is advisable to least disturb the field during summer (Minimol *et al.*, 2011).





Close-centred Pruning has to be adopted in order to prevent direct penetration of sunlight to the trunk (Plate 3). This is because high intensity light will damage the cushions, resulting in low flower production and fruits (Suma and Minimol, 2015).

Mitigation of drought by timely and intelligent interventions will help to save the crop from threat of extinction.

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Articles invited for The Cashew and Cocoa Journal

The Cashew and Cocoa Journal is a quarterly, publication in English publishing by Directorate of Cashewnut and Cocoa Development, Cochin, Ministry of Agriculture and Farmers Welfare, Government of India, dealing with Promotion and Development of Cashewnut and Cocoa in the country. It has wide circulation among farmers, Extension Workers, Scientists, Exporters, Industrialists etc.

The Journal contains popular articles on scientific cultivation, processing and marketing aspects and statistics of the above crops. Quarterly News and Events of the Directorate organized for the benefit of farming communities are also featured.

Instructions for submission of Articles in the Journal

1. Article intended for publication in "The Cashew and Cocoa Journal" may kindly be sent in MS Word/pagemaker format (Font: Times New Roman, 12 point size) in CD along with two sets of hard copy. The material for publication should be typed in double space without correction and overwriting. All pages including tables,

legends and references should be numbered consecutively.

2. The matter arranged in the following order:
 - a. Title in capital letters
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 - c. Introduction highlighting the importance of the subject
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 - f. Tables, illustration, Photographs etc. should be cited in the text appropriately. Line drawing must be in black colour. Photographs in colour or black & white with title indicated clearly in JPEG (High Resoulution) format.
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3. Preference will be given to article in bilingual i.e., Hindi and Englsih.
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