INTEGRATED MANAGEMENT OF PYRETHRUM DISEASES

KALRO
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NAVCDP
NATIONAL AGRICULTURAL VALUE CHAIN DEVELOPMENT PROJECT

Introduction

The diseases that affect pyrethrum crop and their management are described below. The first step in disease management is to prevent the disease from occurring. After planting, a crop a farmer is advised to frequently monitor the crop and carry out scouting while looking out for key symptoms or manifestation of the diseases. Once a disease is detected, one should take action immediately by employing a combination of methods such as cultural practices, biological or chemical control measures. Chemical control should be the last resort that a farmer should employ to manage diseases.

Fusarium wilt

Fusarium wilt is a disease caused by the fungal pathogen known as Fusarium oxysporum. The fungus is found in the soil and can remain there indefinitely. The pathogen is disseminated by seedlings/splits and soil.

The disease is a big problem in low-altitude areas where the temperatures are relatively high, between 25 and 32°C and in acidic soils that are sandy and light in texture.

Symptoms (how an infected plant appears)

- Yellowing of lower leaves, starting with the leaf margins.
- Plant wilts, becomes stunted and dries.
- Death of the root system, which can spread to the crown.
- Cross-section of infected stem shows pale yellow, red or black colouration.

Various stages of Fusarium wilt (Photos from Collins Kentegra)

Vascular discoloration (Photos from Collins Kentegra)

Management

Cultural practices

- Incorporate animal manure in the soil on the basis of soil tests so as to increase soil pH to about 6.5 since the pathogen thrives in low-pH soils.
- Avoid planting in infected fields
- Plant disease free seedlings from a certified nursery
- Avoid runoff into pyrethrum fields.
- Practise crop rotation for 4 to 7 years but avoid rotating with peppers, eggplant, Irish potatoes, sunflower.
- Disinfect farm implements and footwear (e.g. pangas, jembes, ploughs, gumboots) in a commercial bleach solution before using in pyrethrum crop fields; for instance, Jik dilution of 500 ml in 10 litres of water.
- Scout the pyrethrum for plants that exhibit disease symptoms; uproot and destroy (e.g. by burning) such plants.
- Remove all crop debris after harvest and destroy by burning or burying 90cm deep.
- Keep the field weed-free and avoid injuring the plants while weeding to prevent pathogen entry.

Chemical control

- Dip seedlings/splits in a copper-based fungicide solution before planting.
- Drench soil in a suspected nursery bed with Trichoderma-based biopesticide such as Rootgard, Trianum–P 11.5 WP, Trichotech, or Mazao Sustain.
- Drench nursery beds or dip planting materials in Carbendazim-based fungicides

such as Goldazim 500 SP at 20mls/20litres of water, Pearl 500 SC at 20mls/20litres of water and Pearl Extra 50%EC at 20ml/20litres of water

- Use Propamocarb based products such as Previcur N.

Crown Rot / root rot Disease

Crown rot (also known as root rot) is a disease of pyrethrum caused by a number of fungal pathogens including Fusarium spp., Rhizoctonia spp. Sclerotinia minor and Ascochyta spp.

It can result to yield loss of 30- 60%. The fungi remain in pyrethrum stalks, which become a source of infections in subsequent seasons.

Symptoms (the disease manifests in infected plants)

- Initially, dark brown necrotic lesions appear on roots and basal parts of the plant.
- The lesions later turn into root rot. The plant wilts leading to premature death.

Crown rot
(source Collins, Mica Kentegra)

Root rot (source Collins, Mica Kentegra)

Management

Cultural practices

- Plant certified seedlings or splits
- Practise crop rotation with legumes for at 2-3 seasons
- Avoid overhead irrigation to reduce splash of the pathogen to healthy plants
- Uproot and destroy severely affected plants & bury deep or burn them.

Chemical control

- Use carbendazim- or azoxystrobin-based products

e.g. Bendazim and Ortiva according to the manufacturers' recommendations.

Flower blight/ray blight

Flower blight (also known as Ray blight) is a destructive disease in pyrethrum caused by several fungi, including Sclerotinia sclerotiorum, Phoma spp., Alternaria spp., and Botrytis cinerea. The disease attacks the ray florets of the flower stopping it from graduating from one stage to the other. It is severe in cold and misty weather conditions.

Symptoms (how the disease manifests)

- Necrotic lesions start on leaf margins, then expand and cover the whole leaf resulting in defoliation and stunted growth of the plant.
- Leaf lesions spread to the petiole and flower stem, resulting in flower stem girdling.
- Yellowing and deformation of leaves also appear.
- The most distinct symptom is the 'shepherd's crook' appearance of flower buds, which is caused by infection and necrosis of one side of the upper flower stem (2–3 cm below the flower bud), resulting in drooping of the flower bud.

Infected flower stems showing 'Shepherd's crook' symptom

Flower affected by Flower blight/ray blight

Management:

Cultural practices

- Plant certified seedlings or splits,
- Practise crop rotation with non-legume crops for 3-4 seasons

- Uproot and destroy infected plants/volunteers by burying or burning
- Disinfect farm tools in commercial bleach (e.g. Jik) solution (50ml/litre) and avoid working in wet fields.

Chemical control

Spray with carbendazim-based products such as Rodazim SC, Bendazim, Sherrif, and Propamocarb hydrochloride products such as Previcur N according to the manufacturers' recommendations.

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