WEED MENACE IN OIL PALM PLANTATIONS OF KERALA

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INTRODUCTION

Oil palm is quite unique among the commercial oil producing crops with its distinctly superior yields in terms of oil and immense potential for import substitution. It is the highest oil yielding crop producing 3-6 tonnes of palm oil per hectare annually. Throughout the warm humid tropics wherein oil palm is mostly grown, growth of the natural vegetation is rapid and vigorous. Thus to prevent any competition that might limit tree growth, unwanted vegetation, proper identification and understanding of its biology and method of propagation are essential.

Under the humid tropical conditions in India, a large number of weed flora are found in oil palm plantations. These weeds compete with palms for water, nutrients and light especially in the early stages of crop growth, affecting its productivity during later years. Weeds also interfere with cultural practices of the plantation such as fertilization, pruning and harvest. Insect pests and rodents harboured by weeds can also cause severe damage to the crop.

Morphologically these weeds can be differentiated into broad leaved and narrow leaved weeds and their dominance depends upon the agroclimatological situations. Grassy weeds dominate the new plantations whereas a mixed flora is found in established plantations under humid tropical conditions of India.

Among the broad leaved weeds, Chromolaena odoratum, Elephantopus scaber, Cyclia peltata, Hedyotis sp., Borreria latifolia, Clerodendron infortunatum, Hyptis scaveolens and Synedrella nodiflora are dominant. Important grassy weeds (narrow leaved) include Cyperus spp., Imperata cylindrica, Pennisetum polysatachyon and Cynodon dactylon. Common weeds seen in the palm plantation and their method of propagation are listed in Table 1.

It is reported that if one fallen fruit per bunch is lost on a 6,000 ha plantation producing 12 tonnes of bunches/ha/year, the total loss is around 5 million CFA francs per year (Hornus et al. 1990)

IMPORTANCE OF WEEDING AROUND THE BASE OF PALMS

In oil palm, a radius of 2 metres around the base of the palm should be kept clean which is called the weeded circle". This facilitates identification of ripe bunches, since fallen fruits are clearly visible and can be picked up before and after bunches are harvested. It is reported that if one fallen fruit per bunch is lost on a 6,000 ha plantation producing 12 tonnes of bunches/ha/year, the total loss is around 5 million CFA francs per year (Hornus et al. 1990). The circle also helps in proper fertilizer application and avoids competition for water and nutrients.

WEED CONTROL METHODS

The degree of weed control that is desirable in a plantation depends upon a number of factors such as availability and cost of labour, the stage of crop growth, the degree of sophistication achieved in the management techniques, availability of herbicides etc. Different methods such as physical (cultural and mechanical) and chemical may be practiced depending on the stage of growth and nature of vegetation.

The most widely adopted cultural method of weed control is the establishment of creeping leguminous cover crops at the time of planting of oil palm in the main field. The leguminous species most commonly used are Pueraria phaseoloides, Calopogonium mucunoides, Centrosema pubescens and Mimosa invisa. Maintenance of these covers consists of cutting back the adventitious growth to 30 cm by cutlassing sometimes as many as six times a year. Rings around the palms need frequent clearing to keep the palm basin clear, so that the palms are not covered by the creepers especially the young palms. As the palms grow and shade the area, ground cutlassing can be reduced to one or two ring cutlassings depending on the growth of the cover crops.

Mechanical control measures are adopted depending on the extent of weed growth and rainfall; Hand

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TABLE 1. LIST OF COMMON WEEDS FOUND IN OIL PALM PLANTATIONS

Scientific Name	Family	Method of Propagation
a) Narrow leaved weeds :		
Alloteropsis cimcina	Poaceae	Seeds
Cympopogan flexuosa	Poaceae	Seeds
Cynodon dactylon	Poaceae	Underground stem, roots seeds.
Cyperus spp.	Cyperaceae	Seeds, underground stem
Cyrtococcum oxyphyllum	Poaceae	Seeds, runners
Digitaria adsendenes	"	Seeds, runners
Echinochloa colona	"	Seeds
Eragrostis ciliaris	"	Seeds
Eragrostis uniloides	"	Seeds
Imperata cylindrica	"	Seeds, runners
Oplisminus compositus	"	Seeds
Paspalam conjugatum	"	Seeds, runners
Pennisetum polysachyon	"	Seeds
b) Broad leaved weeeds :		
Ageratum conyzoides	Compositae	Seeds
Alysicarpus monilifer	Fabaceae	Seeds
Borreria latifolia	Rubiaceae	Seeds, roots
Chromolaena odoratum	Asteraceae	Seeds
Cyclia peltata	Menispermaceae	Suckers
Clerodendron infortunatum	Verbanaceae	Seeds, root suckers.
Desmodium pulchellus	Fabaceae	Seeds
Elephantopus scaber	Asteraceae	Seeds
Emilia sonchifolia	Asteraceae	Achenes
Euphorbia geniculata	Euphorbiaceae	Seeds
Euphorbia hirta	"	Seeds
Hedyotis sp.	Rubiaceae	Seeds
Hemidesmus indicus	Asclepiadaceae	Seeds, fleshy roots
Hyptis scaveolens	Labiatae	Seeds
Tchnocarpus frutescens	Asclepiadaceae	Seeds, runners
Justicia procumbens	Acanthaceae	Seeds, runners
Naragamia alata	Meliaceae	Seeds
Rhynchosia minima	Fabaceae	Seeds
Scoparia dulcis	Scrophuleriaceae	Seeds
Sebastiana chemileia	Euphorbiaceae	Seeds
Sida sp.	Malvaceae	Seeds
Strobilanthus sp.	Acanthaceae	Seeds, runners
Synedrella nodiflora	Asteraceae	Seeds
Theriophonum sp.	Araceae	Corms
Torenia vagens	Scrophuleraceae	Seeds
Tridax procumbens	Asteraceae	Achenes
Urena lobata	Nalvaceae	Seeds
Vernonea cineria	Asteraceae	Seeds
Zyziphus mauritiana	Rhamnaceae	Seeds

pulling and hoeing are carried out even up to 4 times in a year during the early years of the plantations which is progressively reduced to two rounds a year.

Chemical control measures are usually practiced in large plantations and wherein intercropping is not a common practice. The scarcity of agricultural manpower has led the planters to abandon the traditional method of hoeing the circles manually, in favour of chemical upkeep. Thus, weed control of larger area is possible with minimum manpower. Care must be taken in the choice of herbicide and its application to prevent the damage of young palms; also the residual effect of herbicides must be considered. It is recommended to preferably apply contact herbicides which cause localised injury to plant tissues rather than herbicides which are translocated within the plant. It is a good practice to control grasses before planting by using herbicides such as glyphosate. Since young palms are more susceptible to damage by herbicides, make sure that the leaves of palms do not come in contact with the herbicide. Leaves of young palms are moved aside with the help of hook to avoid herbicide contact while spraying. Herbicides such as 2, 4-D, 2, 4, 5-T, halogenated aliphatic acids, dalapon and TCA are found to produce abnormalities in oil palm seedlings and are to be avoided (Hartley, 1988). Thus, it is very important to use residual herbicides which are selective to the crop.

Weed Menace in Oil Palm

Hoeing alternated with herbicides is considerably more cost effective for maintaining weed free circles around established oil palm than manual hoeing alone. As palm grows and when leaves do not come in contact with herbicides, a greater number of herbicides can be used as palms are less affected.

Under Indian conditions, weed control can be achieved more effectively and with complete safety right upto the base of the young oil palm with Paraquat (Gramoxone) provided care is taken not to spray young green fronds. In mature oil palm also, this herbicide affords a quick means of cleaning harvesting paths and circles around the tree bases. For effective control, 1.0-1.5 litres of the chemical in 200 litres of water is recommended (for 2,000-3,000 sq. metres depending on the stage of weeds and their intensity). The solution has to be sprayed on actively growing weeds and if weeds are overgrown, slash them and take up spraying on regrowth 2 to 3 weeks later. Higher rate is recommended around young palms, while lower rate is used in mature palms. Application can be repeated as spot sprays at regular intervals depending on the weed growth (Dhanaraj, 1993).

While handling and spraying herbicides, workers must be advised to use protective equipments such as gloves, masks, goggles etc. and the place where spray fluid is prepared should be properly ventilated.

SUMMARY

It is noticed that when oil palm is grown under humid tropical conditions in India, it is infested with different types of broad leaved and narrow leaved weeds. The use of leguminous cover crop to prevent establishment of noxius growth in the interrow area, application of low rates of post-emergent herbicides like paraquat and the practice of intercropping can reduce unwanted weed growth during immaturity. Chemical treatments combined with a yearly manual hoeing helps to clear the circles of established palms.

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