

Disease Management by Organic Farming

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Organic farming is a practice of the cultivation of crops and rearing of animals without the use of any synthetic chemical inputs such as fertilizer and pesticides, but by the use of green manure, crop rotation, compost and other cultural practices. Organic farming is “a production system, which avoids or largely excludes the use of inorganic fertilizers, pesticides, growth regulators and livestock feed additives.” (Lampkin, 1990). “Organic” Foods produced without hormones, antibiotics, herbicides, insecticides, chemical fertilizers, genetic modification or germ-killing radiation. Such foods labeled as “Certified Organic”.



Why organic farming is necessary?

With the development of high yielding varieties blended with improved specified inputs such as insecticide, fungicide, fertilizers, irrigation etc., lead to environmental problems.

The soils become sick mainly due to the exploitation through:

- Use of selected and highly pure fertilizers.
- Use of irrigation water without proper drainage.
- Making use of poor quality waters.
- Discharging hazardous, industrial toxic effluents into the natural water sources.

Objectives of organic farming

- High nutritional quality of produce.
- Work with natural system as opposed to trying to control them.
- Encourage and enhance the biological cycles through the use of framing systems.
- Maintain and enhancing the longterm fertility of the soil.
- keeping the agricultural system with regard to organic matter and nutrient elements.
- To give all livestock, conditions of life allow them to perform all aspect of their innate behavior.
- avoiding pollution in all its forms.
- To maintain the genetic diversity in agricultural system.
- Allow agricultural producers an adequate return and satisfaction from their work including a safe working environment.
- To consider the wider social and ecological impact of the farming system.

Advantages of organic farming

- Research shows that organic farming yields more profits than conventional farming practices.
- Organic farming reduces the production cost by about 25-30%.
- Organic farming preserves soil by reducing soil erosion.
- Farmers can utilize the soil for a longer amount of time when they practice organic farming.
- Organic farming has a positive effect on the ecosystem.
- The original nutritional content of food is preserved.
- Organic products moreover are tastier than the products yielded from traditional farming.
- Consumption of products obtained from organic farming reduces the chance of developing bodily illnesses like cancer and heart attacks.
- Organic farming maintains the physical properties, biological activity of soil thus maintaining soil fertility.
- Organic farming neither contain any sort of artificial flavours or preservatives nor do they contain any harmful chemicals.

Components in organic farming in Plant disease management

• Use of resistance varieties

Use of resistance varieties is a simplest and cheapest method of plant disease control. Please use resistance varieties of field crops.

• Follow cultural practices

- Use of certified seeds
 - Crop rotation
 - Field sanitation
 - Rouging
 - Deep summer ploughing
 - Proper irrigation
 - Proper drainage
 - Follow proper time of sowing
 - Ideal nutrient management
 - Green manuring
 - Use of Plant extracts
 - Clove (garlic) and leaf extract of several botanicals are also beneficial in plant disease management.
 - They used as seed treatment and foliar spray.
 - Use of plant extracts not only economically sound but also ecofriendly.
 - But they have not longtime effect like fungicides and bioagents.
 - Various diseases such as Stem rot of mustard, Alternaria blight of coriander, Alternaria blight of mustard, Powdery mildew of fenugreek are controlled by spray and seed treatment with plant extracts.
- ### • Use of Bioagents
- Bio-control is control of pathogen by using other living organisms. Various bioagents are used for managing plant diseases. *Trichoderma sp.*, *Gliocladium virens*, *Pseudomonas fluorescens* etc. are useful for managing soil borne diseases.
 - PGPR (Plant Growth Promoting Rhizobacteria) not only manage the diseases but also increase resistance in plants.

Why biological control is necessary?

Chemical pesticides:

- Chemical pesticides having residual problem.
- Implicated in environment and human health problems.
- Require yearly treatments and expensive.
- Toxic to both beneficial and pathogenic species.

Advantage biocontrol agent:

- Avoid environmental pollution.
- Avoid adverse effect on beneficial organisms.
- Less expensive than pesticides and avoids problems of resistance.
- BCAs are self-maintaining in simple application and fungicide needs repeated applications.
- BCAs are very effective for soil borne pathogens where fungicide approach is not feasible.
- BCAs are eco-friendly, durable, long lasting.
- BCAs helped in induced systemic resistance among the crop species.
- Not a water contaminant concern.

Limitations or disadvantages:

- Major difficulties in the application of BCAs in getting them to the right place at the right time in sufficient density to be effective and then maintaining them there.
- Other difficulty is the apprehension of the growers about the efficacy of BCAs.
- Slow process, so complete control is not achieved.
- Require trained man power.
- Host specific.
- Very slow action.
- Effected by environment and ecology.

Mode of action of bioagents

- Antagonism
- Hypo-virulence
- Antibiosis
- Cross protection

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Organic management of blight in cumin

- Seed treatment with *Trichoderma viride* @ 4g/kg seed with three sprays of Propiconazole (Tilt) @ 1 ml/lit water at fortnightly interval after 35 DAS for the control of blight disease of cumin.
- Soil application of *Trichoderma viride* @ 2.5kg + FYM @100 kg + seed treatment with carbendazim @ 1g/kg seed along with spray of score @0.05% was found effective against cumin wilt and blight.

Organic management powdery mildew and aphid in fenugreek

- Soil application of Neem cake 2 t/ ha + soil application of *Trichoderma viride* 2.5 kg/ ha and spray of NSKE 5% at 10 days interval (twice/thrice) was found effective in organic management of powdery mildew and aphid in fenugreek.

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