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The Role of Insecticides in the Integrated Management of Pests of Oil Palm in Southeast Asia

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Oil Palms in Southeast Asia

Oil palms, native to West Africa, produce reddish fruitlets in bunches, weighing up to 40-50 kilograms, which are cut from the tree when ripe and taken to a mill for extraction of the oil. Trees grow to a height of 20 to 50 meters and have a productive life of up to 30 years. Oil palm produces the most oil per unit area of all the oil-bearing plants with current yield averaging between 5 and 7 tons of oil per hectare. Palm oil is used as a cooking oil; is the main ingredient for most margarine; is the base for liquid soaps, detergents and shampoos; and serves as the base for lipstick, waxes and polishes. The oil palm was imported into the Dutch East Indies in 1848 and in 1919 palm oil was exported from Sumatra for the first time. Today, the largest producers of palm oil are Indonesia and Malaysia accounting for 85% of world production. Indonesia and Malaysia each have export earnings of about $17 billion/year from palm oil. Oil palm is grown by both smallholders and plantations.

Injecting Insecticides into Oil Palms

Oil palm, being a perennial crop, is very attractive to a large number of pests. Leaf-eating caterpillars are among the most important insect pests. They include bagworms, nettle and hairy caterpillars which feed mainly on the palm fronds. High population levels can lead to the complete skeletonization and death of the fronds. A damage of 50% will cause a yield decline of around 43% over the next two years [1]. Even a lower damage such as 10-13% can also cause a similar loss. Under normal conditions caterpillars are effectively kept below the economic damage threshold by their natural enemies including predatory or parasitic insects and diseases caused by viruses and fungi. Heavy pest attack is often the result of a breakdown in the balance of nature. Generalist predators may not totally prey on the oil palm caterpillars and instead feed on other insects available in the ecosystem [2].Dust under dry conditions interferes with predators and parasites in search of hosts. Some parasitoids are commonly attacked by hyperparasitoids which reduce their numbers. As a result, parasites and predators do not fully control the caterpillar populations in all years and locations [3].

Bagworm Damage

Outbreaks of the pest caterpillars are sporadic and localized. A monitoring and surveillance system for oil palm has been used in Malaysia for many years. By monitoring an outbreak, the area in which damage is occurring is delineated. Chemical intervention is only used when populations reach threatening levels. At this stage trunk injection of a systemic insecticide is undertaken. From there, the insecticide is translocated in the sap, being carried up into the leaf tissue. This means that only the leaf-feeding caterpillars are killed, but not their natural enemies. Overall insecticide use is low, with no more than 5% of the total area of oil palms receiving application in any one year[4].Insecticide application averages about once in a planting generation (around 25 years).In many instances, small holders do not regularly manage the caterpillar populations with trunk injections and serious uncontrolled outbreaks occur [1][2].

References

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