General Concepts in Integrated Disease Management

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The Small Farms Research Center at Alabama A & M University (AAMU) was first conceived in 2000 with funding from USDA’s Office of Outreach authorized under section 2501 of the 1990 Farm Bill. The mission of the center and the Small Farmers Outreach and Technical Assistance Program is to assist all small and limited resources farmers effectively dealing with agricultural risk, food safety, and overall farm management issues.

Thus, the Small Farms Research Center was initiated in 2000 to conduct research and provide services throughout Alabama, with special and particular outreach emphasis on 21 underserved counties in north Alabama.

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Identifying and monitoring pathogens: It is important step in integrated disease management. Monitoring are of two kinds one is direct (closely looking for pathogen or disease) indirect (observing and recording environmental conditions that can host and develops disease).

Direct monitoring is practiced by checking at the places that are closer to the ground or areas with lush growth. There is other way of identifying symptoms and diseases; in which the entire field is divided into many sections and each section has to be monitored every week. In general, soil borne diseases appears in clusters whereas seed borne diseases symptoms are evenly distributed. If disease is caused by pests then the symptoms appears on particular plants that are susceptible to plants.

Indirect disease monitoring requires computer for data analysis. This data include relative humidity in air, temperature, and leaf wetness. In few cases this kind of disease monitoring is successful but it requires a lot of equipment to achieve those results.

References:

Plant Disease Management for Vegetable Production in California by University of California.

Integrated Disease Management for Crops by University of Nevada.

Plant Disease Management by Otis C. Maloy Department of
planting dates and drip irrigation. Unfavorable conditions like poorly drained soils, inadequate spacing and excessive amount of water can increase the plant susceptibility.

Some management methods that are used for disease prevention

Site selection and Land preparation: A clean soil produces healthy crop therefore it is important to start a farm with clean. Land with plowing and disking operations reduces pathogen population from the old crop. The pathogen population decreased with increase of fallow period. Soil compacts interfere with root diseases, so it has to be eliminated. Planting dates can be altered to avoid or reduce pathogen attack.

Irrigation management: Soils with high moisture content increases the development of soil borne pathogens. The amount and time of irrigation depends upon type and different stages of the crop.

Soil health and nutrient management: soils with low pH (acidic) are highly prone to fungi. To prevent this infection, soils are limed with calcium carbonate or gypsum. A good amount of calcium and high soil pH can decrease fungi and bacterial population in the field. In case of vegetable crops excessive nitrogen leads to dense canopy and blocks the lower part of crop for

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INTEGRATED DISEASE MANAGEMENT

Integrated disease management is a disease control method that uses all types of management to keep disease pressure below the economic threshold level. This management does not include routine chemical application to prevent disease, but promotes biological, cultural, physical and mechanical control practices. Treating with chemicals does not eliminate the real problem and also leads to potential damage to the environment.

**Basic objectives** that has to be achieved through integrated disease management are:

- Reduce the introduction of disease into the crop.
- Avoid conditions that are suitable for disease establishment and their spread.

A good IDM consists following six main principles:

**Exclusion**: This principle includes preventing the introduction of a disease causing agent into the farm.

**Avoidance**: This principle includes avoiding situations that promote disease development.

**Resistance**: This principle includes selecting plants that posses ability to remain healthy even if the plant is infected.

**Prevention**: This principle includes disease management tactics that are applied before infection.

**Therapy**: This principle includes disease control methods that are applied after the plant is infected.

**Some of the above principles can be achieved**:

*Exclusion* principle can be practiced by producing pathogen free seeds or planting stock through certification programs for seeds and vegetative propagated plant materials such as potatoes, grapes tree fruits etc. This principle include isolation of production areas, field inspections, and removal of suspect plants from field.

*Eradication* principle can be practiced by pruning infected areas of fruit and nut trees. In some cases destruction of entire trees is recommended. This principle is accomplished by destroying weeds that serves as reservoirs of various pathogens or vectors. Soil fumigation process involves gas forming chemicals such as carbon disulfide, methyl bromide, or chloropicrin into soil to kill target pathogens. Crop rotation is common used strategy to reduce the pathogen population.

*Resistance* principle can be practiced by growing resistant plant varieties. Plants that are selected with resistant varieties.