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## **NEW LILY DEFLOWERING TREATMENT SHOWS PROMISE**

Plantings of the commercial Easter lily, *Lilium longiflorum*, are seldom allowed to reach full bloom, the flower buds being snapped or cut off by hand some days or weeks beforehand. There are several reasons for this treatment, paramount of which is an attempt to reduce the spread of "fire," *Botrytis cinerea*, from the soft flowers down onto the foliage. Early bud removal also tends to shorten the plant, which is an advantage in cultivation. If the buds are removed as soon as they appear, bulb size can even be enhanced.

Drs. Neil Stuart of the United States Department of Agriculture, Beltsville, Maryland, working with 'Georgia' lilies and Larry Blaney of Oregon State University, using 'Ace' and 'Croft' lilies several years ago tested various chemical sprays for deflowering lilies at very early stages of flower development. They found CIPC (chlorpropham) sprays to be very effective if applied at the right time in proper concentration. A 1500 ppm CIPC spray with 235 ppm Triton B1956 spreader, applied when the flower buds were the size of peas, prevented flowering and reduced plant height by half. Bulb weights were also significantly increased and without reducing in any way subsequent forcing performance. The only detrimental effect of the spray was some spotting and necrosis of the terminal leaves directly under the remaining bud scars. These necrotic spots were thought to be a possible point for *Botrytis* invasion, hence the spray was never considered entirely safe for commercial use. The need for a reliable deflowering spray has continued, and a successful one would be of considerable economic value to the bulb grower.

While traveling in Japan in 1970, Dr. Harold Wilkins of the Department of Horticulture, University of Minnesota, St. Paul, Minnesota, observed lily deflowering tests being made with two Atlas Chemical Co. surfactants, Atlox 3404F and Tween 20, in various combinations. He brought back two papers describing their results in Japanese. After translating these papers into English, we decided to compare their best Atlox 3404F/Tween 20 sprays with our best CIPC treatment. The comparison was made at the Pacific Bulb Growers' Research and Development Station at Harbor, Oregon, using 30 to 40 gm planting stock of the cultivars 'Ace' and 'Nellie White.' This closely sized planting stock was planted in October of 1970 in standard commercial fashion.

The three spray combinations (Fig. 1) of Atlox 3404F and Tween 20 and the CIPC treatment (1500 ppm CIPC, plus 235 ppm Triton B1956 spreader) were applied to the foliage until run-off in a series of 20-plant plots on May 7, May 23, and June 6. The 'Ace' and 'Nellie White' plots were in adjacent rows. On May 12 the largest 'Ace' and 'Nellie White' flower buds averaged 3.3 and 3.1 mm in diameter, respectively, and on June 10, 9.6 and 9.8 mm.

The effects of the sprays on the above-ground portions of the plants were evident throughout the growing season. The subsequent effects of the various treatments on percent deflowering, plant height, and final bulb weight is evident in Figures 1, 2, and 3. On September 13, the bulbs were harvested and stored for future greenhouse observation during forcing.

It is evident that timing is an important factor in the deflowering effectiveness of the spray combinations (Fig. 1). It is apparent that the two later sprays, May 23 and June 6, were more effective in aborting the buds than the one applied earlier. When treated on May 23, all sprays were more effective with ‘Nellie White’ than ‘Ace.’ When properly timed, the Atlox/Tween sprays were as effective as CIPC on ‘Nellie White’ but not ‘Ace.’ Possibly a higher concentration was needed. Visually, the CIPC spray was more phytotoxic to the upper leaves (necrotic spots) than the new Atlox/Tween combinations. The effectiveness of the several spray treatments in deflowering is reflected in the corresponding reductions in plant height (Fig. 2). The CIPC and Atlox/Tween sprays were very effective in reducing plant height as compared to the controls.

The effectiveness of these new spray combinations in deflowering ‘Ace’ and especially ‘Nellie White’ with little or no foliage damage is encouraging enough to warrant further refinements in the treatments. A more extensive study of spray concentrations and timing as related to bud development and weather conditions is in order.

**Figure 1. Effectiveness of deflowering treatments on ‘Ace’ and ‘Nellie White’ lilies during the 1971 season. Percentage of plants completely deflowered.**

<i>Treatment Combination</i>				<i>‘Ace’</i>			<i>‘Nellie White’</i>			Average
Tween	Atlox			Date Applied		Date Applied				
20	3404F		5/7	5/23	6/6	5/7	5/23	6/6		
ppm	ppm			percent		percent				
1. 2,500	+ 5,000	-----	10	5	40	5	100	100	43	
2. 5,000	+ 10,000		5	35	55	30	100	90	53	
3. 6,000	6,000	-----	15	65	20	30	100	50	47	
Controls										
4. *CIPC-1,500	ppm		55	90	100	95	100	100	90	
3. No treatment	-----		0	0	0	0	0	0	0	
	Average-----		17	39	43	32	80	68		

\*Effective CIPC treatment established in earlier trials: includes 235 ppm Triton B1956 spreader.

**Figure 2. Effects of deflowering sprays on height (cm) of ‘Ace’ and ‘Nellie White’ lilies during the 1971 season**

Treatment Combination				‘Ace’			‘Nellie White’			Average
Tween 20 ppm	Atlox 3404F ppm			Date Applied centimeters			Date Applied centimeters			
			5/7	5/23	6/6	5/7	5/23	6/6		
1.	2,500 +	5,000 -----	10.2	14.0	17.8	19.1	19.1	20.3	16.8	
2.	5,000 +	10,000 -----	12.7	14.0	16.0	14.0	17.8	17.8	15.4	
3.	6,000 +	6,000 -----	10.2	15.2	15.2	17.3	15.2	16.5	14.9	
4.	Controls		9.7	12.7	15.2	16.0	12.7	14.0	13.4	
*CIPC-1,500 ppm -----										
No treatment -----			19.8	20.3	22.9	25.4	20.3	20.3	21.5	
Average-----			12.5	15.2	17.4	18.4	17.0	17.8		

\*Effective CIPC treatment established in earlier trials; includes 235 ppm Triton B1956 spreader.

**Figure 3. Effects of deflowering treatments on average bulb weight (grams) of ‘Ace’ and ‘Nellie White’ lilies at harvest. (September 13, 1971)**

Treatment Combination.				‘A ce’			‘Nellie White’			Average
Tween 20 ppm	Atlox 3404F ppm			Date Applied grams			Date Applied grams			
			5/7	5/23	6/6	5/7	5/23	6/6		
1.	2,500 +	5,000 -----	108	124	142	130	130	130	127	
2.	5,000 +	10,000 -----	102	124	130	124	142	136	126	
3.	6,000 +	6,000 -----	108	125	119	125	125	130	122	
4.	Controls		108	119	148	108	114	134	122	
*CIPC-1,500 ppm -----										
5. No treatment .....			108	103	136	114	119	119	117	
Average -----			107	119	135	120	126	130		

\*Effect EIPC treatment established in earlier trials; includes 235 ppm TritonB1956 spreader.

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