Diseases of Greenhouse Cucumbers in Essex Co., Ontario in 1958

R.W. Walsh

In Essex County, between 1 Jan. and 31 July, approximately 80 acres of greenhouse vegetables, 65 acres of cucumbers and 15 acres of tomatoes, are grown. This acreage does not include that devoted to the production of vegetable seedlings grown for early field crops.

In February low incidence of light and low temperatures were the limiting factors in the production of cucumbers. During the period 13-16 Feb. shortly after most of the seedling plants had been set in the ground beds, outside temperatures dropped to -10°F. Heating facilities in many greenhouse ranges were inadequate and inside temperatures ranged from 38-45°F. for several hours. These low temperatures chilled tender plants and left them wilted for 5-7 days. Within a week bright sunny days raised greenhouse temperatures to over 90°F. further injuring the plants.

After the plants experienced these great temperature fluctuations they suffered a sunburn injury that desiccated the leaf margins and caused appreciable collapse of interveinal tissues. About 40% of the crop was adversely affected by these conditions and required several weeks to recover fully. Of the injured crop, 10% was replaced with new plants three to four weeks later. These new plants outgrew and out-produced those that were injured.

Powdery mildew (Erysiphe cichoracearum), usually the most serious disease of greenhouse cucumbers in this area, first appeared in one or two greenhouses in mid-April. Spread was gradual and a few traces of the disease could be found in most crops by June, at which time two or three outbreaks were too well established to be controlled with Karathane applied as a dust or by smoke generators. In such cases sprays containing 1/2 lb. Karathane/100 gal. water plus a sticker gave good control when thoroughly applied.

By mid-March the effects of inadequate soil sterilization were evident by an increase, over previous years, in the number of outbreaks of root knot nematode, Meloidogyne sp. and foot rot caused by Fusarium sp. "Nemagon" soil fumigant applied to growing plant effectively checks nematode development. At the rate of 9.7 Imp. pints/acre, 0.5 cc. applied by injector 4 in. from the base of each plant, spread of the nematode was halted and new plant growth developed. Some growers used the material on mature "hardened" plants at rates as high as 34.8 Imp. pt./acre without apparent phytotoxicity. Foot rot is most readily controlled by through steam sterilization.

Stem rot, caused by Botrytis cinerea and Sclerotinia sclerotiorum became quite prevalent during a period of warm weather in mid-April. On a few nights when outside temperatures rose to about 65°F. automatic heating systems set to operate at 65°-67°F. did not turn on. In the absence of circulating warm dry air, condensation formed on the plants affording ideal conditions for the spread of these stem rot organisms.

Adjustment of the greenhouse humidity to prevent condensation on plants and the use of ferbam or thiram applied as dusts, sprays or paste checked the disease spread. In two cases where Botrytis cinerea was was causing fruit rot, gross loss per acre was about $1200.00 when approximately 4% of the fruit were attacked. Sclerotinia sclerotiorum destroyed a few fruit in another crop.

The leaf spot caused by Trichothecium roseum occurred throughout the area causing slight to moderate damage, but one or two crops suffered severe defoliation. Maneb applied thoroughly once a week at 3 lb./100 gal. controls the disease.

Scab (Cladosporium cucumerinum) could be found wherever growers had allowed temperatures to drop long enough for condensation to form on the fruit. In one instance where the grower stopped heating his crop in early June severe scab lesions developed on about 75% of the fruit causing considerable loss.

In February and early March injury from agricultural chemicals occurred quite frequently.

(1) More than 2,500 cucumber seedlings planted in ground beds treated with DD soil fumigant suffered severe root injury before the concentration of the chemical dropped to a non-toxic level. Development of the crop was retarded three to four weeks, a delay that represented a considerable financial loss to the grower.

(2) Sprays containing 25% malathion wettable powder, 2 lb./100 gal. applied to young plants caused "burning" of the leaf margins and interveinal chlorosis. Malathion applied six weeks later to older plants still caused a marked necrosis of interveinal leaf tissue.

(3) Two applications of 50% Perthane wettable powder, 2 lb./ 100 gal. applied one week apart also caused a severe chlorosis of tissue. The injury was not apparent until after the second spray was applied.

(4) One spray of the acaracide Aramite, used at the rate of 2 lb./100 gal., was the cause of a severe interveinal necrosis occurring on leaves within a few days of application.

In most of the cases where injury occurred sprays were applied to plants that had been forced into lush growth at a time when low light intensity favored the development of very thin leaf tissue that was probably more subject in injury.

Fertilizer burn was seen in several crops where excessive amounts of chemical fertilizer were applied. Leaves were damaged and plants were killed from ammonia fumes rising from too fresh manure that was applied as a mulch in some crops.

A 600-plant crop growing in a small Leamington greenhouse was destroyed when dithio pyrophosphate smoke generators were ignited to control greenhouse red spider mites, Tetranychus sp., on a cloudy morning in June. The sun later shone brightly rapidly raising the temperature in the sealed greenhouse to over 90°F. In another crop the leaves on a number of plants were burned while being fumigated with HCN.

Other Observations

LEAF SPOT (Alternaria cucumerina). A specimen was submitted to the Charlottetown, P.E.I. laboratory for diagnosis. It is commonly seen in plantings in P.E.I. in recent years (D.B. Robinson).

GRAY MOLD (Botrytis cinerea). Infections were seen in May on about 10% of the stems in a greenhouse planting at Falmouth, N.S. (K.A. Harrison).

SCAB (Cladosporum cucumerinum) was observed as a 30% infection in a 4-acre field of pickling cucumbers at Paris, Ont. The field had grown 3 successive crops of cucumbers (B.H. MacNeill). It was prevalent in Queens and Sunbury counties, N.B. Early crops were sl. affected but the late crop bore heavy infections. Home garden crops were affected throughout the province (S.R. Colpitts). In the St. John River valley, N.B., varieties other than the Maine and Wisconsin resistant strains were affected (J.L. Howatt). In P.E.I. infection was at its lowest level in 8 years (J.E. Campbell). It was more common than usual in garden plantings in N.S. (K.A.H.).

WILT (Fusarium sp.). Specimens from the Montreal, Que. area were received for identification at Ottawa (V.R. Wallen).

ANGULAR LEAF SPOT (Pseudomonas lachrymans) was sl. in 1 field at Medicine Hat and tr. in 1 field at Countess, Alta. (J.E. Moffatt). Tr. infection was found in a planting at Ste. Eustache, Man. (W.A.F. Hagborg). It occurred in a 3-acre planting of pickling cucumbers at Kingsville, Ont. Infection was mod. except in one-half acre portion of the field sown to cucumbers the previous year. In that portion plants were stunted and the crop reduced by 50% (R.W. Walsh). It was 2% in a garden plot at Oromocto, N.B. (S.R.C.).

WILT (Verticillium albo-atrum) was tr. in a 2-acre field at Narrows, N.B. (S.R.C.).

MOSAIC (Cucumber mosaic virus) was prevalent in a home garden at Summerland, B.C. It occurs in that garden annually and greatly reduces yields (G.E. Woolliams). In the Harrow-Leamington area of Ont. the Burpee hybrid cucumber, considered tolerant to mosaic, was sev. affected. As well as exhibiting foliage mottling many of the fruits showed a pronounced mottling. Many tons of fruit were rendered unmarketable. A heavy melon aphid infestation was responsible for spread of the disease in cucumbers and to other crops such as muskmelon, squash and pumpkin (C.D. McKeen). A sev. outbreak at the Exp. Farm, Kentville, N.S. wiped out a series of trials of slicing varieties (K.A.H.).

CHEMICAL INJURY. Sev. chlorosis and marginal necrosis of many leaves resulted when cucumber vines were sprayed late in the day with tribasic copper sulphate 6 lb. and 25% malathion W.P. 2 lb./100 gal. water at Colchester South, Ont. At the same place seedlings were burned following the application of liquid fertilizer sprays in accordance with the manufacturer's directions (R.W.W.).

EGGPLANT

LEAF SPOT (Ascochyta lycopersici). Mod. infections were seen at Ste. Foy, Que. (D. Leblond).

GARLIC

BULB ROT (Fusarium sp.) caused the yellowing of foliage, decay of outer bulb scales and rotting of the roots in 80% of the plants in a one-sixth-acre planting at Harrow, Ont. The symptoms were observed early in June (C.D. McKeen).

LETTUCE

GRAY MOLD (Botrytis cinerea). A head lettuce crop at Melanson, N.S. was 30% infected on 23 May and a complete loss by early July. At New Minas, N.S. Botrytis rot associated with tip burn caused the loss of 300/2000 plants (K.A. Harrison).

DOWNY MILDEW (Bremia lactucae) was mod.-sev. in several large fields on muck soil at Ste. Clothilde, Que. (R. Crête).