

# Crop Profile for Radishes in Ohio

Prepared: December, 1999

## General Production Information

(Cruciferae: *Raphanus sativus*)

- Acres in Ohio: 2,130 (5) - 100% for fresh market
- Percent of US Acreage/Rank: 8.87%/3rd (3)
- Number of Growers: 28 (3)
- Per Acre Value: \$3000 - \$3100(2)
- Value of Production in Ohio: \$6,390,000 - \$6,603,000 (2)

## Location Of Production

The main pocket of concentrated production can be found in northeast Ohio in muck crop soils of Huron and Stark counties. (3)

## Production Methods

Radishes are grown in Ohio on muck soils. The crop grows quickly and can reach harvestable size in 20-30 days. Radishes are planted from March through September. Soil pH should be maintained between 5.2-5.6. Fertilizers (40-50 lb. each per acre of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O) should be broadcast and disked in prior to planting. At planting seeds are spaced to give 10 plants per foot in 10 inch rows, with 5-6 rows/bed, 7 beds/42 feet. No thinning of emerging plants is done. Timely harvest is important to avoid pithy roots.

# Insect Pests

## 1. Cabbage Maggots

Cabbage maggots are the most serious pests of radishes. The cabbage maggot overwinters in the soil in the pupal stage. In the spring the adults, dark ash–gray flies about ¼ inch long with black stripes and bristles on their backs, emerge and lay eggs at the base of a host plant. The small white larvae or maggots tunnel into the roots or feed on the root surface. The feeding can kill small plants and render root crops like radishes unmarketable. The tunneling can also provide entry sites for pathogens that cause further damage to the root. Cabbage maggots thrive in cool, moist weather and therefore cause more damage early in the season. Infestations at this time can be in 100% of the radish acreage. There are usually four overlapping generations of cabbage maggots per year.

## 2. Black Cutworms

Adult cutworms are dark moths about 1 1/2 inches long with a black, dagger-shaped mark near the outer edge of the front wing. The adults become active in the early spring at which time the females lay their eggs. The larvae, gray-black worms reaching two inches in length when fully grown, soon emerge. The larvae feed on young plant near the soil line, usually cutting off the plant. Most of this damage occurs at night when the cutworms are most active. During the day the larvae hide under the plant or debris in the field, near or on the surface of the soil.

## 3. Aphids

Aphids are usually not a significant problem in radishes in Ohio. But occasionally the green peach aphid has caused significant damage in radish field during periods of very hot and dry weather. Aphids damage radishes by sucking the sap from the leaves. In high population densities, aphids can defoliate and kill small plants. Furthermore, tolerance to leaf damage from aphid feeding for bunched radishes (those sold with the leaves attached) is low.

## CHEMICAL INSECT CONTROLS

- **Chlorpyrifos (Lorsban)**

- Percent acres treated: 57% (5)

- Target pests: cabbage maggot (1)

- Average rate and frequency of application of the most common formulation: (5)

- Lorsban 4EC – 1qt/A, once at planting

- Type of application: Liquid in furrow (5)

PHI: 22 days (5)

Efficacy rating: Good to Very Good.

Rational for use: Essential in the prevention of damage to radishes when maggot flies have been active. Radishes cannot be sold with maggot damage.

○ **Esfenvalerate** (Asana)

Percent of acres treated: 15% (5)

Target Pests: black cutworms (1)

Asana XL - 6 oz/A, once

PHI: 3 days

Efficacy rating: Good

Rational for use: Used as needed when scouting programs detect black cutworm activity.

○ **Diazinon**

Percent acres treated: 6% (5)

Target pests: aphids (1)

Average rate and frequency of application of the most common formulation: (5)

Diazinon 1 qt/A, once

PHI: 14 days

Efficacy rating: Good

Rational for use: As needed for occasional aphid infestations in hot, dry weather.

○ **Cyfluthrin** (Baythroid)

Percent of acres treated: 6% (5)

Target Pests: black cutworm (1)

Average rate and frequency of application of the most common formulation: (5)

Baythroid 2EC - 2.8 oz/A, once

PHI: 0 days (1)

Efficacy rating: Good to Very Good

Rational for use: Used as needed when scouting programs detect black cutworm activity.

**CULTURAL CONTROLS** (2)

For cabbage maggots: Remove or disk under well before planting any decaying organic matter. Plant radishes in warm, well-drained soils. And if possible, plant to avoid peak emergence. For cutworms: Eliminate all winter annual weeds before planting.

## **BIOLOGICAL CONTROLS**

Ground dwelling insect predators are known to feed on cabbage maggot eggs, but do not provide sufficient suppression to avoid economic damage.

## **Diseases**

### **1. Downy Mildew**

Downy mildew is caused by the fungus *Peronospora parasitica*. It overwinters in roots from diseased plants. The disease appears as small yellow leaf spots that later turn brown with bluish-black lace-like markings. Under wet conditions, a white downy mold develops on the underside of the leaf. The leaf spots render the radishes unmarketable. The vascular tissue becomes discolored and the roots discolor internally. In advanced stages, the skin is roughened by small cracks and the roots may split. During storage, radishes infected with downy mildew will dry out more quickly than those without the disease. Downy mildew is promoted by cool weather in the spring or fall and prolonged wet conditions.

### **2. White Rust**

White rust causes pale dusty spots to develop on the lower surface of the radish leaves. The causal fungus overwinters on residue from diseased plants. Dusty spores from the leaf spots can be spread long distances by wind and short distances by the movement of workers and tools in the field. The appearance of spots on the radish leaves destroys its marketability.

## **CHEMICAL DISEASE CONTROLS**

### **Ridomil Gold Copper**

Percent acres treated: 12% (5)

Target disease: Downy Mildew and White Rust (5)

Average rate and frequency of application of the most common formulation: (5)

Ridomil Gold Copper – 1lb/A, 1-2 times

Method of application:

PHI: 7 days

Efficacy rating: Very Good

Rational for use: Effective control for both diseases.

## **CULTURAL CONTROLS** (1)

Space rows to allow for good air flow and drying. Avoid overhead irrigation late in the day.

## **Weeds**

Purslane, Red-root pigweed, Vivid amaranth, Oak leaf goosefoot, Nutsedge, Shepards purse, Pineapple weed and Giant crabgrass. (5)

## **CHEMICAL CONTROLS** (5)

None reported. The growing season for radishes is so short that none of the growers have significant weed problems to warrant the use of herbicides.

## **CULTURAL CONTROLS**

Hand hoeing, and mulching with straw or black plastic.

## **CRITICAL PEST CONTROLS ISSUES**

Important pesticides used for which there are few or no other alternatives or the only alternatives are organophosphates, carbamates or B2 carcinogens include:

Chlorpyrifos – Growers rarely seed damage from cabbage maggots because chlorpyrifos is used in all plantings early in the season. In the spring when the weather is cool, growers can sustain up to 50% loss because the crop develops slowly enough that the Lorsban breaks down and loses effectiveness.

## **CHEMICAL AND NONCHEMICAL ALTERNATIVES**

There are no alternatives to the use of chlorpyrifos since dyfonate became unavailable.

## Contacts

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## References

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3. *The 1997 Census of Agriculture*. U.S. Department of Commerce, Bureau of the Census. March 1999. Part 35.
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