

SUMMARY OF JOHNSONGRASS CONTROL RATING FOR 52 WEEKS, AFTER REPEAT AND SINGLE APPLICATIONS OF MSMA AND DALAPON, IN A SUTTER COUNTY PEAR TRIAL

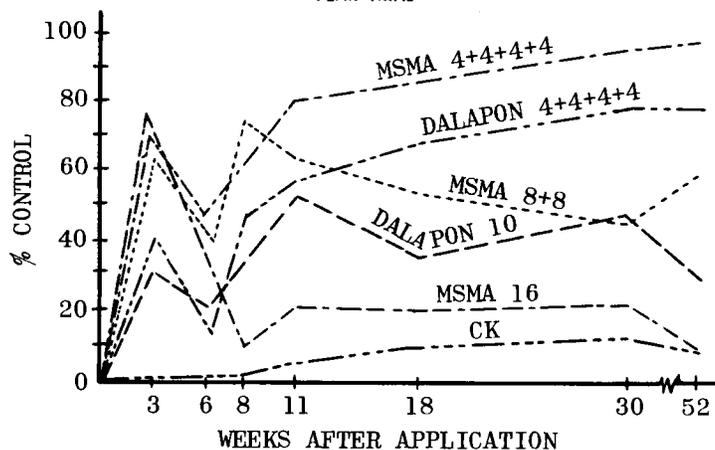


TABLE 1. EFFECT OF REPEATED SPRAYS ON JOHNSONGRASS CONTROL

Herbicide	Rate: lbs/A	Number of applications*	Average per cent control†
MSMA	4	5	99
MSMA	8	3	76
MSMA	16	2	19
Dalapon	4	5	76
Dalapon	10	2	27
Control	3

* One application applied in September, 1964. Four applications at 4-week intervals were made in 1965.
† Average of 2 trials each with 4 replications.

TABLE 2. EFFECT OF REPEATED SPRAYS ON JOHNSONGRASS CONTROL IN DECIDUOUS FRUIT ORCHARDS, 1965.

Herbicide	Rate: lbs/A	Number of applications	Average per cent control*
MSMA	4	3-4†	85
MSMA	8	2	70
MSMA	16	1	37
Dalapon	4	3-4†	65
Dalapon	10	1	48
Control	14

* Average of 7 trials at various locations, each with 4 replications.

† Includes 5 trials with 4 applications per season and 2 trials with 3 applications initiated in spring, 1965.

A severe infestation of Johnsongrass in a three-year-old prune orchard in Sutter County.



Progress report on JOHNSONGRASS

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JOHNSONGRASS is presently controlled in orchards by disking and hand hoeing around the trees—at considerable expense. To control and ultimately eradicate Johnsongrass in orchards, it is necessary to kill the underground rhizomes. This is difficult, particularly around the base of the tree where the source of reinfestation cannot be reached with a disk.

Chemicals such as dalapon have given partial Johnsongrass control in orchards, usually with sufficient safety when the correct rate and timing of irrigation have been practiced—except in citrus, where tree injury does occur. Because of the high solubility of dalapon in water, immediate irrigation has also resulted in injury to young deciduous trees.

In the fall of 1964, a series of uniform trials comparing dalapon and the organic arsonate herbicide, monosodium methane arsonate (MSMA), was initiated in orchard crops. The treatments included 4-lb

applications of MSMA repeated at monthly intervals and compared with similar dalapon applications. Other treatments were dalapon at 10 lb/A and MSMA at 16 lb/A. Two and three applications of MSMA at 8 lb/A were also compared. The 1964 fall trial was repeated the following spring (table 1), and a similar group of treatments was started in the spring of 1965 (table 2). Herbicides were compared on an active pound-per-acre basis in 200 gallons of water per acre. All dalapon sprays included a 0.5% addition of surfactant X-77. The MSMA used was a commercial formulation, also containing surfactant.

Repeat applications of MSMA at 4 lbs/A gave outstanding Johnsongrass control as shown in tables 1 and 2. Both fall- and spring-initiated trials gave excellent weed control at the repeated 4-lb rates.

Two 8-lb applications gave generally good Johnsongrass control but not equal to the repeated 4-lb treatments. The single 16-lb application, although providing excellent "burn-down," was essentially ineffective in preventing Johnsongrass regrowth.

Dalapon also gave much better control in repeated 4-lb applications than in a single 10-lb application. None of the dalapon treatments gave good control of regrowth. In uniform trials in peach, prune, citrus, walnut, and pear orchards, no phytotoxicity symptoms were observed in this series. However, some injury to shoots was observed in one trial on plum cuttings in the nursery row at rates of 4 and 16 lbs of MSMA and dalapon applied with a directed spray. Pear liners at the same location did not show injury at similar rates (table 3). Less injury was observed on older plant tissues of liners.

Root and top weights of deciduous fruit

CONTROL IN ORCHARDS

Johnsongrass, *Sorghum halepense*, is the most serious perennial weed control problem in California orchards. This fast-growing, warm-season weed propagates prolifically from seed and underground rhizomes. The fleshy underground stems provide the necessary overwintering mechanism by which this plant gets an early start in competing with crop plants, as well as other weeds. In established trees and in young, producing orchards, competition from Johnsongrass may reduce nutrients, moisture, and light. In a field test at the Kearney Field Station, Fresno County, Johnsongrass seedlings were controlled in the nursery row with various soil-persistent herbicides. MSMA is not currently registered (or recommended by University of California) for orchard use. Dalapon is not registered for use on walnuts or almonds.

seedlings were not affected by a soil application of MSMA up to 64 ppm in greenhouse studies. No injury was seen on Nonpareil and Mission almonds, plum, cherry, Royal apricot, Lovell, Rio Oso Gem, and Elberta peach, or on French and Sugar prune. However, with similar rates of dalapon in the experiments there was an indication of fresh weight reduction of some varieties, including Nonpareil almonds, Lovell peach, and Royal apricot.

In tests in California orchards, repeated MSMA applications have given outstanding Johnsongrass control. Although eradication was achieved only in one experiment, a high degree of control was obtained at most locations. Repeated small applications of MSMA have given consistently better control than fewer applications at higher rates. Although no phytotoxicity was noted in established trees during these trials, small, repeated applications also reduce the hazards of residues and phytotoxicity. The only injury observed with MSMA was found in nursery plants. Where Bermudagrass and

Johnsongrass were growing together, Bermudagrass was released when Johnsongrass was controlled because Bermudagrass is tolerant of MSMA. Dalapon in small repeated applications was consistently better than single applications in orchard crops. On a pound-for-pound basis, dalapon was not as effective as MSMA. Dalapon, like MSMA, showed no injury on bearing fruit trees in the uniform trials. However, dalapon has produced injury from root uptake when applied on two-year-old trees in sandy soils, under sprinkler irrigation. Dalapon, at the same concentration, produced more injury in greenhouse studies on most deciduous fruit seedlings than did MSMA. There were no indications in greenhouse studies that MSMA is taken up by roots of deciduous fruit seedlings.

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TABLE 3. THE EFFECT OF SINGLE DIRECTED SPRAYS ON THE FOLIAR CONDITION OF BARTLETT PEAR LINERS, MARIANNA PLUM CUTTINGS, AND TROYER CITRANGE LINERS

Herbicides	lbs/A	Phytotoxicity*		
		Pears† 1 Mo.	Plums‡ 1 Mo.	Citranges§ 3 Mo.
Dalapon	4	0	2.0	..
Dalapon	16	0	3.5	..
MSMA	4	1.2	3.2	0
MSMA	16	0	5.8	1.3
Check	0	0	0.5	0.5

* Phytotoxicity rating: 0 = no effect; 10 = all dead.
† 1-year-old liners when planted, i.e., about 20 months old from seed.

‡ Shoots of plum cuttings were about 3 months old at treatment.

§ Citrange liners were about 12 months old at treatment.



Johnsongrass control the season following repeated applications of 4 lbs/A MSMA. Note untreated area in background.

Reinfestation of Johnsongrass control plots by Bermudagrass.

