CONDENSATE INJURY FROM BLACK PLASTIC

Richard H. Sciaroni, County Director and Farm Advisor, San Mateo County; Roy L. Branson, Extension Soils and Water Specialist, Riverside; and David L. Hanson, Farm Advisor, San Mateo County

The use of black plastic to control day length in producing cut and potted chrysanthemums is increasing in popularity. Mechanical systems for pulling the plastic have been developed, which make the use of this material even more attractive.

Recently a problem was investigated in a pot mum range in the Half Moon Bay area, where it appeared that condensate dripping onto the foliage was causing damage. There was minor to moderate foliage burn in most of the greenhouse. However, the foliage of entire plants was severely injured directly under the plastic that was pulled back and bunched. The pattern was consistent in all greenhouses where the problem occurred.

Considerable condensate was observed on the plastic. Condensate samples were collected and poured on a few chrysanthemum plants. The same type of injury occurred within about a week. The baffling part of the entire episode was that some greenhouses did not have the problem. This indicated that only certain lots of plastic were involved.

Samples of condensate and plastic were sent to the University of California at Riverside, and extensive laboratory tests were made. Condensate dripping from the galvanized gutters was also analyzed. These analyses and also some data on germination of radish seeds (see table) indicate that the condensate from the black plastic is the primary suspect.

EFFECT OF TWO CONDENSATE SAMPLES ON GERMINATION OF RADISH SEEDS

Date	Number of seeds germinated		
	Check (Riverside tap water)	Condensate collected from black side of cover, House 6	Condensate drippings from galvanized pan, House 6
6/10/75	Start	Start	Start
6/11/75	6	1	0
6/12/75	9	1	4
6/13/75	9	1	6
6/17/75	9	1	8
6/18/75	9	1	9
	Average length of roots		
6/13/75	3.0 cm	0.0 cm	1.9 cm
6/17/75	7.7	0.3	4.6

A spectrographic analysis of the black plastic condensate revealed the presence of 5 ppm cadmium. Cadmium is indicated as the cause of the problem since, even at 0.1 ppm in solution culture, cadmium is phytotoxic. Cadmium is widely employed as a stabilizer in plastics (to prolong the life by protecting against heat and light). The amount of cadmium that manufacturers can use is restricted in food containers but not in plastic for other uses.

We want to stress that this incident was apparently an isolated case. Black plastic is being used successfully in many greenhouses for day-length control. However, if foliage burn occurs on chrysanthemums grown under black plastic, the possibility that the problem is due to condensate drip on the plants should be evaluated.