



URI COLLEGE OF THE
ENVIRONMENT AND LIFE
SCIENCES (CELS) OUTREACH
CENTER

3 East Alumni Avenue
Kingston, Rhode Island 02881

For more information:

Call:

In RI: URI MGA Hotline
1-800-448-1011
Mon.-Thurs. 9:00 a.m.—2:00 p.m.

In MA and CT: 401-874-2900

Outside New England please
contact Cooperative Extension in
your county.

Websites:

URI Master Gardener Association
www.urimga.org

CELS Outreach Center
www.uri.edu/cels/ceo

CLUBROOT DISEASE OF CRUCIFERS

Clubroot is a worldwide problem of temperate climates in the production of cruciferous vegetables such as cabbage, broccoli, cauliflower, radishes, kale, brussels sprouts, and turnips, as well as field crops such as mustard and rape. The disease was known as early as the 13th century in England where it was called "finger and toe" disease because of the shape of infected roots. Clubroot is caused by the soil-borne fungus *Plasmodiophora brassicae*, which only infects plants in the crucifer family. The disease is favored by low pH.

Symptoms

The most striking symptom of clubroot is an abnormal enlargement of the root system, with clubs often thickest at the center, tapering spindle-like towards the ends. In radishes, clubroot causes distorted swellings on the base of the bulb and along the tap root. In severe cases, entire plantings are destroyed. Clubroot-infected plants often wilt on sunny days and permanent wilting may accompany advanced decay of infected roots. Severe stunting may be evident if infection occurs early and the disease progresses rapidly. The malformed and greatly enlarged roots are the key symptom of this disease.

Management

Clubroot is a very difficult disease to manage, and heavily infested areas may have to be abandoned for future crucifer production. Some control may be achieved with the following measures:

- A good crop rotation program, growing crucifers on the same soil no more than every third or fourth year, is essential.
- Liming soil to pH 7.2 or above may be helpful. Raising soil pH too high, however, may interfere with the growth of succeeding crops other than crucifers.
- The use of pathogen-free seedbeds and uninfected plants is essential to prevent introduction of the disease with transplanted crops.
- Application of an appropriate fungicide in transplant water prior to planting may help to reduce disease development.
- Clean and disinfect all tools.
- Some resistant cultivars are available. However, plant resistance has not been very useful in clubroot control because of rapid development of new races of the fungus.
- Grow your own transplants to ensure that the disease does not enter from infested areas on new plants.

Adapted from Sally A. Miller, Randall C. Rowe and Richard M. Riedel, Ohio State University Extension, 2000

PESTICIDES

ARE POISONOUS!! Read and follow all safety precautions on labels. Handle carefully and store in original containers out of reach of children, pets, or livestock. Dispose of empty containers immediately, in a safe manner and place. Pesticides should never be stored with foods or in areas where people eat.

When trade names are used for identification, no product endorsement is implied, nor is discrimination intended against similar materials. Be sure that the pesticide that you wish to use is registered in the state of use.

The user of this information assumes all risk for personal injury or property damage.

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