MAURITIUS SUGAR INDUSTRY RESEARCH INSTITUTE

Recommendation Sheet

May 2011, No. 178

MANAGEMENT OF POTATO PESTS

The main pests of potato are leaf miners (*Liriomyza* spp.), leaf eating caterpillars (*Helicoverpa armigera* and *Spodoptera littoralis*), thrips (*Thrips palmi*), cutworms (*Agrotis ypsilon*), aphids (*Myzus persicae*, *Macrosiphum euphorbiae*, *Aulacorthum solani*, and *Aphis gossypii*), mites (*Polyphagotarsonemus latus* and *Tetranychus urticae*) and potato tuber moth (*Phthorimaea operculella*).

An integrated pest management (IPM) approach which combines cultural practices, field scouting and timely application of selective pesticides will enable a sound management of these pests. Prophylactic use of pesticides is not recommended in order to preserve natural enemies.

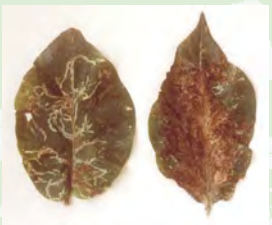
Leaf miners

Two species namely *Liriomyza trifolii* and *Liriomyza huidobrensis* are concerned.

Adults, about 2 mm long, are black flies, with a yellow dot on upper thorax

Leaves are punctured for feeding and for oviposition. Punctures appear as tiny dots or as holes which may reach up to 5 mm

These punctures are good indicators of the presence of adults in a field.



Larvae are legless, yellowish maggots and they tunnel through the leaf tissues, creating mines

Pupa on leaf

Recommended management practices

- Adopt proper weed management. Leaf miners are highly polyphagous, feeding on many weed species (e.g. *Solanum nigrum*) and other crops (e.g. tomato, bean).
- Apply recommended rates of nitrogen fertilization. Excessive application renders plants more susceptible to damage by this pest.
- Perform regular scouting of fields to monitor presence of flies and /or young mines.
- In parallel, use yellow sticky traps to monitor adult populations.
- If possible, use yellow sticky boards mounted on tractors for mass trapping of adults.

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Recommendations for chemical control

- At 30 – 35 days after planting, if adults are found in sufficient numbers as evidenced by the presence of feeding punctures (at least 10 per leaflet) and/or presence of very young mines (less than 2 mm long), apply

	Rate / ha	Rate / arp
PATRON (cyromazine) 75 WP + COMPLEMENT S	***142 g+ 250 ml***	***60 g + 105 ml***

- If mines are advanced, apply any one of the followings :

	Rate / ha	Rate / arp
CORAGEN (chlorantraniliprole) 20 SC + COMPLEMENT S	***300 ml + 250 ml***	***125 ml + 105 ml***
TRACER (spinosad) 48 SC + CODACIDE OIL	***300 ml + 1.4 L***	***125 ml + 590 ml***

These two products can be used in alternate every 15 days. They are more effective during early stages of infestation.

Thrips palmi

Thrips *(Thrips palmi)* is a tiny insect (approximately 1 mm long) and is found on the underside of leaves. It feeds on the leaf epidermis provoking silvery symptoms at the beginning. As the infestation builds up, the leaves start to become brownish and eventually die. Leaves can also be distorted and stunted. The insect is prevalent during the warm months.

It is advisable to avoid planting after August, as fields planted late are more susceptible to damage by thrips.

Silvery symptoms caused by thrips

Recommendations for chemical control

- Chemical treatment should be carried out only after careful scouting of fields for the presence of thrips and damage symptoms. Thrips infestation usually starts along field borders.

  Treatment with a motorized knapsack mistblower gives a better plant coverage, since thrips are present on the underside of leaves. One application should suffice.

  At first signs of silvering, apply any one of the followings :

	Rate / ha	Rate / arp
DICARZOL (formetanate) 500 SP + CODACIDE OIL	***400 g + 1.4 L***	***165 ml + 590 ml***
TRACER (spinosad) 48 SC + CODACIDE OIL	***300 ml + 1.4 L***	***125 ml +590 ml***

Aphids

Aphids (*Myzus persicae, Macrosiphum euphorbiae, Aulacorthium solani* and *Aphis gossypii*) are more important in seed potato fields as they are notorious vectors of viruses. They can also cause leaf distortion and premature senescence.

Leaf distortion caused by aphids

Recommendations for chemical control

In areas where aphids are known to occur and in seed potato fields, apply

- In the furrows at planting:

	Rate / ha	Rate / arp
ACTARA (thiamethoxam) 25 WG	***600 g***	***250 g***

- After 6 weeks, if there are more than 10 aphids/ leaf and also in areas where aphids are common, apply any one of the followings :

	Rate / ha	Rate / arp
CONFIDOR (imidacloprid) 70 WG	***125 g***	***50 g***
ACTARA 25 WG	***80 g***	***35 g***

Around 400 L/ha (170 L/arp) of solution will be required.

Leaf eating caterpillars and cutworms

Two species of leaf eating caterpillars (*Helicoverpa armigera* and *Spodoptera littoralis*) commonly occur. The most important species is the tomato fruitworm *Helicoverpa armigera*. The very young larvae usually spin webs on the top leaves. The older larvae are voracious feeders but do not form webs. The other species *Spodoptera littoralis* feeds on the older leaves and is found within the canopy.

Insecticide treatment should be carried only if larvae are present and/or if 25% defoliation is noted.

Recommendations for chemical control

Apply any one of the followings :

	Rate / ha	Rate / arp
CORAGEN 20 SC + COMPLEMENT S	***300 ml + 250 ml***	***125 ml +105 ml***
TRACER 48 SC+ COMPLEMENT S	***200 ml+ 250 ml***	***80 ml +105 ml***
STEWARD (indoxacarb) 30 WG	***130 g***	***55 g***
RUNNER (methoxyfenozide) 240 SC	***600 ml***	***250 ml***

Cutworms occur at the early stages of growth and they severe the plants at the base. Any of the above-mentioned products will give good control of cutworms.

Mites

Red spider mites (*Tetranychus urticae*) produce yellowish/whitish spots (specks) on the leaves, that can lead to the drying of the leaf if the attacks are important and thus causing yield loss. They spin webs in contrast to broad mites (*Polyphagotarsonemus latus*) that do not spin webs. The latter cause an irreversible distortion of leaves, giving them a stretched appearance, almost like a string. In case of severe infestation, the development of the plant is arrested.

Red spider mites infestation

Recommendations for chemical control

At appearance of symptoms (oily black spots on underside of leaves; reddish, wrinkled leaves), apply any one of the following:

	Rate / ha	Rate / arp
PRIDE (fenazaquin) 200 SC	***400 ml***	***165 ml***
DICARZOL 500 SP	***400 g***	***165 g***

Tuber moth

The potato tuber moth (*Phthorimaea operculella*) lays its eggs on leaves or on exposed tubers. On leaves, the larvae can cause mines and eventually descend along the stems towards the tubers. On the tubers the eggs are laid near eye buds and on hatching the young larvae penetrate the tubers.

Infested potato tuber

Earthing-up is the best management strategy to prevent damage by the tuber moth. All exposed tubers must be covered with soil.

However, if harvest should be delayed and leaves have senesced, apply on the soil surface any one of the following:

	Rate / ha	Rate / arp
KARATE ZEON (lambda cyhalothrin)	***600 ml***	***250 ml***
STEWARD 30 WG	***130 g***	***55 g***
RUNNER 240 SC	***600 ml***	***250 ml***

General guidelines regarding use of insecticides in potato

- ✓ **Apply insecticides only when insects are present. Do not apply on a routine basis.**
- ✓ **Never apply insecticides of the same class more than twice during a crop cycle.**
- ✓ **Apply recommended rates.**
- ✓ **Check product compatibility.**
- ✓ **Insecticides work best when applied under cool conditions (i.e. early morning or late afternoon).**
- ✓ **Calibrate spraying equipment prior to application. Note that the rates applied will differ according to the stage of plant growth.**
- ✓ **Always use personal protective equipment when handling insecticides.**
- ✓ **Follow instructions on insecticide labels regarding disposal of empty containers, spillage precautions, and washing of spraying equipment.**
- ✓ **Observe *pre harvest intervals* (PHI) as shown below:**

Product	**PHI (days)**
Coragen	**3**
Patron	**28**
Dicarzol	**14**
Tracer	**7**
Steward	**3**

Product	**PHI (days)**
Runner	**14**
Karate Zeon	**14**
Pride	**15**
Actara	**14**
Confidor	**7**