COCOS, (1986) 4.35–37
Printed in Sri Lanka.

Some Observations on the Position of the Soft Eye in *Cocos nucifera*

M. R. T. WICKRAMARATNE and M. H. L. PADMASIRI
Coconut Research Institute, Lunuwila, Sri Lanka

The female flower of the coconut palm, *Cocos nucifera*, has a trimerous syncarpous ovary but the fruit usually produces only a single large seed ,the other two ovules or potential seeds abort but the three pores, characteristic of the subfamily, remain at the micropylar end or the base of the nut, marking the points of entry of the vascular supply into the three sections of the ovary. These are the *germ pores*, two of which are "blind" and distinctly harder than the "soft pore" or "soft eye" beneath which lies the single embryo (Corner 1966).

There is little or no period of dormancy as it seems that the embryo, since its inception, never ceases growing, slowly, within the seed at the expense of the endosperm. Within 12–20 weeks of fruit ripening, the seedling emerges, pushing its way out through the soft eye which is really a weak area or germination pore.

The position of the soft eye is of interest as it is believed that this affects sprouting In the Philippines it is believed that the functional eye through which the sprout emerges lies just below the ridge and that trimming the ridge and positioning the fruit in the nursery bed with the flat surface lowermost and ridge pointing upward facilitates sprouting and normal development of seedlings. (The Philippines recommends for coconut 1975). In India, horizontal planting is recommended but with the widest of the three surfaces uppermost; it is believed that this helps as the soft or germinating eye lies below this surface (Menon & Pandalai, 1958). This is in agreement with the method described by Purseglove (1972) according to which seednuts are placed in trenches horizontally with the largest of their three sides, under which is the germinating eye, uppermost. Piggott (1964) states that nuts should be placed on their side with the soft eye at the top. He goes on to say that although this eye cannot be seen through the husk, it is always opposite the narrowest side of the nut and that nuts are therefore planted with the narrow. side of the nut downwards. All these recommendations are based on the premise that sprouting is hastened if the nut is placed so that the soft eye is uppermost. However, the position of the soft eye does not appear to have been established conclusively.

The coconut fruit, though more or less spherical in shape is roughly triangular in outline (T.S) with three surfaces, each pair meeting at a ridge. One of these surfaces is clearly narrower than the other two which are more or less equal in width but with one slightly broader than the other. The broadest surface is also the flattest, as a rule. Thus, there are three ridges on the coconut fruit, one of which is opposite the broadest side and the other two each opposite a flat surface. Within the fibrous fruit wall or mesocarp of the

drupe is positioned the hard endocarp or nut which also has three ridges, alternating with the ridges of the drupe. These three ridges meet at the base of the nut dividing the nut into three more or less equal sectors and the germpores or eyes are located within the angles between them. Thus, one eye lies just below the ridge on the fruit, which is opposite the broadest side. The other two lie beneath the other two ridges and are hence closer to the broadest side. (Fig 1.)

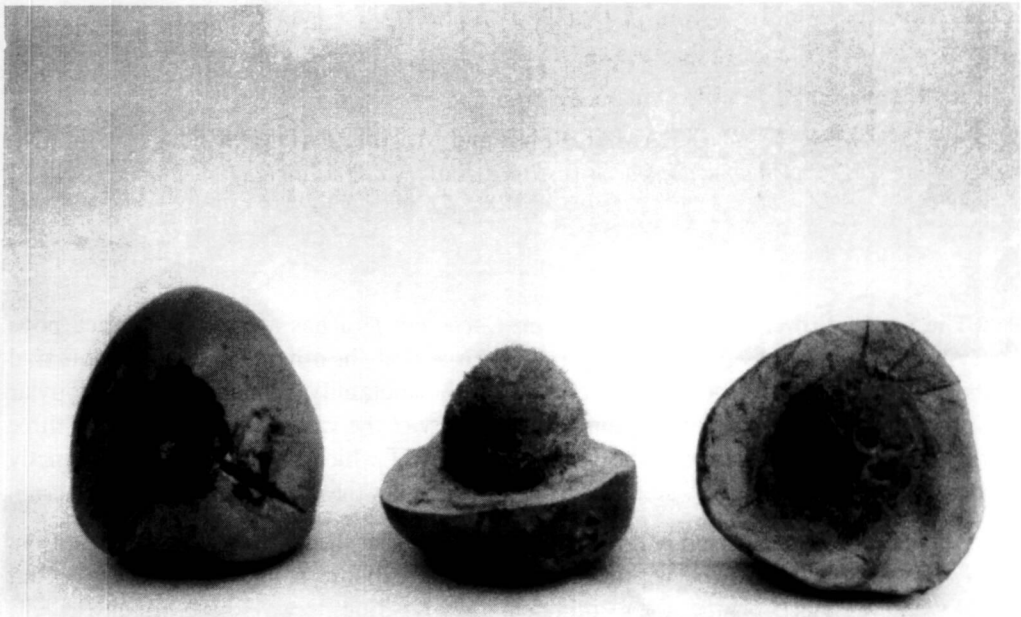

Fig 1. Coconut fruits (1) entire (2) husk removed longitudinally (3) husk removed transversely, to show surfaces, ridges and position of germ pores.

It seems possible that any one of these three eyes may develop into the soft eye, leaving the ovules beneath the other two to abort. There is, therefore, a one in three chance that the soft eye lies close to the ridge opposite the broadest side and a two in three chance that it lies nearer the broadest side. Hence there is a one in three chance (a 1:2 ratio) of the soft eye being nearer the ridge opposite the broadest side. On scoring nuts for position of the soft eye in relation to the broadest surface of the nut, out of a sample of 736 nuts, 263 had the eye just beneath the ridge opposite the broadest surface of the nut while in 473 the eye was nearer the broadest side. This ratio is not significantly different from a 1:2 ratio.

There are two possibilities regarding the best position of laying to induce early sprouting. Laying the nut with the soft eye towards the dorsal or upper side may help the sprout to emerge faster as it would be nearer the surface. On the other hand laying the nut with the soft eye closer to the lower surface may ensure that the soft eye and therefore the embryo remains in contact with the nut water for a longer period and this may enhance germination.

Since there is no method of determining whether the soft eye lies closer to the broadest surface or the ridge opposite in any particular nut while it is still intact, it is not possible to position it in the nursery such that early sprouting is facilitated. The recommendations in the different countries are conflicting and laying the nuts with a particular side lowermost

has no clear advantage and will merely increase costs. It seems best to lay the nuts horizontally, irrespective the side which is lowermost; this will increase speed of laying and reduce nursery costs considerably.

REFERENCES

Anon. (1975). *The Philippine recommends for Coconut* 1975. The Philippine Council for Agriculture and Resources Research. 63 pp.

Corner, E.J.H. (1966). *The Natural History of Palms.* Weidenfeld & Nicolson, London.

Menon, K.P.V. & Pandalai, K.M. (1958). *The Coconut Palm – a monograph.* Indian Central Coconut Committee, Ernakulam, S. India.

Piggott, C.J. (1984). *Coconut growing.* Oxford University Press, London.

Purseglove, J.W. (1972). *Tropical Crops – Monocotyledons* 2. Longman Group Ltd., London.