

# Herbicides on White Potatoes

weed control field trials with seven herbicides conducted in San Bernardino County with varying results in effectiveness

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**Designed** to observe the tolerance of white potatoes for herbicides applied for weed control, a series of trials was conducted in commercial fields.

Seven herbicides — NPA, CDAA, CDEC, neburon, monuron, diuron, and simazin—were included in the trials. Each test was replicated four times in a randomized block design. Herbicides were applied over a range of rates designed to produce injury at the higher concentrations in order to determine the margin of safety between the amount of herbicide required for satisfactory weed control and that which would injure the crop plant. However, with some materials no injury occurred at maximum rates. Rates for NPA, CDAA, and CDEC ranged from 0.6–10.0 pounds per acre. Rates for neburon, monuron, diuron, and simazin ranged from 0.24–4.0 pounds per acre.

Applications were made with a dilution sprayer which permitted variations in the concentration of the herbicide but kept the spray volume constant at 100 gallons per acre.

The soil of the test plots is a Hanford fine sandy loam, which was well worked prior to planting so no clods remained. Rain fell the day after planting, and the herbicides were applied the next day on moist soil. During the following 10 days a little over 2" of rain fell.

With the exception of cultivation, all cultural practices were the same in treated and check plots.

NPA caused a delay of 4–5 weeks in the sprouting and emergence of the seed tubers at all rates. At harvest, vine growth almost equalled that of the controls. However, tuber formation was greatly reduced at all rates.

Monuron caused moderate stunting of top growth of young plants at rates above 3.0 pounds per acre. Tuber formation was reduced at rates above 1.7 pounds per acre.

Simazin caused an early stunting of top growth at all rates tested. This effect was outgrown and the vines appeared equal to the check at harvest. Tuber formation was greatly reduced at rates above 0.5 pound per acre.

Diuron caused an early stunting of top growth at rates of 3.5 pounds per acre and above and reduced tuber formation at rates above 1.9 pounds.

Herbicide	Rates Tested (lbs. per acre)	Breaking Point for Crop Injury (Average of four replicates)	
		Top Injury	Tuber Injury
CDAA	0.6 to 10	None	None
CDEC	0.6 to 10	None	None
NPA	0.6 to 10	Delayed sprouting of seed tubers 4 to 5 weeks	Reduced tuber formation at all rates
Neburon	0.24 to 4	None	None
Monuron	0.24 to 4	Stunted top growth of young plants above 3 lbs./acre. Injury soon outgrown	Reduced tuber formation above 1.7 lbs./acre
Diuron	0.24 to 4	Stunted top growth of young plants above 3.5 lbs./acre. Injury soon outgrown.	Reduced tuber formation above 1.9 lbs./acre
Simazin	0.24 to 4.0	Stunted top growth of young plants at all rates tested. Injury outgrown.	Reduced tuber formation above 0.5 lb./acre

Herbicide	Weight of Potatoes	
	Rates (lbs. per acre)	Average Weight of Tubers 4 Reps (lbs.)
NPA	5.1 to 7.1	11.83
Simazin	0.9 to 1.3	24.44
Control		31.54
Monuron	0.9 to 1.3	35.13
CDAA	5.1 to 7.1	37.63
Neburon	1.7 to 2.4	38.44
Diuron	0.9 to 1.3	38.63
CDEC	5.1 to 7.1	38.75

CDAA, CDEC, and neburon produced no adverse effects on either vines or tubers. Results on breaking points for injury on each herbicide are given in the table.

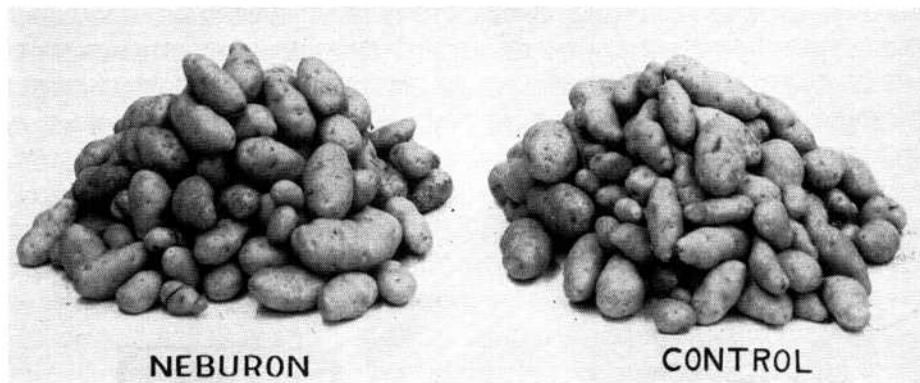
At harvest, weights were taken of the yield from a 6' strip in each replication. Since the rate of herbicide constantly changed along the length of the plot, the rate within the 6' strip varied. The position of the 6' length was chosen on the basis of concentrations which covered an area of acceptable weed control or, in cases where no weed control was achieved, on the basis of rates which have

been known to give weed control. Weights for each herbicide as well as the concentration ranges are given in the table. Yields of the NPA and simazin plots were significantly lower than the untreated check. Yields of all other treatments did not differ significantly from each other or from the check plots.

Weed growth—lamb's-quarter, pig-weed, and watergrass—was controlled by monuron, diuron, and simazin at rates above 0.5 pound per acre. Neburon gave good weed control at rates of two pounds per acre and above. CDEC at

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No adverse effects from neburon were observed.



# Management of Second Growth Stands of Douglas-fir

*Recent studies by Rudolf F. Grah, Specialist in Forestry, University of California, Berkeley, show the effect of low stand density on quantity and quality of yield.*

One of the common problems of modern timber management is that some lands tend to regenerate after cutting with far fewer trees per acre—low stand density—than were in original stands at similar ages.

Data on quantity and quality of yield of Douglas-fir were analyzed to show that, within the range of initial stand densities considered, the net harvestable volume is not significantly affected by stand density. On the other hand, quality as measured by knot size and amount of

excessively fast grown wood was shown to be very greatly affected by density. From an economic viewpoint, stands grown at low initial densities yielded a soil expectation value of \$44 per acre less than those of full density. Three general conclusions are drawn which have application to current management practice: 1. Low initial density reduces financial value of Douglas-fir stands; 2. Fill-in planting and pruning to overcome quality deficiencies are effective and profitable investments; and 3. Stand improvement investments are most profitable on the better sites, and those sites should be given priority in the allocation of funds.

## STRAWBERRY

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southern California probably can not be delayed as long as those for Lassen.

The Solana strawberry apparently requires a longer minimum growing period, during the establishment season, if optimum performance is to be realized. Also, Solana probably should be established with stored plants and the plantings made early in the summer, compared to Lassen. Winter planting of Solana is not recommended.

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*The above progress report is based on Research Project No. 1387.*

## RANGELAND

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CIPC, were used. Residues from such herbicides may be injurious to perennial grass species seeded at a later date unless rapid breakdown of the chemicals occurs. Complete elimination of some resident annual grasses may not be desirable because certain grass species, such as soft chess, provide food forage. However, reduction or elimination of weedy grasses would greatly improve the range, particularly if followed by the introduction of desirable annual clovers or perennial grasses. The effect of applying legume selective herbicides such as EPTC and CIPC not only failed to damage the seeded rose clover but also resulted in a greater cover of native annual legumes.

The promising results of this investigation justify further work on the prob-

lem of reducing competition during seedling establishment of annual rangelands by the application of pre-emergence herbicides.

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## POTATOES

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rates above five pounds per acre provided control of broadleaved weeds and grasses for a period of three weeks. NPA and CDAA failed to provide adequate control. This may have been due in part to a rapid leaching of these materials from the upper soil. Yellow nutgrass which was present was not controlled by any of the herbicides tested.

Neburon and CDEC were the only herbicides which provided weed control with no injury to the potatoes at the highest rates used. Simazin caused a reduction in tuber formation at concentrations which fell in the range best suited for weed control. Monuron and diuron, while controlling weeds, left a narrow margin of safety for the crop plant. CDAA and NPA failed to provide adequate control under conditions of the field trials.

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*Growers Ralph and Robert Broady of Chino cooperated in the field trials.*

## COTTON

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and higher supports during the past few years. If farmers take full advantage of the allowed acreage, greater surpluses than ever may be in prospect for the immediate future, in spite of reduced price support levels.

The United States gained only about 6% in cotton production and consumption between two five-year periods—from 12.9 million bales produced, and 12.1 million consumed in 1935–1939 to 13.7 and 12.8 million in 1953–1957.

Foreign use of United States cotton declined about 6%—1.0 million bales—but a 29% increase in United States use—2.0 million bales—offset this drop and resulted in a 6% gain in world-wide consumption between the same periods.

The rate of growth in the world cotton market has slowed, and little change has occurred since 1955, although foreign production has tended to expand as United States cotton output contracted.

United States cotton growers lost ground in the world market in the period beginning just before World War II, a disadvantage that is both absolute and relative. The United States is selling less cotton abroad now, in spite of the fact that foreign consumers are using more total cotton. The one major change that has prevented a still worse position for California and United States growers is increased consumption in the domestic market. However, both per capita and total bale consumption in the United States have declined since 1955.

The facts relative to the cotton situation are quite important to California and United States growers as they consider whether to elect Plan A or Plan B for the 1959 and 1960 seasons. At the upper extreme, if all growers chose Plan B and obtained yields equal to those in 1958, the result would be an overwhelming surplus. Plantings might reach about 22,834,000 acres; an average yield of 470 pounds of lint per acre would mean total production at about the 21.5 million bale level. The estimated 1958–59 disappearance—about 12.25 million bales—would still leave about 9.5 million bales to add to the August 1, 1959, carryover of 8.7 million. The result would be that carryover into 1960–61 would be over 18 million bales—an unworkable figure that would undo all progress in recent seasons toward working off surpluses.

To be continued

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