A PROGRESS REPORT OF INVESTIGATIONS CONCERNING THE SYMPHYLID AND ITS CONTROL

by

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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.

Symphyllids 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 symphyllids in Oregon are listed as follows:

<table>
<thead>
<tr>
<th>Alfalfa</th>
<th>Black locust</th>
<th>Chrysanthemum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparagus</td>
<td>Cabbage</td>
<td>Corn - field</td>
</tr>
<tr>
<td>Aster</td>
<td>Calendula</td>
<td>Corn - pop</td>
</tr>
<tr>
<td>Barley</td>
<td>Caragana</td>
<td>Corn - sweet</td>
</tr>
<tr>
<td>Beans - common</td>
<td>Carnation</td>
<td>Cucumber</td>
</tr>
<tr>
<td>Beans - lima</td>
<td>Carrot</td>
<td>Daisy</td>
</tr>
<tr>
<td>Beans - soy</td>
<td>Cauliflower</td>
<td>Egg plant</td>
</tr>
<tr>
<td>Beets - garden</td>
<td>Celery</td>
<td>Gardenia</td>
</tr>
<tr>
<td>Beets - sugar</td>
<td>Chard</td>
<td>Gourd</td>
</tr>
</tbody>
</table>
Grasses
Lentil
Lettuce
Muskmelon
Oats
Onion
Peas
Pepper
Petunia
Poppy
Potato
Pumpkin
Radish
Rose
Russian olive
Snapdragon
Spinach
Squash
Tomato
Turnip
Vetch
Violet
Watermelon
Wheat

Control Measures

The Department of Entomology has been working on symphyllid 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 symphyllid 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 symphyllid. 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
Paradichlorobenzene
Calcium Cyanide
Carbon disulphide
Copper cyanide
Lead arsenate
Lime sulfur
Sulfur
Nicotine sulfate
Derris
Tobacco dust
Carbon tetrachloride
Selenium
Borax
Rock salt
Phenothiazine
Quassia
DN-dust
Calomel
Metaldehyde
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 symphyllids 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