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A PROGRESS REPORT OF INVESTIGATIONS CONCERNING THE SYMPHYLID AND ITS CONTROL

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Description

The symphylid, Scutigerella immaculata Newport, is a small white centipede-like animal which has become a serious pest to truck, nursery, vegetable crops in both field and greenhouses. Its economic importance has been generally restricted to the field in the past, but recently it has also become a serious menace to greenhouse crops.

Seasonal History and Habits

Adult and larval forms may be found in any month of the year, but in general the population reaches a peak during July and August. Adults are recorded as living for several years.

Symphylids are very sensitive to changes in soil temperature and moisture and will migrate from 2 to 3 feet into the subsoil when conditions in the top soil are unfavorable for their development. They are generally found in the first six inches of soil during the summer months.

Host Plants

There are no known plants which are resistant to symphylid attack. Their damage is usually more severe to row crops such as beans, peas, corn, etc., but they are known to attack certain grain and cereal crops which are broadcast. The known host list of this pest includes 86 plants. The more important crops attacked by symphylids in Oregon are listed as follows:

Alfalfa	Black locust	Chrysanthemum
Asparagus	Cabbage	Corn - field
Aster	Calendula	Corn - pop
Barley	Caragana	Corn - sweet
Beans - common	Carnation	Cucumber
Beans - lima	Carrot	Daisy
Beans - soy	Cauliflower	Egg plant
Beets - garden	Celery	Gardenia
Beets - sugar	Chard	Gourd

Grasses	Petunia	Spinach
Lentil	Poppy	Squash
Lettuce	Potato	Tomato
Muskmelon	Pumpkin	Turnip
Oats	Radish	Vetch
Onion	Rose	Violet
Peas	Russian olive	Watermelon
Pepper	Snapdragon	Wheat

Control Measures

The Department of Entomology has been working on symphylid control since 1937, but thus far no practical control has been developed. The following is a brief progress report of the control work thus far attempted.

Commercial Fertilizers: These have been tested extensively, and calcium cyanamid, calcium nitrate, ammonium phosphate, ammonium sulfate, and sodium nitrate at times were noted to sufficiently stimulate plants and enable them to withstand symphylid attack. These materials, however, had no control value. Lime has been applied at the excessive rate of ten tons per acre without being effective.

Cultural Methods: None of the cultural methods attempted have given much promise. Flooding has been practiced in California with success, but the topography of Oregon soil makes this practice impractical. Summer fallow has not been successful because of the longevity of the symphylid. The planting of crops when soil has been on the dry side has in certain instances enabled growers to obtain satisfactory stands. This, however, is not without exceptions and is generally subjected to climatic variability.

Chemical Control in the Field: Approximately 60 different chemicals have been tested in various rates and manners but thus far no practical control remedy has been devised. Some of the ineffective materials are listed as follows:

Napthalene	Sulfur	Rock salt
Paradichlorobenzene	Nicotine sulfate	Phenothiazine
Calcium Cyanide	Derris	Quassia
Carbon disulphide	Tobacco dust	DN-dust
Copper cyanide	Carbon tetrachloride	Calomel
Lead arsenate	Selenium	Metaldehyde
Lime sulfur	Borax	Calcium arsenate

Control by chemicals generally centers about soil fumigants and the most effective fumigant thus far tested is chloropicrin. This material is very toxic to symphilids and other soil organisms. Chloropicrin-treated soil generally produces crops of increased vigor and yields. The limiting factor in the use of this material is its prohibitive cost. It must be used at approximately 250-300 pounds per acre to be effective and the monetary expenditure for chloropicrin at these rates varies between $200 and $300 per acre.

In greenhouses, symphylid control is greatly simplified by the use of raised benches. Steam, chloropicrin, hot water, and other agents can be used to eradicate the pests from benches of this type. No tests have been made with electrical soil sterilizing equipment, but in all probability these also would be quite satisfactory. In ground benches the control problem is similar to that of field conditions and it is nearly impossible to sterilize soil to any great depth. Most success thus far has been obtained by planting an inexpensive trap crop (spinach, lettuce, etc.) and thus bringing the symphylids to the upper layer of the soil before applying any control measure.

Fig. 2 -- Symphylid Injury to Germinating Corn.
Note Symphylid on Stem of Upper Right.

Fig. 3 -- Symphylid Injury to Germinating Peas

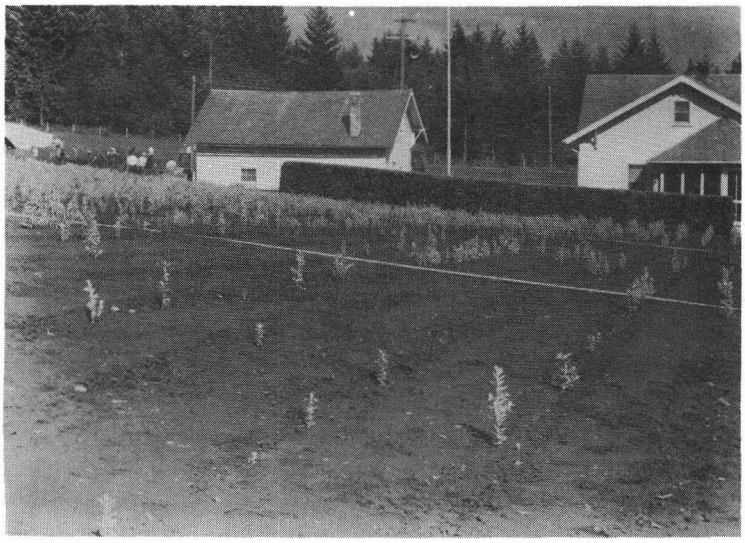

Fig. 4 -- Symphylid Damage to Russian Olive Planting,
Oregon State Nursery

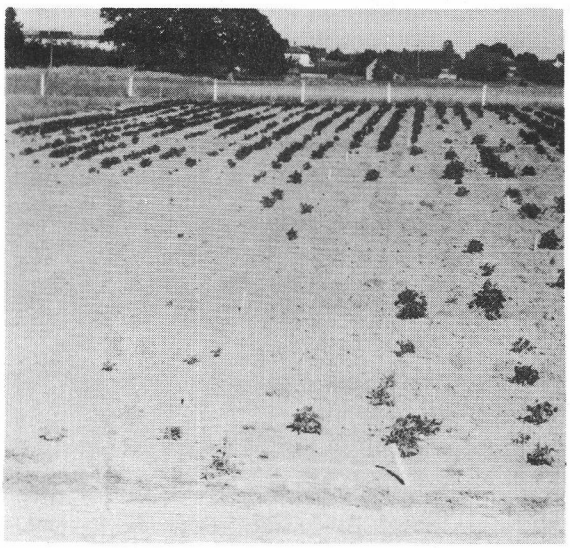

Fig. 5 -- Symphylid Damage to Bean Planting,
South Farm, Oregon State College