

# Carrot Budmite

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Distorted foliage and umbels on carrot seed plants have been noted in Idaho for many years. Much of this distortion can be correctly attributed to infection by aster yellows. However, some is not typical of this disease.

In 1945, Idaho plant pathologists listed green dwarf, mosaic and stunt as other virus diseases causing distortion of carrot plants in Idaho. However, later research by W. R. Simpson, of the Parma Branch Station, did not confirm these symptoms as being caused by a virus. Several years later herbicides used in producing carrot seed were blamed for this distortion, but this cause also was disproved by D. F. Franklin, superintendent at the Parma Station.

## DISCOVERY

In the summer of 1963, on research plots at the Parma Branch Experiment Station, eriophyid mites were discovered infesting distorted carrot umbels. Subsequent investigations proved that these mites were capable of causing distortion of carrot seed plants similar to that attributed to mosaic. Surveys in southwestern Idaho carrot seed fields in 1964 revealed eriophyid mites in the entire area. These were identified as the carrot budmite, Aceria peucedani (Can.), by H. H. Keifer.

## DESCRIPTION

The carrot budmite is a minute, wormlike mite about 1/100 of an inch long and about 1/3 to 1/2 as wide. It can usually be seen only with the aid of a hand lens or other magnification. It is creamy-white in color, elongated tear-drop in shape and possesses only 2 pairs of legs situated well to the front of the animal.

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A carrot umbel exhibiting heavy distortion from attacks of the carrot budmite.

## ORIGIN

Very little is known concerning this mite. It was apparently introduced from Europe prior to 1945. In that year it was collected in California where it was reported to be damaging seed heads of carrots.

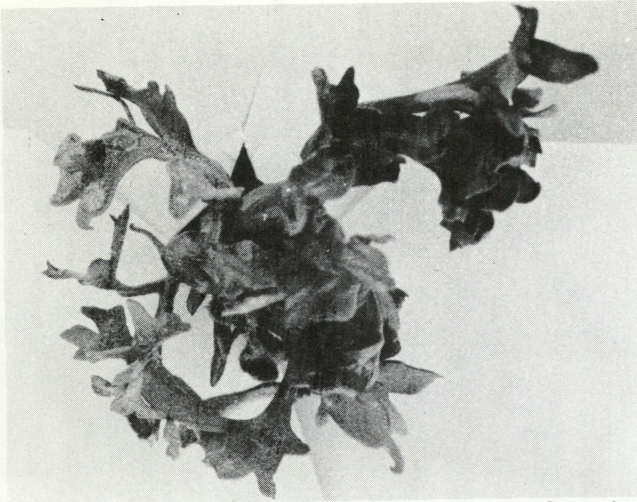
## LIFE HISTORY

In early summer, when the carrot seed plant begins to bloom, this mite can be found on the flowers of infested plants. On a heavily infested plant the foliage and involucre will be distorted. Portions of the umbel will turn brown early. Petals may fail to show the characteristic creamy-white color normal to the plant. Seed production may be virtually eliminated.

From late bloom to petal fall, when climatic conditions are favorable, mites will congregate on the upper portions of the umbel by the thousands. From here they may float in air currents or attach themselves to visiting insects and thus are dispersed to other host plants. If seedling carrots are in the vicinity the mites will infest them. The mites crawl down into the crown of the young carrots to feed on the succulent tissues of the growing point.

When infested carrot stecklings (roots) are harvested and placed in storage, the mites continue to feed and multiply throughout the winter. Transporting infested stecklings or carrot roots is probably an important method of dispersal of this mite into all carrot seed producing areas of the world.

In the spring when the infested stecklings are planted for a seed crop, mites are transported with them from storage to the field. As the seed plant grows, all protected growing areas of the plant become infested. Thus, the yearly cycle of mite infestation is completed.



**A young carrot seedling exhibiting extreme distortion caused by attack of a high population of carrot budmite.**

### DAMAGE

Mite infestation of the seedling plants often results in distorted, stunted plants which produce small roots. Heavily infested plants usually do not produce marketable roots or stecklings.

Heavy infestation of the steckling in storage can kill the growing point and when the steckling is planted no growth occurs. This results in a decreased plant stand in the seed field. Lighter infestations may cause death of the plant after growth is initiated or may weaken the steckling sufficiently to delay growth and maturity of the plant. Quite often the infested plant may be just coming into bloom at normal seed harvest time.

To investigate the damaging effects of the carrot budmite 12 stecklings which had been lightly infested and 12 which had been heavily infested when stored were planted in the greenhouse.

Results of this test reveal that, of the lightly infested stecklings; 9 grew vigorously, 1 failed to grow and 2 resulted in stunted dying plants. Of the heavily infested stecklings, only 5 grew. Of the 5 which did grow, 4 were dying about a month after planting and only 1 achieved normal growth.

Heavy infestations of the seed plants may reduce seed yields drastically. In 1964, carrot seed plants in the field were selected for degree of mite infestation as determined by foliage distortion when the second order umbels were in bloom. Results of these experiment are given below.

These results demonstrate that this mite has an effect on seed yields. Medium mite infestations reduced seed yields approximately 18 percent while heavy infestations reduced yields by 53 percent.

### CONTROL

Since the cause of this problem has only recently been demonstrated, no sure control can be recommended at this time. Considering this mite's apparently limited methods of dispersal, isolation of steckling fields from seed fields should help reduce the damage. At least ¼-mile isolation would be necessary. On the Parma Branch Station, Diazinon sprays applied at about 1½ week intervals until blossom apparently curbed a heavy infestation. Systemic miticides such as demeton, phorate, or Disyston look promising.

**Effect of mite infestations on carrot stecklings during winter storage.\* Parma, Idaho, 1964.**

Degree of infestation	No. of roots	Date planted	No. of plants growing 2/24	Condition of plants 3/16
Light	12	2/10/64	11	9 vigorous 2 dying
Heavy	12	2/10/64	5	1 vigorous 4 dying

\*Carrot stecklings stored 11-4-63

**Seed yield of plants selected for light, medium and heavy mite infestations as determined by degree of foliage distortion when the second order umbels were in bloom. Parma, Idaho, 1964.**

Mite infestation	No. Plants	Avg. yield per plant (grams)	Avg. yield per acre (pounds)	Percent reduction in yield
Light	12	19.1	644	
Medium	9	15.6	529	17.9
Heavy	9	8.9	302	53.1

THE GROWER IS RESPONSIBLE for residues on his crops as well as for problems caused by drifts from his property to other properties or crops.

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JAMES E. KRAUS, Director