1-to-8 reduced the numbers of buds by only 26%, and caused no other significant loss. None of the bug-to-bud ratios decreased the size or viability of seeds. Data from another experiment on one of the new, thin-hulled stripe varieties of safflower showed that it may be more sensitive to the feeding of lygus bugs and suffer a greater seed loss.

All of the experimental evidence obtained to date show that dense populations of lygus bugs must be present to cause important bud blasting (table 2) and economic loss of seed. Serious seed losses occur only when 60 or more lygus bugs per sweep are present (equivalent to 1 lygus per 4 buds). Treatment with insecticides does not appear to be worth while until 25 to 30 lygus bugs per sweep can be taken (a ratio of 1 lygus per 8 buds).

Plant compensation

An investigation was also made to determine what correlation, if any, exists between seed yield and bud loss due to insect feeding. An evaluation was made of the effect of reducing the number of buds, seed heads, or the amount of foliage on the production of seeds (numbers, size, viability, and yield).

The data from the prebloom disbudding, deheading, and defoliation experiment (table 3) showed that 50% disbudding caused very little decrease in seed head development. Removal of 100% of the buds (leaving only the large seed heads) significantly reduced the number of seed heads finally produced. However, this was accompanied by a significant increase in the diameters of seed heads, the weight and number of seeds per head, and in the size of seeds—resulting in no reduction in the final yield of seed. The variety U.S. 10 thus appeared to sustain a 100% loss of buds prior to onset of bloom and yet produce a normal yield of seed.

When 100% of both buds and seed heads were destroyed before bloom, the final seed yield and viability of those seeds finally produced was significantly reduced. Complete defoliation at this time (lower photo, page 3) also seriously impaired seed production. Results of a similar experiment begun two weeks later (at onset of bloom) are also included in table 3, and showed that disbudding and deheading at this late date caused even greater head and seed losses. Loss of both buds and heads at this stage was so severe that the plants could produce very few heads, and seed yields, size, and viability were seriously affected.

The recuperative ability of this variety was clearly demonstrated. The results agree very well with field work in demonstrating that moderate infestations of thrips and lygus bugs do not appreciably depress yields of safflower seed. Economically significant seed losses related to insect feeding and blasting of buds were not evident until very high numbers of insects were present and bud losses were between 38 and 45%.

Insecticides

The effect insecticidal control of thrips and lygus bugs might have on plant damage and seed yield was also investigated. Periodic samplings of the insect populations within the field plots on the variety U.S. 10 indicated that all of the pesticides applied prior to the onset of bloom gave excellent control of the lygus bugs, but only a fair degree of reduction in numbers of flower thrips. Very large percentages of the buds showed symptoms of injury attributable to either or both of these pests. The damage attributable to flower thrips, and classified as severe (browned, blasted, or dead buds), was greatly reduced in each of the spray plots. Severe damage to buds by lygus bugs amounted to approximately 1% and was not obviously reduced by any of the sprays.

Although the amount of severe bud damage due to thrips was greatly reduced by the insecticides, there were no corresponding increases in the crop production estimates. In this trial, the amount of severe bud damage—as high as 32%—was below the 50% allowable level and little benefit was obtained by spraying.

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TABLE 3. THE EFFECTS OF DISBUDDING, DEHEADING, AND DEFOLIATION ON SAFFLOWER PLANTS, DAVIS, 1963

Treatments	Averaged production values				
	Number of good seed heads per plant	Diameter of seed heads in inches	Weight of seeds per seed head in grams	Weight of seeds per plant in grams	Weight of 100 seeds in grams
	Treated 13 days before bloom*				
Check	38.8 c	0.94 b	1.31 b	48.5 b	3.76 b
50% Disbudded	32.5 bc	0.97 bc	1.53 b	49.9 b	3.74 b
100% Disbudded	20.0 a	1.09 c	2.42 c	48.3 b	4.85 a
100% Disbudded + Deheaded	21.1 a	0.80 ab	1.08 ab	21.8 a	3.75 b
100% Defoliated	25.5 ab	0.72 a	0.77 a	19.9 a	3.26 bc
	Treated at the onset of bloom†				
Check	40.5 d	0.94 b	1.37 b	54.8 c	3.95 b
50% Disbudded	27.6 c	0.95 b	1.67 bc	46.0 bc	4.39 b
100% Disbudded	15.5 b	0.99 b	2.27 c	35.5 b	4.37 b
100% Disbudded + Deheaded	5.2 a	0.21 a	0.36 a	2.2 a	1.70 a

* At this time the correct percentages of buds, seeds, and foliage per plant were adjusted according to plan.

† The plants were 10% into bloom when the given manipulations were made.

EASTER LILIES GROW TALLER AT CLOSER SPACING

IT HAS BEEN observed in previous studies that Easter lilies grow taller at lower light intensities. From data recently collected at the Los Angeles campus, it was also found that closer spacing is equivalent to lower light intensity insofar as height is concerned. The data summarized in the graph indicate that plants from commercial-size bulbs were of minimum height when 100 sq inches or more were allowed per plant. At higher light intensities, this critical value would be expected to be lower and at lower intensities, higher.—*Harry C. Kohl, Jr., and R. L. Nelson, Department of Landscape Horticulture, University of California, Davis.*

EFFECT OF PLANT SPACING ON STEM LENGTH OF EASTER LILIES