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# Insect Control Recommendations For Mint Production in Idaho

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Insects and mites cause damage to developing spearmint and peppermint and in many cases must be controlled to obtain maximum oil yields. This publication describes the common pests that attack mint, their seasonal cycle and injury and control methods.

When you find an infestation, it is important to identify the insects correctly. Proper identification will help growers avoid needless insecticide applications.

## Cutworms and Loopers

Several species of cutworms cause damage by feeding on emerging plants in early spring. Other species damage plants in mid-to-late season.

Early spring damage can be caused by the army cutworm, redbacked cutworm, spotted cutworm or other species. These cutworms overwinter as partially grown larvae and begin to feed as the mint starts growing in the spring. The redbacked cutworm, however, overwinters as an egg and is slightly later in its damage. Cutworms are nocturnal feeders. They spend the day under clods or beneath the soil surface.

The first sign of damage is that the mint is not growing in the spring, or only part of the mint is growing. If you examine them closely, you will see that the underground rhizomes are cut off or seriously damaged. By gently moving clods, loose soil or plant debris, you will find cutworms.

To assess cutworm damage, sample at least 10 1-square foot soil plots (1 square foot  $\times$  2 inches deep) across the field to estimate cutworm population levels. In newly planted fields, an insecticide treatment is recommended if you find an average of at least one cutworm per square foot sample. In well established, healthy mint fields, an insecticide treatment is recommended only when the average number of cutworms exceeds five per square foot sample.

Mid-to-late season cutworm or looper damage is caused by foliar feeding caterpillars. The species involved could be the variegated cutworm, spotted cutworm and/or loopers. You will find foliar injury from these worms by sampling the growing mint plants.

Assess the cutworm population by sampling with a 15-inch diameter sweep net after the mat is 6 inches high. Take five sets of 5-sweep (90° sweep) samples in several areas of the infested field. If you find an average of three or more cutworms per sweep, apply an appropriate insecticide.

Assess the looper population by sampling in the same way. If you find an average of five or more  $\frac{1}{2}$  inch or longer loopers per sweep, apply an appropriate insecticide. Since mature caterpillars are difficult to control, apply insecticides when the loopers are small to ensure maximum kill.

## Aphids

Aphids are an occasional pest of mint. They damage mint plants by sucking sap. Their sheer numbers may weaken the plants causing water stress. Stressed plants are more subject to spider mite injury and produce less healthy foliage. Most aphids spend the winter on perennial hosts and move to summer hosts. The mint aphid overwinters on the mint rhizomes and roots.

Growers will frequently find some aphids in mint fields during the growing season; however, growers should not allow the plants to become stressed. When aphid populations increase to 15 to 20 per sweep, apply an insecticide.

## Mint Flea Beetle

The mint flea beetle is another pest that causes greater concern than its damage warrants. The most severe damage results from larval feeding in the roots, the symptoms of

which are first noted in the spring when the mint stand does not "green-up." Close examination reveals 1/32-inch holes or tunnels in the roots. Heavy populations can result in large areas of dead or weak mint. The adult flea beetle emerges in early July and feeds on the leaf surface causing a shot-hole appearance as the mint is maturing.

Shot-hole damage by itself does not necessarily warrant insecticide treatment. You may discover significant numbers of beetles in a field and be unable to find any evidence of shot-holes on the leaves and have no root damage the next spring.

If symptoms develop early in mint and you find larvae in the roots, direct your insecticide applications to control adult beetles in mid-July before the eggs are laid. Chemical control of the larval stage in the soil is ineffective.

## Two-Spotted Spider Mite

The two-spotted mite is an important but infrequent pest of all commercial varieties of mint in Idaho. The mite is much more damaging in summers with early and prolonged hot periods. Water stressed fields are more likely to suffer mite damage.

The adult spider mite overwinters in cracks in the soil and beneath dead plant debris. Eggs are laid on the undersides of leaves. Depending on temperature, the eggs hatch in 4 to 5 days, and the life cycle is completed in another 14 to 16 days. Many generations are completed in a season.

Spider mite injury appears as small silvery or dry spots on the upper surface of the leaf. Severely damaged leaves eventually turn brown and drop. Mite population buildup occurs in localized areas of the field. Some portions of a field may be severely damaged while other areas remain uninfested.

To evaluate the mite infestation, select areas of the field early in the season that have a history of mite damage, especially the drier and dustier areas. As the season progresses into late June, begin weekly sampling to determine the need for insecticide treatment.

To sample for two-spotted spider mites, select 50 leaves, and count the mites with the aid of a hand lens. When leaf counts exceed an average of five mites per leaf, populations can increase rapidly, and damage can result. If leaf counts of several areas of a field reveal five or more mites per leaf, apply an appropriate miticide. This decision should be tempered by such factors as stage of growth, time to harvest, moisture conditions and mite predators.

Naturally occurring mite predators such as predaceous mites, minute pirate bugs, lacewings and small, black lady beetles are present in mint fields but usually at levels too low to reduce spider mite populations significantly when plants are severely stressed from mite feeding. An average of .5 predator per leaf may keep the mite population below levels requiring miticide treatments.

Excessive insecticide treatments can adversely affect predator populations under some conditions. Without the predators to control two-spotted mite populations, these harmful mites can explode to high levels. Fields that are fall flamed usually have lower mite populations the following spring. Fall plowing or cultivation similarly reduces mite populations the following spring.

## Mint Root Borer

The mint root borer is the most serious insect pest of peppermint in Idaho. It is of little concern in spearmint varieties or in citrata.

Peak emergence of the adults is mid-July. Larvae hatch from eggs deposited on the undersides of the leaves and then feed for 4 to 5 days before moving to the soil to feed inside the rhizomes. Once inside the rhizomes, they hollow them out killing the plants. The damage occurs from August through October.

Evaluate infested fields by carefully digging and screening several square-foot soil samples (3 to 4 inches deep) in suspect areas. Counting root borer larvae from soil samples is useful in detecting infestations, comparing infestations from year to year or for comparing pretreatment and posttreatment. Direct control efforts toward the developing larvae and pupae during the early fall. Apply insecticides postharvest between August 15 and October 1, and they must be irrigated or cultivated into the soil. Treatment levels for mint root borer have not been established, but some guidelines are available:

1. New fields (1 to 2 years old) should be treated if you find any root borer larvae. This is true if the grower plans to keep the mint in for 1 or more additional years.
2. Older fields (3 to 5 years old) should not be treated if the grower plans to take the mint out and not harvest another crop. The larvae will not develop on a nonpeppermint following crop.
3. Intermediate age fields should be treated if in good vigor and if the grower plans to harvest the following year.
4. Treat with insecticide any field from which root stock will be taken if you have found any borer larvae in soil samples.

Several cultural control methods are useful in reducing root borer populations. Field trials have shown that cultivation, disking or shallow plowing of mint fields after they have gone dormant reduces mint borer populations by 80 to 90 percent.

## Minor Pests

The **mint stem borer** (*Pseudobaris nigrina*) is a small (1/8-inch), black weevil whose white larva may be found boring in mint plants at the soil line. The larvae bore up into the stem or down into the rhizome. Healthy, vigorous mint can withstand stem borer infestation, whereas mint under stress from other causes (disease, fertilizer,

moisture, etc.) may be seriously damaged. No insecticides are registered for stem borer control; however, insecticides applied for loopers and aphids during mid-June reduce stem borer populations. In most instances, the stem borer does not justify control.

The **garden symphylan** is a tiny centipede-like pest that is usually non-economic in Idaho mint. They overwinter in the soil as adults and nymphs becoming active in the spring. Numbers increase from April through August as eggs are laid in the soil and the new nymphs develop and mature. One or two generations of garden symphylans occur each year. They feed on the root system of plants, including mint, and, at high population levels, reduce plant vigor and delay growth.

To estimate the symphylan population, sample 25 to 30 sites per field, counting the number of symphylans per shovelful in the top 6 inches of moist soil. Plant damage can result if you find an average of 10 or more per sam-

ple. Symphylans tend to be in localized areas of a field, and you need not treat an entire field with insecticide.

The caterpillar of the **painted lady butterfly** is usually on Canada thistle and related weeds. In rare outbreak years, these caterpillars invade mint and cause significant damage to foliage.

The **false celery leaftier** caterpillar is in many mint fields but seldom at levels requiring control. The tiny caterpillar feeds in mint terminals eventually webbing the terminal leaves together and forming a cocoon.

The **strawberry root weevil** is an occasional serious pest of mint in Idaho. The larva feeds on mint rhizomes causing girdling and eventual death of the root system. The adults emerge from early to mid-June. Apply insecticides to control adults before they lay eggs (approximately June 20 in southwestern Idaho). Effective control of the larval stages is not possible with insecticides currently registered on mint.

## Insecticide Recommendations for Mint Insect Control

Pest	Rate of active ingredient per acre	Remarks (interval between last application and harvest)
Cutworms	Lorsban - 1 to 2 lb	90 days. Treat during May and June when field counts indicate damaging populations are developing or are present. When larvae are less than 3/4-inch in length, use 1 lb. When larvae are 3/4-inch or more in length, use higher rate. Apply in at least 10 gal spray per acre. Make only one application during the growing season.
	Orthene - 1 lb	14 days. Use 20 to 100 gal spray mix by ground or in 5 to 10 gal spray mix by air per acre. Begin applications when eggs or larvae first appear. Do not apply more than twice per season.
	Methomyl - .9 lb	14 days. Variegated cutworm only.
Loopers	Malathion - .9 lb	7 days.
	Orthene - 1 lb	14 days. Use 20 to 100 gal spray mix by ground or in 5 to 10 gal spray mix by air per acre. Begin applications when eggs or larvae first appear. Do not apply more than twice per season.
	Methomyl - .9 lb <i>Bacillus thuringiensis</i> : Follow manufacturer's directions on label	14 days. 0 days. Treat when larvae are young before the crop is heavily damaged.
Aphids	Orthene - 1 lb	14 days. Use 20 to 100 gal spray mix by ground or in 5 to 10 gal spray mix by air per acre. Begin applications when you find 15 to 20 aphids per sweep. Do not apply more than twice per season.
	Malathion - 1 lb	7 days.
	Metasystox-R - .75 lb	14 days.
Mint flea beetle	Malathion - 1 lb	7 days. Apply foliar spray after adults emerge in early July.
	Methomyl - .7 to .9 lb	14 days. Apply foliar spray after adults emerge in early July.

# Insecticide Recommendations for Mint Insect Control (cont'd)

Pest	Rate of active ingredient per acre	Remarks (interval between last application and harvest)
Spider mites	Kelthane EC - 1.2 lb	30 days. Do not make more than one application per crop season. Do not feed treated hay or spent hay to livestock.
	Omite - 1.5 to 2.25 lb	14 days. Apply in minimum of 10 gal water by air. Do not make more than two applications per year. Do not feed treated mint to livestock.
	Comite - 1.6 to 2 lb	14 days. Apply in minimum of 10 gal water. Do not make more than two applications per year. Do not feed treated mint to livestock.
	Metasystox-R - .75 lb	14 days. For established infestations, make two applications 10 to 14 days apart.
Mint root borer	Lorsban - 2 lb	Apply postharvest only for mint root borer when field counts indicate damaging populations are present. Apply between Aug. 15 and Oct. 1 when larvae are visible in rhizomes and surrounding soil. Follow treatment with approximately 1 acre inch of sprinkler irrigation to incorporate insecticide into soil. <b>Make only one postharvest application per season. Do not apply preharvest for this pest.</b>
Garden symphylans	Dyfonate - 2 lb	Apply broadcast, and incorporate into soil by disking before planting or on established plantings before spring growth. Do not apply terbacil for at least 3 weeks before or after Dyfonate application.
Strawberry root weevil	Malathion - 1 lb	7 days. Malathion is most effective when applied at night for controlling adults climbing up the plants to feed. Under optimum conditions, this material has not provided more than 50 percent control. It is the only registered material available for use on mint for root weevil control.

## Insect Control Precautions and Recommendations

1. Do not use the mint hay or spent hay for food or animal feed unless permitted by the labels of all spray products used.
2. Always protect pollinators. Wait until the pollinators have left the field before applying insecticides. Choose insecticides that are least toxic to pollinators.
3. Thorough coverage is necessary for insect and mite control.
4. Do not allow spray to drift to neighboring crops.
5. Buffering increases effectiveness of certain insecticides.
6. For more information in your area, contact your Extension county agent.

Methomyl, Dyfonate and Metasystox are especially hazardous to applicators. Follow label instructions precisely when storing, handling and applying these poisonous materials. Post fields as required to prevent others from entering. Destroy containers as label directs.

**Pesticide Residues** — These outlines for use are based on the best information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues, follow label on dosage levels, number of applications and minimum interval between application and reentry or harvest.

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