RAMA UNIVERSITY

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FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

ENT-121: Fundamentals of Entomology

Lecture 25: Insecticide act and Recent Methods in Pest Management:

Host Plant Resistance:

One IPM strategy is to grow crop varieties that are resistant to pest damage. Crop varieties that are resistant to pest damage are said to have host plant resistance. Host plant resistance can be broken down into three categories: non-preference, antibiosis, and tolerance.

Non-preference (antixenosis): Host plants that express non-preference affect the way an insect pest perceives the desirability of the host plant. Non-preference plants either provide stimuli that are unattractive to the pest (color, odor, texture such as downy hairs) or fail to provide stimuli that are attractive to the pest. In this way, non-preference plants affect the behavior of pests.

Antibiosis: Antibiosis is a type of resistance in which the host plant causes injury, death, reduced longevity, or reduced reproduction of the pest. Often both a resistant and susceptible variety will have the same basic response to a pest, but the resistant variety will respond more quickly or more dramatically than the susceptible variety, reducing the amount of damage the pest causes. Plants that express antibiosis affect the biology of pests.

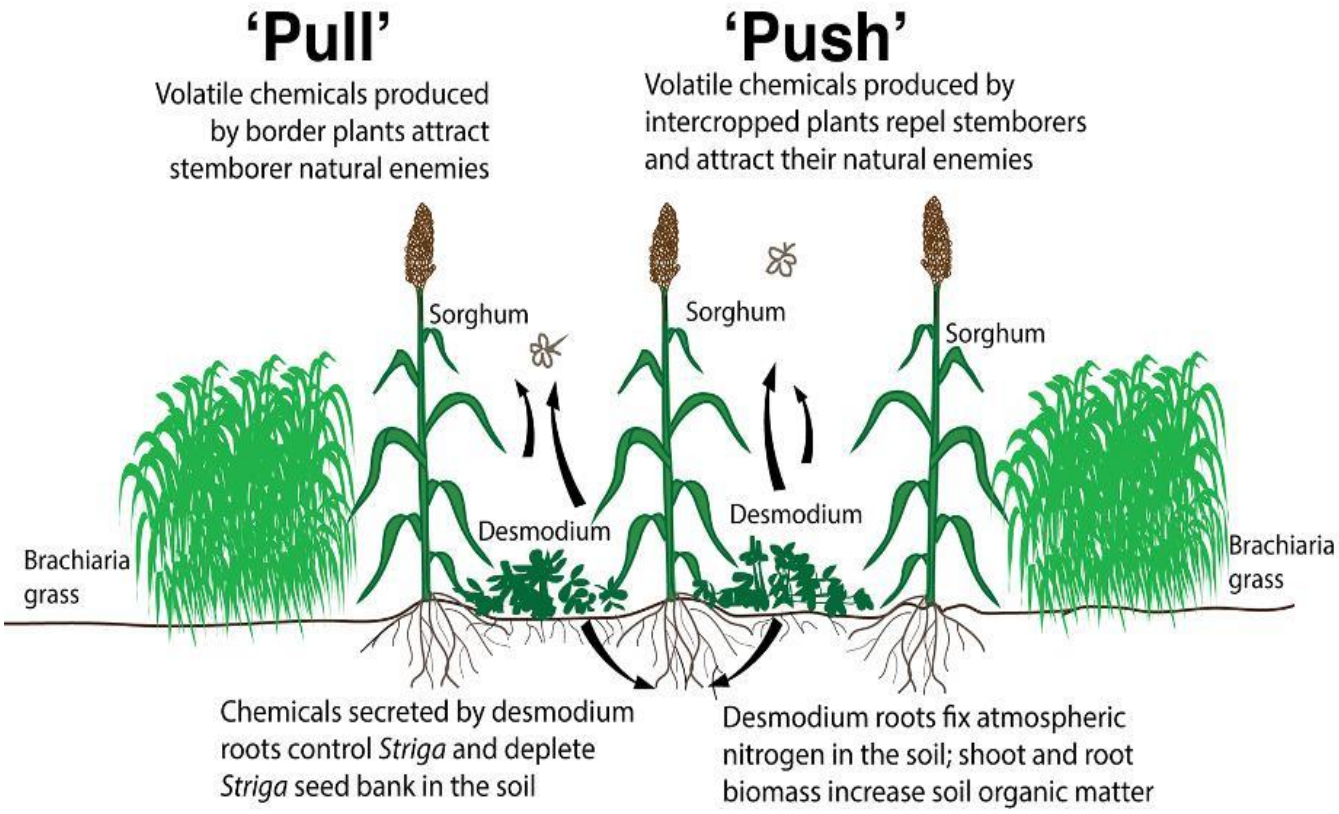
Tolerance: Host plants that express tolerance are resistant to pest damage because they can remain healthy and yield well despite the damage. These plants must also be able to heal wounds and fight diseases that enter through wounds.

Push and Pull Strategy:

Push pull strategy of integrated pest management in agriculture involves the behavioral manipulations of insect pests and their natural enemies by the use of behavior modifying stimuli which makes the main crop comparatively unattractive and unpalatable to the pests while diverting them to the more attractive sources from where they are removed. Continuous injudicious application of long persistent broad spectrum pesticides for pest control, essentially debilitate the beneficial natural enemies, essential pollinators and foragers, thereby enter into vertebrate food chain resulting into bio-magnification. These result into secondary pest outbreak and development of pesticide resistance in insect pests and emergence of pest biotypes. Push pull strategy of integrated pest management is a newly emerged pest control method which uses non-toxic components for pest population reduction with reduced pesticide input. The Push pull effect is established by the use of exploiting semiochemicals which deter the pests from the main crop (“push”) and attract them into trap crops (“pull”). Intercropping or companion cropping is done for semiochemicals delivery which mask host stimuli and act as a repellent and deterrent. However, the Push-pull method has a number of advantages in agriculture. Companion crops and intercrops usually serve as a good fodder for the farm animals, while leguminous intercrops add adequate organic matter and nitrogen to the soil by nitrogen fixation. A good number of trap crops help with the water retention and bind the soil particles, thus prevent soil erosion and nutrient leaching. The major benefit is that certain intercrops and trap crops used in this strategy

may also help in the control of weeds by dramatic reduction of the weed seed bank in the soil due to allelopathic effect. Thus Push pull strategy could be a useful method in Integrated pest management programme to increase agricultural productivity.

Other Strategies: Use of Antecedents, Genetic Control and Growth regulators



Insecticide Act 1968:

Based on the recommendations of the Expert Committee a comprehensive Insecticides Act was passed in 1968 to regulate the import, manufacture, sale, transport, distribution and use of insecticides • The enforcement of Act was transferred to the Ministry of Agriculture in the year 1970. An Act to regulate the import, manufactures, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, and for matters connected therewith.

Parts and Authorities:

1. The Central Insecticides Board
2. Registration Committee