



GARDEN SYMPHYLAN: BIOLOGY AND CONTROL

The garden symphylan, *Scutigera immaculata*, is an occasional pest of greenhouses, home gardens, and some commercial crops throughout Washington. Distribution of the garden symphylan is worldwide. In Washington, it occurs in every county west of the Cascade Mountains, where it has posed the most serious pest problems. East of the Cascades, reports place symphylans in Spokane, Klickitat, Yakima, Benton, Walla Walla, Franklin, Adams, and Whitman counties. Symphylans have done considerable damage to asparagus in the Yakima Valley.

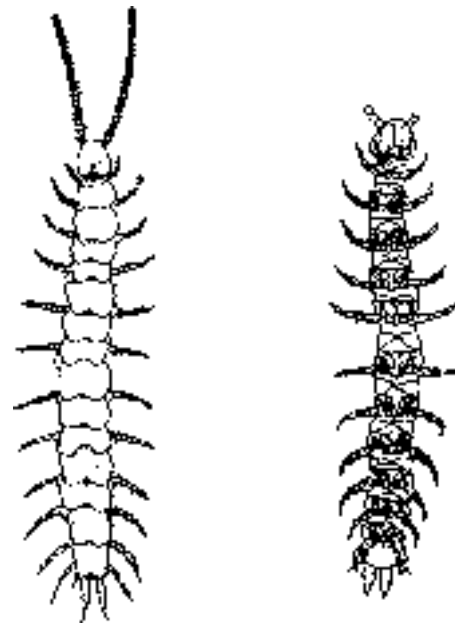
Appearance and Biology

Garden symphylans, about $\frac{1}{4}$ inch long, are fragile, white, and slender animals. They have a distinct head with slender antennae, 6 to 12 pair of legs, depending on the age of the individual, and a pair of stout tail feelers. Symphylans spend their entire lives in the soil, where they are difficult to find. Exceedingly active, they disappear quickly when disturbed.

The garden symphylan is not an insect, but often is confused with certain springtails, which are insects. To tell them apart, remember that springtails have only three pair of legs and move more sluggishly. Certain springtail species have a "spring" that propels them into the air when they are disturbed. Garden symphylans, closely allied with millipedes and centipedes, often are referred to as "greenhouse or garden centipedes." Centipedes and millipedes, however, have at least 15 pair of legs. You can separate them from symphylans using that characteristic.

Symphylans live in the soil but do not make definite runways or burrows. Where the soil is sufficiently

compact to permit regular use of cracks and crevices, symphylans may line them with silk so they can run through them quickly. Where soil is loose in texture, symphylans work their way among the particles. They usually occur in the top 10 to 12 inches, but may penetrate deep into the subsoil to escape from unsuitable conditions. This habit makes them difficult to control.



Dorsal and Ventral Views

Symphylans begin laying eggs in spring and continue throughout the summer. Egg deposits contain up to 20 eggs deposited in masses. Hatching takes place in about 10 days or more, depending on soil temperature. Garden symphylans develop fully in 45 to 60 days, with all life stages occurring in the soil. During hot, dry weather they migrate into the subsoil.

Host Plants and Damage

All vegetables, small fruits, and probably most flowers are susceptible to attack by the garden symphylan. This pest sometimes causes heavy damage to mint in western Washington. It also attacks coniferous seedlings in nurseries. Although cereals and grasses are hosts to symphyllans, little damage has been noted. This pest usually attacks plants a few days after they are set out. On tomatoes, symphyllans injure the older roots and devour new ones as fast as they develop. The plants wilt in the daytime, the stems become bluish, and the upper leaves turn dark green while the lower leaves turn yellowish.

When attack is severe, the plants die. Symphyllans may attack lettuce as early as November. The injury may persist until February or March. Symphyllans may sever or badly damage roots by chewing penetrating holes or gnawing extensively at the surface. Small, corky calluses develop over the injured tissue, giving attacked roots a galled and gnarled appearance.

Management

Specific chemical controls for this pest are not included here because products in the marketplace and registration status change too frequently. Use chemical recommendations from the annually revised *Pacific Northwest Insect Management Handbook*. You may obtain this information from field representatives, WSU county extension agents, and regional WSU Plant Diagnostic clinics in Prosser and Puyallup.

Fumigation

Fumigants vaporize and diffuse through the soil and kill symphyllans. They are both costly and difficult to

apply but may be desirable when land is heavily infested. You may treat nearly all crops using this method.

In western Washington, fumigate between mid-July and mid-September. If you fumigate earlier or later, the soil may be too cold and wet for good fumigant action. Fumigate in eastern Washington when soils are dry and warm. Summer land fallowing prior to fumigation will result in better fumigation, as it allows plant material in the soil to decompose.

Proper preparation of the soil is essential for good fumigation. The soil temperature should be 40° to 50°F. Good seed germination requires soil moisture. Prepare the soil to a good seedbed condition to a depth of about 12 inches. If a hardpan exists below the soil surface, subsoil the ground every 2 to 3 feet in two directions at a depth of 18 to 20 inches. Do your subsoiling in the summer when the soil is dry so it will fracture well. This practice allows deeper penetration of the vapors. Inject the chemical to a depth of 8 inches with the chisels set 12 inches apart. Immediately after application, compact the surface by rolling or floating to seal the fumigant in the soil. Do not disturb the soil for 2 to 3 weeks. Rain or low temperatures may retard movement of the fumigant, requiring a longer exposure period. Disking at the end of the exposure period will help release any fumigant that remains.

*Since fumigants are toxic to plants, do not plant until after the fumigant has left the soil. Generally it is safe to plant crops when you can no longer detect the odor of the chemical in the soil. Contact your county Extension agent, chemical field representative, or commercial applicator for recommendations on which chemical to use.

*Fumigants are hazardous to handle and should be applied only by experienced commercial growers or licensed applicators.

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Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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