

CULTURAL CONTROL OF INSECT PESTS

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INTRODUCTION

Cultural control is using the production or utilization methods of a commodity with a concern for insect management. Cultural control practices are usually multipurpose technical procedures that create environments that either avoid high-risk situations for infestations or develop unfavorable conditions for pests. Cultural controls are not usually intended to suppress insect outbreaks, but are designed to prevent infestations from developing. These control methods are usually inexpensive because they are generally necessary for producing or using a commodity often with pest management as a secondary priority. Designing and implementing cultural control in IPM programs may call for greater professional competence, because greater knowledge of insect biology and behavior is usually required as compared to other insect management methods. It follow the following method...

CLEAN CULTIVATION

In this method of soil management the space between plants is kept clean by tillage and removal of weeds.

Advantages

1. Removes competition of weeds for light, water and nutrients from crop and avoidance of alternate host for pests and diseases.
2. Improves soil physical condition through better aeration by breaking clods.
3. Helps in breaking hard top and abstractions in the infiltration of water.
4. Improves soil biological activities through better aeration.

Disadvantages

1. Loss of organic matter.
2. Loss of soil through erosion even on flat lands through water and wind.
3. Loss of nutrient through excessive leaching.
4. Injury to roots and creation of entry points for pathogens.



CROP ROTATION

is the practice of growing a series of dissimilar or different types of crops in the same area in sequenced seasons. It is done so that the soil of farms is not used for only one set of nutrients. It helps in reducing soil erosion and increases soil fertility and crop yield.

Growing the same crop in the same place for many years gradually depletes the soil of certain nutrients. With rotation, a crop that leaches the soil of one kind of nutrient is followed during the next growing season by a dissimilar crop that returns that nutrient to the soil or draws a different ratio of nutrients. In addition, crop rotation mitigates the buildup of pathogens and pests that often occurs when one species is continuously cropped, and can also improve soil structure and fertility by increasing biomass from varied root structures.



TILLAGE

Tillage is the agricultural preparation of soil by mechanical agitation of various types, such as digging, stirring, and overturning. Examples of human –powered tilling methods using hand tools include shoveling, picking, mattock, hoeing and raking. Examples of draft-animal powered or mechanized work include ploughing (overturning with moldboards or chiseling with chisel shanks), rototilling, rolling with cultipackers or other rollers, harrowing, and cultivating with cultivator shanks (teeth). Small-scale gardening and farming, for household food production or small business production, tends to use the smaller-scale methods, whereas medium- to large-scale farming tends to use the larger-scale methods.



USE OF RESISTANT VARIETIES

Insect-resistant crop varieties suppress insect pest abundance or elevate the damage tolerance level of the plants. In other words, insect-resistant plants alter the relationship an insect pest has with its plant host. How the relationship between the insect and plant is affected depends on the kind of resistance, e.g. antibiosis, antixenosis (non-preference), or tolerance.

Antibiosis resistance affects the biology of the insect so pest abundance and subsequent damage is reduced compared to that which would have occurred if the insect was on a susceptible crop variety. Antibiosis resistance often results in increased mortality or reduced longevity and reproduction of the insect.

Antixenosis resistance affects the behavior of an insect pest and usually is expressed as non-preference of the insect for a resistant plant compared with a susceptible plant.

Tolerance is resistance in which a plant is able to withstand or recover from damage caused by insect pest abundance equal to that damaging a plant without resistance characters (susceptible). Tolerance is a plant response to an insect pest.



THINNING AND PRUNING

Thinning is a term used in agricultural sciences to mean the removal of some plants, or parts of plants, to make room for the growth of others but does not involve the cutting of the whole tree. Selective removal of parts of a plant such as branches, buds, or roots is typically known as pruning. Reasons to prune plants include deadwood removal, shaping (by controlling or redirecting growth), improving or sustaining health, reducing risk from falling branches, preparing nursery specimens for transplanting and both harvesting and increasing the yield or quality of flowers and fruits.



FERTILIZING AND STIMULATING VIGOROUS GROWTH

Plants use more nitrogen than any other nutrient when they are growing. Nitrogen regulates the growth of stems and leafy green foliage. Feeding your plants with a fertilizer high in nitrogen promotes rapid and vigorous growth including those exhibiting pale green, undersized leaves and reduced growth rates and those in declining condition (e.g. dead branch tips, dieback) resulting from insect attacks or disease problems.



USE OF CLEAN SEEDS

Good seed is pure (of the chosen variety), full and uniform in size, viable (more than 80% germination with good seedling vigor), and free of weed seeds, seed-borne diseases, pathogens, insects or other matter. Seed should be properly labeled.

Obtaining good seed

Buy certified seed that is pure and labeled,
get farmer-produced good seed
select your own good seed.

Winnowing to get good seed

Harvested seed includes seed of varying sizes and non-seed matter (e.g., weeds and trash). Full plump (heavier) seed can be selected by winnowing with natural wind or an electric fan. Repeat winnowing, if necessary. Select heavier seed closer to the side from which the wind blows. This procedure will also remove lighter weed seed and non-seed matter.

Drying and storing good seed

After harvest, clean seed and select full and uniform seed. Dry seed to 12–14% moisture content. Store the seed in sealed airtight containers until ready for planting (seed is good for up to one year if stored properly).



REGULATING IRRIGATION

Irrigation is the process of applying water to the crops artificially to fulfil their water requirements. Nutrients may also be applied to the crops through irrigation. The various sources of water for irrigation are wells, ponds, lakes, canals, tube-wells, and even dams. Irrigation offers moisture required for growth and development, germination, and other related functions.

Water moistens the soil and thus helps in penetration of roots even into the dry field. The frequency, rate, amount and time of irrigation are different for different crops and also vary according to the types of soil and seasons. For example, summer crops require a higher rate of water as compared to winter crops.

Types of irrigation:- Surface Irrigation, Localized Irrigation, Sprinkler Irrigation, Drip Irrigation, Centre Pivot Irrigation, Sub Irrigation, Manual Irrigation, sprinkler system, Drip System.



VARIATION IN SOWING AND HARVESTING TIME

A careful adjustment in the sowing period of crop influences the attack of insect pests. Most of the insects lay their eggs during certain confined phase if host plant are available. By adjusting the owing time farmers can avoid the egg laying phase of particular insect pest. The crops which are attacked at the time of maturation, can be saved by adjusting the harvesting time before the normal period. The early maturation of crops can be achieved by giving proper fertilizer, irrigation or by choosing the early varieties of crops.



MIXED CROPPING

Mixed cropping, also known as polyculture, inter-cropping, or co-cultivation, is a type of agriculture that involves planting two or more plants simultaneously in the same field, interdigitating the crops—like interlocking your fingers—so that they grow together. Since crops ripen during different seasons, planting more than one saves space and also provides a wealth of environmental benefits including maintaining a balance of input and outgo of soil nutrients; weed, disease, insect pest suppression; resistance to climate extremes (wet, dry, hot, cold); an increase in overall productivity, and management of scarce land resources to its maximum potential.



Simplicity and low cost are the primary advantages of cultural control tactics, and disadvantages are few as long as these tactics are compatible with a farmer's other management objectives (high yields, mechanization, etc.)

THANK YOU

Stay home, stay safe.....