Check These Disorders in Coconut

by Chacko Mathew*

The proper growth and productivity of the coconut palm depend to a large extent on improved management practices. Scientific cultivation of coconut definitely warrants better care and attention to the crop. Only under good care and management can a sustained high yield be obtained from the coconut palms. However, the coconut gardens of small holders in general, remain practically neglected, with the result, that a number of disorders develop in the palms, leading ultimately to Poor yield. Two of such important disorders viz. 'Button shedding' and 'Foliar yellowing', causing much embarrassment to coconut growers; are discussed below.

I. Button shedding

Button shedding is a common phenomenon met with in coconut gardens throughout the world. Though the coconut inflorescence produces a large number of female flowers, a good majority of them are shed at various stages of development. Most of the shedding occurs during the first two months after the opening of the flowers. Shedding was observed to be maximum during the second and third week after fertilization. Button shedding occurs throughout the year without any significant monthly variations.

Coconut growers, at large, are in the dark as to the real causes of button shedding. This vexed problem has attracted the attention of research workers since very early time. Considerable work in this direction has been carried out in different parts of the world. Research workers have attributed this phenomenon to several widely separated causes. The important among them are the following:

1. Poor bearing capacity of the tree

It is a matter of common notice in coconut palms, that all the female flowers except two or three in a bunch fall after the inflorescence opens. This happens in spite of the best care and management. 'Button' shedding in such cases is obviously due to hereditary defects. The inherent capacity of the tree to bear fruit is poor in such cases. If the original planting material used happens to be poor in quality it would result in the establishment of a plantation giving poor yields. This underlines the need to plant quality seedlings that will ultimately give good returns to the growers.

2. Severe drought

Another important cause of button shedding is water scarcity. When unfavourable moisture conditions prevail, and in times of drought, coconut palms show signs of weakness such as drooping of leaves, breaking of petioles and large scale shedding of buttons and immature nuts. In Sri Lanka, it was observed that water deficiency affected not only the setting of nuts but also resulted in severe shedding of nuts, especially after a period of prolonged drought. Similar results were obtained from the studies undertaken in Kenya.

It is evident, therefore, that conservation of soil moisture is an

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essential requisite in controlling button shedding. During summer months the moisture content of the soil decreases significantly and the necessity of irrigation creeps in. Copious irrigation during this period will bring about considerable reduction in button shedding.

3. Nutritional deficiency

Nutritional deficiency in the soil is considered to be another important factor contributing to button shedding in coconut. The three major nutrients required for the normal growth and productivity of coconut, are nitrogen, phosphoric acid and potash. The deficiency of any one of these affects the productivity of the palms. Continuous removal of nutrients from the soil in large amounts, consequent on the unique bearing feature of the coconut palms, is likely to create nutrient deficiency in the soil.

Judicious application of manures helps to maintain a high fertility level in the soil and thereby avoids many disorders in coconut.

4. Unfavourable soil conditions

Button shedding is also found to be associated with unfavourable soil conditions like water-logging, want of proper aeration etc. These conditions prevail mostly in heavy soils and are found to be detrimental to the healthy growth and functioning of the roots. When root growth is impeded the absorption of water and nutrients is reduced, resulting in premature nutfall and button shedding. In heavy soils, especially under continuous spells of rain button shedding was observed to be severe.

In order to carry out the process of growth and absorption of nutrients, the living cells of the roots should have a regular supply of oxygen. This can be accomplished only by regular cultivation. Cultivation practices such as ploughing, digging, piling up of mounds etc. in coconut gardens will help to open up the soil, improve its texture and make it suitable for root growth. Opening suitable drains in water-logged areas is also beneficial. Growing a green manure crop and ploughing it into the soil is also recommended. This will add to the organic content of the soil, enable it to retain moisture and make it well aerated.

5. Diseases

Diseases like root wilt, 'Mahali' etc. are known to cause button shedding. Immature nut fall in the case of 'Mahali' is caused by fungus attack. In such cases the fallen nut will have some discolouration at the portion adjoining calyx.

When the shedding is due to a fungal disease, spraying of a suitable fungicide like Bordeaux mixture or Perenox on the inflorescence when it opens, will be beneficial.

The possibility of utilising growth promoting substances in controlling button shedding was investigated in studies conducted at Central Plantation Crops Research Institute, Kasaragod. The results of these investigations showed that the application of one of the growth promoting substances, 2, 4—D, helped to secure increased set of nuts. However, the results secured were not attractive enough to the cultivators to adopt these methods owing to reduction in size of the nuts developing from these hormone sprays. Further work in this direction is under way.

II. Foliar Yellowing

Foliar yellowing is another malady prevalent in coconut growing tracts, causing much headache to the coconut cultivators. Three different types of foliar yellowing are generally noticed in coconut gardens. They are:

1. General foliar yellowing
2. Seasonal foliar yellowing
3. Foliar yellowing associated with root (wilt) disease

Of these three types, general foliar yellowing is mostly seen in low lying areas, where the soil is subject to water-logging for a major part of the year. The uncongenial root environments in water-logged soils and the consequent disturbance in the absorbing mechanism of the roots hamper the normal functioning of roots. Further, the anaerobic decomposition of organic matter in the water-logged soils produce organic acids in the soils, which in the absence of sufficient supply of bases, lower the PH of the soil, making the sub-soil water acidic. These conditions cause disturbances in the physiological process which regulates chlorophyll formation, and its stability in the leaves, resulting in the development of foliar yellowing.

General foliar yellowing may also occur due to nutritional deficiency. Pot culture experiments conducted at Central Plantation Crops Research Institute, Regional Station, Kayangulam have shown that the coconut seedlings grown in nitrogen deficient soils were uniformly yellow. Cases of foliar yellowing due to potash deficiency have also been reported by research workers. Foliar yellowing is also

observed in certain eroded hill sides in several localities. Root damage due to exposure in the eroded region as well as loss of essential plant nutrients may be the cause of this yellowing.

The second type viz., the seasonal foliar yellowing occur as a seasonal feature mostly in sandy and sandy loam soils along the coastal districts. In this case yellowing is caused mainly due to heavy leaching of nutrients during the monsoon rains. Here also, yellowing is generally restricted to the outer and middle whorls of leaves and is mostly discernable during the months of June, July and August, every year. Again, in the laterite and sandy tracts of Kerala, intensive foliar yellowing may be observed during summer months. This is evidently due to acute drought conditions lack of sufficient moisture in the soil adversely affects the absorption of nutrients, leading to disorders in chlorophyll synthesising mechanism.

In the third type, yellowing is restricted to the outer whorls of leaves, and is commonly found associated with root (wilt) disease of coconut. Yellowing in this case develops from the tips and margins of the leaflets and slowly advances towards the basal portion. Studies conducted at Central Plantation Crops Research Institute, Regional Station, Kayangulam have indicated that this type of foliar yellowing is caused by an imbalance in the potassium/magnesium nutrition. Heavy manuring with refined potassic manures over several years, especially in acid soils, tends to induce magnesium deficiency. Magnesium is the only metallic element that goes into the constitution of chlorophyll, the green pigment in plants. The deficiency of magnesium, therefore, impairs the synthesis of chlorophyll in the leaves, leading to yellowing.

Control measures

Foliar yellowing in coconut can be checked to a great extent by adopting suitable control measures. Soil management designed to provide good drainage helps to check this malady to a considerable degree, especially in the low lying areas. This has been amply proved from studies conducted at Central Plantation Crops Research Institute, Regional Station, Kayangulam. It is also desirable to plant coconut seedlings on raised bunds in low-lying tracts. Proper measures to prevent soil erosion, split application of fertilizers every year, copious irrigation during summer months are the other methods recommended to control foliar yellowing in coconut.

It is an accepted fact that very little is added to the coconut soils, in general, in return to the heavy removal of nutrients by way of nuts, leaves, etc. The average removal of nutrients from an acre of coconut garden is estimated to be in the order of 22 kg. nitrogen, 11 kg. phosphorus, 34 kg. potash, 19 kg. magnesium and 8 kg. calcium. To make good this loss, adequate quantity of nutrients should be added to the soil. The importance of magnesia fertilisers in correcting foliar yellowing in coconut, especially the third type mentioned above, needs special emphasis. Experiments conducted at Central Plantation Crops Research Institute, Regional Station, Kayangulam as well as in Sri Lanka have clearly shown that the application of 500 gm. of magnesium sulphate per palm, along with the recommended NPK manures was very effective in reducing foliar yellowing. Spraying the foliage with two per cent magnesium sulphate solution or the application of 2.0 kg. dolomite have also been found useful in correcting foliar yellowing, due to magnesium deficiency.

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