

New Selective Herbicide Tested

CDEC applied in pre-emergence treatment of seeded lettuce shows promise for selective weed control without crop injury

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Precision cultivation and hand hoeing—the methods now used for weed control in lettuce production—become difficult where weed growth is thick and rapid. The lettuce may be overgrown to the point where cultivation is difficult and the lettuce suffers heavily from weed competition.

Reports from Arizona indicated that among several herbicides tested by research workers there, CDEC—vegadex—appeared promising for selective control of purslane in seeded lettuce. Subsequently, trials were initiated in the Chino area of San Bernardino County, with four varieties of lettuce—red leaf, salad bowl, butter lettuce, and romaine—and with endive.

The herbicide—CDEC—was applied with a sprayer at concentrations ranging from 0.6 pound per acre to 10 pounds per acre. Spray volume was kept constant at 100 gallons per acre.

The soil was Chino clay loam and had been well worked during shaping of the beds so that no large clods remained. CDEC was applied the day following seeding. Immediately after application of

the herbicide the beds were subirrigated until the entire soil surface was wet.

Weed counts were made 18 days after spraying. Rating for crop injury was made 18 days after spraying and again at maturity.

Weed Growth

Rates of CDEC below five pounds per acre did not visibly reduce weed growth and were considered ineffective. How-

ever, weed growth was reduced visibly in the 5–10-pound range although no breaking point was evidenced between partial and complete control. Complete control was not obtained even at the 10-pound rate.

Weed counts were made on the area covered by rates from 6–10 pounds per acre and were divided into broad-leaved species and grasses. Broad-leaved weeds consisting of lambsquarter, purslane, and a few pigweed were in the cotyledon and two-leaved stage. Grass was $\frac{1}{4}$ "–1" tall and, as indicated by growth in surrounding areas, was watergrass—*Echinochloa crus-galli*. The treatments were replicated 10 times in a randomized block design.

Counts of broad-leaved weeds and grasses were analyzed statistically. There was a difference in broad-leaf weed growth between CDEC-treated plots—in the 6-pound to 10-pound-per-acre range—and control plots which was statistically significant at the 1% level. The difference in grass counts between CDEC and control plots was statistically significant at the 5% level.

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Replicate	Weed Counts			
	CDEC		Control	
	Broad-leaved	Grass	Broad-leaved	Grass
1	65	2	110	20
2	20	0	119	3
3	5	0	78	9
4	21	0	80	10
5	56	0	91	0
6	40	2	85	1
7	2	0	49	1
8	13	1	51	2
9	64	1	80	16
10	14	2	63	42
Total	300	8	806	104
Ave.	30	0.8	80.6	10.4

No injury on romaine treated with CDEC at 10 pounds per acre. Treated on left of center, untreated at right.



Use of IBA was definitely beneficial in rooting plum cuttings in each of the three instances where untreated controls were included. The photograph on page 14 shows typical root systems which developed from the cuttings of the varieties used in the 1957-58 tests.

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TREE SHAKING

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Fruit removal was found to be affected primarily by four variables: 1, the frequency of the shake; 2, the stroke; 3, the force required to remove the fruit divided by the weight of the fruit—F/W—and, 4, by the number of limber fruit bearing hangers in any given tree.

The upper graph on page 3 shows the relationship of stroke and frequency with fruit removal. At low frequencies there is a large difference in the percent removed by use of the various strokes.

However, at higher frequencies the difference is small. The relationship represents the average removal that could be expected, but any particular tree or group of trees might vary from this as a result in the effect of F/W and the number of limber fruit bearing hangers.

No attempt has been made to isolate the effect of F/W or the number of limber hangers. However, F/W, which is the number of g's—unit weight—acceleration required, is of importance because fruit removal by shaking is the result of accelerating the limb away from the fruit. With regard to the limb characteristics, it was found that the percent of fruit removed was less on trees having several limber hangers than on rigid type trees with few hangers.

Tree damage tests indicate that limb breakage increases with increasing stroke. However, minimum damage occurred within a frequency range of 700-900 cpm. The damage may be greater when using a higher or lower frequency. All combinations of frequencies and strokes are possibly acceptable to growers, although the long stroke with a low

frequency causes the tree tops to whip which increases limb breakage particularly on old brittle trees.

A number of years observations are needed before final judgment on possible root damage caused by shaking can be made. However, visual observations made in these studies indicate that boom shakers may cause less tree damage than cable shakers.

Further studies are planned to evaluate the effect of the position of the clamp on the limb, and the F/W on fruit removal and power required.

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CDEC

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Crop injury was rated in terms of stand reduction and stunting of growth. Stand reduction at the 18-day rating was based on the unthinned stand. The rating at maturity was based on the stand left after hand thinning. Normal field thinning eliminated any evidence of stand reduction caused by CDEC.

Crop Injury from Treatment with CDEC

Variety	Stand reduction		Stunting	
	18-day	Mature	18-day	Mature
Red leaf	None	None	None	None
Salad bowl	None	None	2%-5%	None
Butter lettuce	5%	None	5%	None
Romaine	None	None	2%-5%	None
Endive	None	None	None	None

Stunting consisted of a slight curling and twisting of the leaf margins. This symptom appeared on only the first leaves and later leaves were normal. At maturity no differences between the treated and the untreated plants were observed.

Complete weed control was not obtained with CDEC at rates up to 10 pounds per acre, but the results—although from only one test in one area—warrant further trials with the herbicide as a method of selective weed control for pre-emergence treatment of lettuce.

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H. F. Arle, Field Crops Research Branch, USDA, Phoenix, Arizona, and W. D. Pew, Arizona Agricultural Experiment Station, reported the experiments conducted in Arizona.

The Fujiwara Brothers, ranchers in the Chino area, cooperated in the experiment with CDEC.

The above progress report is based on Agricultural Extension Service Project No. 4188.

CYANAMID

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the treated area introduces a new source of weed infestation.

In moist, sandy loam soils, planting was started 8-10 days after treatment, but in heavier soils a waiting period of two weeks after irrigation or rainfall was found necessary.

The observations made at the test plots were verified in commercial field treatments.

The amount of cyanamid applied varies with the distance between beds and the width of band treated. A rate of 1,500 to 2,000 pounds per acre is

required but the amount actually applied depends on the treated portion of the field. If two 6" bands of cyanamid are applied to 36" beds only one third of the soil is treated. Therefore, between 500 and 666 pounds applied meet the required rate of 1,500 to 2,000 pounds per acre.

Because cyanamid contains 21% nitrogen, the cost of the treatment—\$25-\$30 per acre for material—was divided equally between nitrogen fertilizer and weed control.

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Calcium cyanamid applicator and mulcher units mounted on same tractor used in treatment for weed control.

