

WHY ARE MY PALMS YELLOW ?

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THIS is perhaps the commonest question that we advisory officers are asked but it is not one which can be easily and simply answered because there are several possible causes.

A healthy coconut palm is deep green in colour and normally produces about fourteen leaves a year and about a hundred coconuts. As new leaves unfold, the oldest leaves turn yellow, dry up and ultimately fall off, but under certain conditions, the crown will show an abnormally large number of yellow leaves and this is a definite symptom that all is not well with the plant and that a reduction in crop is imminent.

A coconut palm is a food factory in which carbohydrates and other complex carbon compounds are manufactured simply from carbon dioxide, absorbed into the plant from the atmosphere, and water, drawn in through the roots. These carbohydrates (*e.g.* jaggery) are the starting point from which other compounds, such as starches, proteins, cellulose, and vegetable oils, which constitute the nut, are made.

The green colour of healthy leaves is due to a pigment, present in the cells, called "chlorophyll" and it is this compound which is able to absorb solar energy and use it to build up the carbohydrates. This energy gets locked up in the resulting products and thus we gain energy when we drink toddy or eat a coconut.

An unhealthy coconut palm with yellow leaves is seriously deficient in chlorophyll and so, is less able, to carry out the process of "photosynthesis." When a palm is yellow, the resulting nuts a year later will therefore be very few and very small. It is accordingly necessary to determine the factors responsible for the reduction of chlorophyll in the leaves and apply corrective measures, so as to restore the health of the palm.

Causes of Yellowing

Premature yellowing of coconut leaves may be due to any of the following causes :—

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| (1) Too much water. | (4) Unsuitable soils. |
| (2) Too little water. | (5) Lack of plant nutrients. |
| (3) Heavy shade. | (6) Faults in cultivation. |
| (7) Pests and diseases | |

Too Much Water

For healthy growth, a coconut palm requires at least three feet of fertile soil above the water-table or hardpan.

Low-lying areas which are liable to flooding and which cannot be drained should never be planted with coconuts. It is a complete waste of time, of good land and of planting material, as the resulting palms will never mature and will always be yellow, stunted and entirely unproductive.

When there is a hard pan of clay, cabook, limestone or slab rock near the surface, water-logging may occur during the rains unless free sub-soil drainage is possible, otherwise deep drains must be cut to release the surplus water. The soil excavated from the drains together with coconut husks should be used to raise the ground level by mounding the material round the base of each palm (see leaflet No. 5).

A hard pan near the surface can sometimes be broken up by the use of mechanical sub-soil ploughs which cut down deep into the pan but do not disturb the top soil very much. This will facilitate drainage and the colour of the palms may then be expected to improve.

Where land is liable to water-logging due to neglected drainage, a system of straight drains leading into a deep main drain, at least 3 feet deep, must be installed and these must always be kept clear of weeds, fallen fronds and silt.

Too Little Water

As water is one of the essential requirements for the production of carbohydrates it is obvious that palms will not yield well where the rainfall is insufficient or erratic or where there are no subterranean waters, unless the palms can be watered or irrigated.

Sandy, open-textured soils do not retain much moisture and are unsuitable for the cultivation of coconuts in regions subject to prolonged droughts, unless coconut husks farm-yard manure and vegetation are incorporated into the soil so as to conserve moisture (see leaflet No. 5).

Where there is a hard pan near the surface and not much topsoil, the palms will droop and turn yellow during a period of prolonged drought and subsequent crops a year later will be very seriously reduced. Here too it is necessary to conserve moisture by the regular incorporation of vegetable matter into the soil.

Palms on steep hillsides and hilltops may also suffer from lack of water and will turn yellow due to excessive run-off. To check this, attention needs to be paid to the conservation of water by means of contour drains, terracing, individual platforms and gully-plugging. Cover crops should also be grown to check the surface rush of water.

Heavy Shade

Chlorophyll is quite unable to do its work in total darkness; it can only produce carbohydrates by the help of sunlight, and leaves shut out from sunlight become pale in colour due to the reduced production of chlorophyll.

Young coconuts planted under the heavy shade of old rubber, or under close-planted, old, coconut palms will have yellowish foliage and may remain unproductive for as much as fifteen years until the palms can grow up sufficiently to reach daylight. The resulting palms therefore are thin, leggy, upstanding and low-yielders.

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It is necessary to remove the old rubber or the senile coconut palms as soon as the young under-planted palms are well-established in their planting holes. The old rubber should be completely removed before planting young coconuts; the removal of the old stand of coconut palms may be gradual but it is recommended that none of the old stand should remain in the ground five years after replanting.

Unsuitable Soils

The best type of soil for coconuts is a deep open-textured, free-working loam. The water-retentive power of gravelly and coarse sandy soils is low and as previously stated the palms will suffer and become yellow during the periods of drought. Equally, heavy clay soils, although rich in plant foods, are also unsuitable for coconuts in drought-affected areas, because during long dry spells the soil shrinks and cracks, so causing extensive root damage which thereby cuts down the supply of plant nutrients and water to the palms thereby affecting the appearance of the leaves.

Lack of Plant Nutrients

Adequate manuring with the three major elements of nutrition, viz., nitrogen, phosphorous and potash in correctly balanced proportions to suit the type of soil need hardly be stressed (see

leaflets Nos. 8, 9 and 12). The absence of or unbalanced manuring will result in reduced plant growth, gradual tapering of the stem, declining yields and unhealthy yellow foliage.

For palms to be healthy, manuring must be done regularly, either with inorganic fertilisers or with organic manures, whichever is available or most convenient to apply.

As previously stated in this Journal (Vol. 1, page 19) the element Magnesium is an important constituent of the coconut palm and also of the chlorophyll molecule. It is only to be expected therefore that a deficiency of this element in the soil will result in yellowing of the leaves ; conversely it has now been found that the application of magnesium in the form of dolomite or of epsom salts will darken and improve the foliage of young and even mature palms.

Faults in Cultivation

In estates where regular ploughing and annual harrowing is not done, the top soil becomes very hard and compact and this is particularly so in the case of clay soils which cake and become impervious to water. With sustained neglect of this sort, it is little wonder if the palms are yellow, tapering and low-yielding.

The soil should be harrowed and alternate rows ploughed once a year. This aerates the soil, incorporates green vegetation and prevents surface rooting.

Conversely an estate can be ruined, by frequent and deep ploughing. The resulting root damage will cause the foliage to turn yellow and crops will be seriously reduced in consequence. Many planters, where the sub-soil is shallow, prefer to plough in alternate rows so that the root-damage is minimised and will not affect the condition of the palms.

Pests and Diseases

Coconut Scale: *Aspidiotus Destructor*.—This pest is quite common, and it is favoured by drought conditions. Coconut scale appears as yellow patches on the upper surface of the older leaves and on the underside of each spot there is a scale insect, covered by a waxy incrustation. This pest sucks the sap from the leaf tissues so that with a large number of these insects the leaf gradually assumes a deep yellow appearance. The pests spreads from palm to palm and ultimately a large area of bright yellow palms is to be seen.

The pest is kept partly under control by a natural parasite, the lady-bird beetle, *Chilocorus nigritus* which feeds on the colonies of scale insects. The worst affected leaves should be cut off and burnt, but before burning them, the lady bird beetles should all be collected and then released into the crowns of the affected palms.

✓ **Grey Blight,** *Pestozzia palmarum*. This is a common disease, especially on very neglected coconut properties. It is characterised first by yellow spots which later become brownish, then grey and finally crack. In severe cases, the entire leaf turns yellow, the spots then coalesce and the leaf later assumes a scorched appearance and withers leaving only the mid ribs of the leaflets.

Yellowing due to this cause is sometimes quite serious because it reduces the vitality of the palms and seriously affects yields, though it generally does not kill the palm. Improving the palms by manuring and cultivation is the correct remedy. In seedlings, protection against the disease may be obtained by spraying them with a copper fungicide.

Summary

When the crown of a coconut palm is yellow it means that the palm is unhealthy due to any of seven different causes and a reduction in crop may be expected.