Problems in Greenhouses

EMPERORS, status-seekers, the prominent, and such people have had greenhouses for a long time. For common folk, however, the problems of pests and diseases were too much until a few decades ago. Now growing vegetables, fruit, flowers, and other plants under glass is a well established commercial practice and an entrancing hobby within the reach in money, time, and space of many. Against the insects and diseases, people used—to little avail—sulfur, tobacco, quassia, handpicking, washing with soapy water, brushing to remove scales, and so on. They would start crops in the fall, grow them during the cooler seasons, and abandon them when the pests became unmanageable.

Research projects on greenhouse pests were started about 1915 in the Department of Agriculture and several State agricultural experiment stations. They led to the development of pot fumigation with sodium cyanide and calcium cyanide powder, refined oil-emulsion sprays to replace kerosene emulsion, fumigation with various substances, and derris and pyrethrum sprays. None of those materials changed growing practices very much. About 1945 we entered a new era in pest control, which began with the appearance of many organic chemicals, including DDT, lindane, chlordane, dieldrin, endrin, TEPP, parathion, and malathion. They were especially effective against thrips, cutworms, leaf rollers and other caterpillars, centipedes, millipedes, chrysanthemum and rose midges, leafhoppers, plant bugs, many beetles, aphids, whiteflies, mealybugs, and scale insects. The control of spider mites by TEPP, parathion, and later by Aramite, Kelthane, Tedion, and Dibrom has been a notable accomplishment. Lindane in the soil was the first chemical that controlled the root-feeding symphylans without damaging the plants; on the foliage, lindane is highly effective against thrips and aphids. Metaldehyde for slugs and snails and Kelthane and Thiodan for the cyclamen mite have given us the first safe and effective controls for these serious old pests.

The elimination or reduction of many injurious pests on vegetable and flower crops in the greenhouse has resulted from the use of these insecticides that kill by contact, after ingestion, or through long residual action. Vapors of some compounds applied to foliage give a prolonged local fumigation action when the ventilators are closed. Some compounds, as demeton and schradan, are systemic
poisons that may be applied to the soil, stems, or foliage and enter the plant. Most of these powerful new chemicals can be had as improved dusts, wettable powders, emulsion concentrates, aerosols, smokes, or concentrated sprays. Insects, nematodes, and disease organisms can be destroyed by steam sterilizing between crops; outmoded now is the former laborious practice of removing the soil from the bench and replacing it with new soil from the field.

By growing fewer crops in the greenhouse, the grower has greatly reduced the number of pests that he must combat. In this day of specialization, cuttings of chrysanthemums, carnations, poinsettia, and foliage plants are grown in a few places and supplied for scheduled planting dates to growers throughout the country. Occasionally certain pests, as the carnation shoot mite, spider mites, and leaf miners, are distributed widely on these cuttings and cause considerable damage before they are recognized and control measures are pursued. The newer chemicals and mechanical devices for automatic control of lighting, heating, ventilation, and watering have given the commercial greenhouse operator increased production per square foot of growing area and have improved the quality of flowers and vegetables. By controlling thrips and spider mites, he can now produce white roses and carnations for June weddings and late crops of tomatoes and cucumbers. That was almost impossible before modern insecticides were available. Efficient pest control has enabled him to take full advantage of new lighting and shading effects on plants and to produce crops throughout the year.

Floriculture and ornamental horticulture have changed a great deal in production practices during the past few years. Flowers grown in one part of the United States can be placed in markets in any other part of the country by overnight transportation. Keen competition exists between the northern operators of glass- or plastic-covered greenhouses and outdoor growers of the same crops in California, Florida, Hawaii, and other States that have long growing seasons. Specialists on Extension staffs in many States aid growers in developing more efficient ways of increasing production per square foot of greenhouse space by mechanizing growing operations and using better pest and disease controls and agricultural practices.

The present trend in building commercial greenhouses is to use plastic-covered houses as adjuncts to existing glass greenhouses. New greenhouse establishments and cloth-covered growing areas are being built in regions with favorable climate. Census reports indicate an overall increase of 50 percent in the valuation of crops and ornamentals during the past decade. This trend reflects the continued desire of American people for ornamental plants and healthy prospects for the future of commercial floriculture. Even more noteworthy is the construction of small greenhouses or conservatories
attached to private homes. One can spend considerable money for a greenhouse of masonry and glass, or one can erect a simple framework and cover it with plastic sheeting. Automatic controls for heating, ventilating, and watering take care of the plants during the owner's absence. (Floyd F. Smith)