



Abnormal branching

Freak coconut palms

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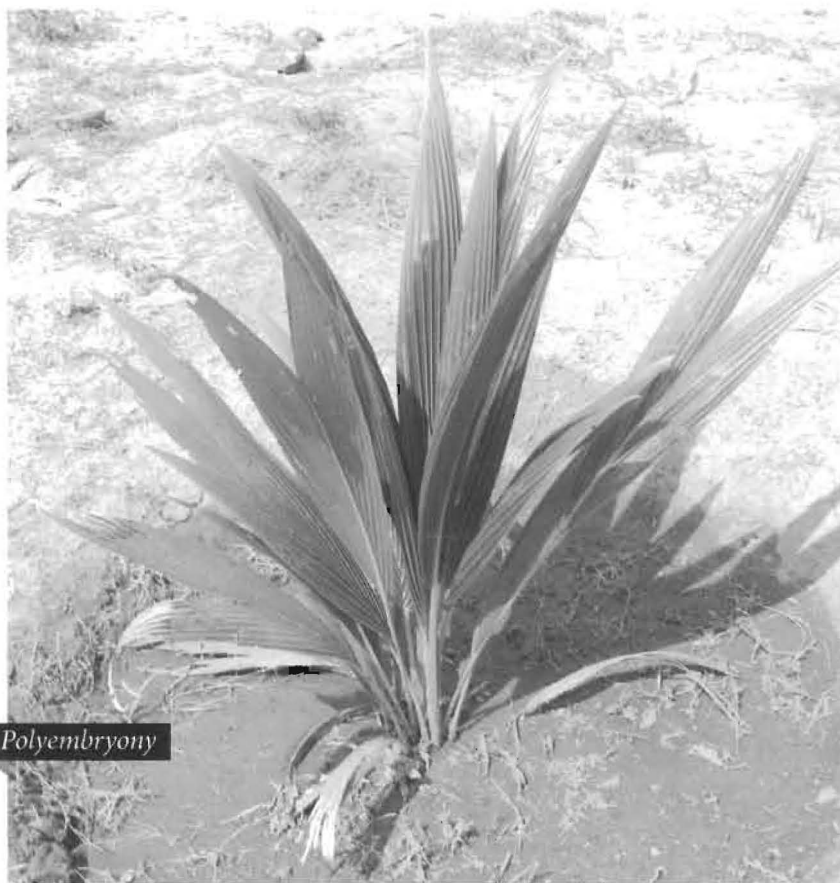
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Coconut palm (*Cocos nucifera* L) is an important plantation crop of the tropics. The palm provides food, beverage and shelter to millions of people all over the world. The coconut palms are more or less uniform for most of its morphological features like nature of stem, leaves and inflorescence. Generally the stem of coconut palm is an erect, unbranched stout cylinder which is derived from one terminal growing point. The palm has a crown of leaves at the top of the trunk. Inflorescence of coconut is termed 'spadix'. Coconut is monoecious with male and female flowers on the same inflorescence.

Occasionally rare traits of coconut are also reported from certain locations. These morphological variations observed may be due to genetic or physiological factors.

Freak is a term commonly used to refer to something strikingly unusual about its appearance or behaviour and is used to describe genetic or physiological variations or mutations. Talls and Dwarfs are the contrasting morphological forms of coconut. Many variants of morphological traits including certain abnormalities occur in coconut. Rare traits such as plicata, bispatheate (spadix covered by two spathes), spicata, secondary spikelets

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Polyembryony

and pink husked coconut have been reported in Talls. Dwarfs possess rare traits such as polyembryony, vivipary and pigment variation in leaf/nuts. These unexploited traits have lot of scope in coconut breeding programmes.

Polyembryony

In coconut, ovary is tricarpellary and corresponding to the three carpels, there are three markings, commonly known as 'eye'. Of the three eyes, usually two eyes become abortive at an early stage of development and only one attains maturity and remains comparatively soft. The viable embryo is located beneath this soft eye. Thus one nut on germination gives rise to a shoot. But rarely more than one shoot is seen emerging through a single eye. This phenomenon of producing more than one seedling from a single nut is known as polyembryony. The

multiple embryos are found clustered beneath the soft eye of the nut, but they may not share any tissue.

In polyembryonic seedlings, two

or more shoots develop from a single soft eye and grow as distinct shoots. These shoots squeeze their way out through the single soft eye, all the while maintaining themselves as separate individuals. The number of shoots that develop may be 2-4, of which one will be zygotic and others from nuclear tissues of the same ovule. There is variation in the growth and vigour of polyembryonic seedlings. Polyembryony is more frequently noticed in dwarf palms. Since dwarf palms are self pollinated, the polyembryonic seedlings are expected to be homogenous.

Polycarpy

Each carpel of a coconut fruit has an ovule inside, but usually only one seed develops out of the tricarpic ovary. In some rare cases, two or all the three 'eyes' remain soft or fertile and emerge out as separate sprout from each eye. These palms are morphologically identical and known as twin palms. Twin palms are mostly noticed in talls (WCT).

Abnormal branching

Branching is a rare phenomenon in coconut palm. Branching may take place at all growth stages and from various points of the coconut trunk.



Bulbils

the last two leaves appear at the base of the inflorescence resembling bracts which enclose the young spadix. This decreasing size of leaves and terminal inflorescence are rare occurrence among coconut palms which usually bear axillary inflorescence. In midget palm, the inflorescence is a simple spadix without a regular spathe but the two leaves/bracts found just below this terminal inflorescence serves the function of spathes.

The midget palms are usually noticed in progenies of dwarf palms. Occurrence of a diminutive seedling was earlier reported by Pavithran and Shyla (1984) and they noticed a midget seedling among 36 seedlings belonging to Chowghat Green Dwarf cultivar.

Midget palm usually dies or withers after flowering. Hence this phenomenon of early flowering in the seedling stage has no utility to the farmers as the palm dies before producing any nut. Immature flowering in midget palm may be due to some photoperiodic induction which occurs on the un split immature



leaves of the palm as these partially matured leaves are highly sensitive and capable of initiating flowering through photoperiodic response.

Fasciation of spikelets

In fasciated spikelets, the proximal end of some of the spikelets is flattened. The spikelets bear normal male and female flowers. The fasciation is not observed in all spikes of the same palms and hence it is not genetic. It may be due to the insect attack or similar injury to the spikelet which happened during the initial meristematic stage. This injury induces a rapid growth in the meristem thus enhancing the surface area.

Hermaphroditism

Coconut is normally monoecious, bearing male and female flowers separately in the same inflorescence. The male flowers are arranged at the distal end of the spikelet and female flowers at the basal portion. Occasionally some palms bear hermaphrodite flowers with both male and female flowers. The hermaphrodite flowers are located in between female and male flowers. These flowers are bigger than male flowers and smaller than female flowers. It is reported that some of the hermaphrodite flowers develop

into nuts and these nuts are smaller in size than the normal ones.

Among the coconut freaks, bulbil are more useful because bulbil producing palms are more vigorous and produce leaves simultaneously on the terminal bud. Generally the edible palm 'cabbage' is highly nutritious and rich in vitamins and minerals. People extract this nutritive rich terminal bud by destructing the palm. However in bulbiferous palms, the cabbage of the bulbil can be extracted without injuring the mother palm. Polyembony is also relevant to some extent due to the production of multiple seedlings from a single nut. Early flowering in midget palm is interesting but the seedling soon dies after flowering and hence this phenomenon has little economic significance. Different kinds of abnormal traits observed are mentioned here for the information of farmers. Since coconut is a highly heterozygous crop, most of the morphological traits noticed are highly influenced by environment. Appearance of this kind of freaks in coconut offer potential scope of genetical investigations. Hence, detailed studies are suggested for better understanding of the significance of these rare traits. ■

