International Journal of Enhanced Research in Science, Technology & Engineering
ISSN: 2319-7463, Vol. 4 Issue 9, September-2015, pp: (277-278)

Principles of Controlling Plant Diseases

Dr. Archana Karnawat

Dept. of Botany, Raj Rishi Govt. College, Alwar, (Raj.)

INTRODUCTION

Plants also suffer from diseases, just like humans. These ailments if not cured at the right time may lead to spreading of the infection, poor growth of plant or also death of the plant. The goal of plant disease management is to reduce the economic and aesthetic damage caused by plant diseases. The diseases vary depending on circumstances of the crop, its location, disease severity, regulations and other factors. Plant disease management practices rely on anticipating occurrence of infection and making the use of weak points to identify the disease. Therefore, correct diagnosis of a disease is necessary to identify the pathogen, which is the real target of any disease management program. Hence, a good understanding of the disease including climatic and other environmental factors that influence the cycle, and cultural requirements of the host plant, are essential for effective management of any disease.

PRINCIPLES

Just like any other disease management system, it also has two main principles – prevention and cure. Prevention means to apply techniques so that plant does not get an infection while cure means to help plant heal from the damage already caused by the pathogen. For prevention, we can keep the plant away from surroundings that may cause an infection. For curing the disease that is already caused, we can expose the plants to chemicals or heat so that the virus gets killed.

Then there are other management techniques as well. First is exclusion. These are measures taken to prevent the introduction of a disease-causing agent into a plant or any region. The basic strategy assumes that most pathogens can travel only short distances without the aid of some other agent such as humans or other vector, and that natural barriers like oceans, deserts, and mountains create obstacles to their natural spread. In many cases pathogens are moved with their host plants or even on nonhost material such as soil, packing material or shipping containers. Unfortunately, exclusion measures usually only delay the entry of a pathogen, although exclusion may provide time to plan how to manage the pathogen when it ultimately arrives.

The next is eradication. This principle aims at eliminating a pathogen after it is introduced into an area but before it has become well established or widely spread. It can be applied to individual plants, seed lots, fields or regions but generally is not effective over large geographic areas. It can be accomplished by plucking out weeds, removing and abandoning infested soil. Soil fumigation has also been a widely used eradication strategy. This technology involves introducing gas-forming chemicals such as carbon disulfide, methyl bromide, or chloropicrin into soil to kill target pathogens. Crop rotation is also a technique used in eradication of ailments.

Protection is yet another plant disease management. This principle depends on establishing a barrier between the pathogen and the host plant or the susceptible part of the host plant. It is usually thought of as a chemical barrier, e.g., a fungicide, bactericide or nematicide, but it can also be a physical, spatial, or temporal barrier. The specific strategies employed assume that pathogens are present and that infection will occur without the intervention of protective measures. Protection often involves some cultural practice that modifies the environment, such as tillage, drainage, irrigation, or altering soil pH. It may also involve changing date or depth of seeding, plant spacing, pruning and thinning, or other practices that allow plants to escape infection or reduce severity of disease. Usage of pesticides and fungicides also comes under protection. These can be sprayed over plants to eradicate the pathogens.

Resistance is also a management technique. Use of disease-resistant plants is the ideal method to manage plant diseases, if plants of satisfactory quality and adapted to the growing region with adequate levels of durable resistance are available. The use of disease-resistant plants eliminates the need for additional efforts to reduce disease losses unless other diseases are additionally present. Resistant plants are usually derived by standard breeding procedures of selection and/or hybridization. Selection of resistant plants involves subjecting plants to high levels of disease pressure and using the surviving plants as sources of disease resistance. Plants that survive this pressure often have genetic resistance that can be utilized directly by propagation or as sources of resistance to develop resistant plants that also have the requisite qualities for that crop. Hybridization is a tactic where a plant having the desired agronomic or

horticultural qualities, but is susceptible to a disease, is crossed with a plant that is resistant but which may or may not have the other desirable characteristics such as size, yield, flavor, aesthetics, etc.

CONCLUSION

Hence, disease management techniques should be used to help free the plant from any ill-health or to protect it from further damage. Also, activities like site selection and preparation, utilizing resistant cultivars, altering planting practices, modifying the environment by drainage, irrigation, pruning, thinning, shading, etc., and applying pesticides, if necessary should be encouraged. But in addition to these traditional measures, monitoring environmental factors (temperature, moisture, soil pH, nutrients, etc.), disease forecasting, and establishing economic thresholds are important to the management scheme. These measures should be applied in a coordinated integrated and harmonized manner to maximize the benefits of each component.

.