JOHNSONGRASS CONTROL STUDY IN VINEYARDS BY LAYERING TECHNIQUES

PROGRESS REPORT

AGRICULTURAL EXTENSION UNIVERSITY OF CALIFORNIA

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JOHNSONGRASS CONTROL STUDY IN VINEYARDS BY LAYERING TECHNIQUES

Progress Report

Johnsongrass (Sorghum halepense L.) is a major weed control problem in California vineyards. The nontilled vine row is an excellent place for Johnsongrass to thrive and increase throughout the growing season. The weed competes heavily in young vineyards, shading the vines, causing yield and quality loss, and increasing harvest costs. Repeated foliar applications of postemergence herbicides like dalapon control Johnsongrass, but the difficulty of proper timing in conjunction with other vineyard practices makes this a less desirable type of control.

This study's object was to evaluate the layering technique of herbicide application for Johnsongrass control. This technique uses a spray blade or French plow to place a horizontal layer of herbicide 4 to 6 inches below the soil surface. Prepared soil is necessary for successful operation of the spray blade. In this study, preparation included French plowing heavy Johnsongrass infestations.

Herbicides were applied between February 14 and May 5, 1971 in five field experiments at two locations by the two layering techniques: the spray blade; and after French plowing, followed by discing. At one location these techniques were compared. At the other location, a combination of spray blade and French plow was compared with the spray blade alone.

Standard rates of 2 and 8 pounds were used in most tests. Double rates were also evaluated in two tests. All herbicides were the commercial formulation -- i.e., either emulsifiable concentrate or wettable powder.

The layering technique showed considerable effect on Johnsongrass (tables 1 to 4). While the visual control ratings are low -- generally poorer than the commercial control rating of 7 on a scale of 0 to 10 -- they represent a significant effect on the Johnsongrass stand and growth. Evaluations were primarily made on the stand and growth. Johnsongrass roots were severely stunted and rhizome production was apparently reduced (table 5).

While layered dichlobenil (Casoron®) gave somewhat better Johnsongrass control, it did not have the same degree of safety that trifluralin (Treflan ®) did on old vines in the field (tables 1 to 4) and young cuttings in the greenhouse (table 6).

® Registered trade name

Since Johnsongrass storage organs are relatively shallow -- generally 3 to 10 inches deep -- results of these trials suggest it is feasible to dislodge Johnsongrass rhizomes by fall French plowing immediately after harvest and pruning. This procedure itself reduces Johnsongrass rhizome viability. Later, in early spring before warm temperatures, Johnsongrass regrowth can be partially controlled by spraying a layer of herbicide like trifluralin, dichlobenil, or perhaps some other herbicide still in the experimental stage of development.

Results of this study indicate that complete control will not be attained in 1 year. The observed effects of subsurface application suggest that repeated dalapon or other postemergence application during the summer, followed by subsurface retreatment the following winter with trifluralin, can greatly reduce Johnsongrass stand and vigor.

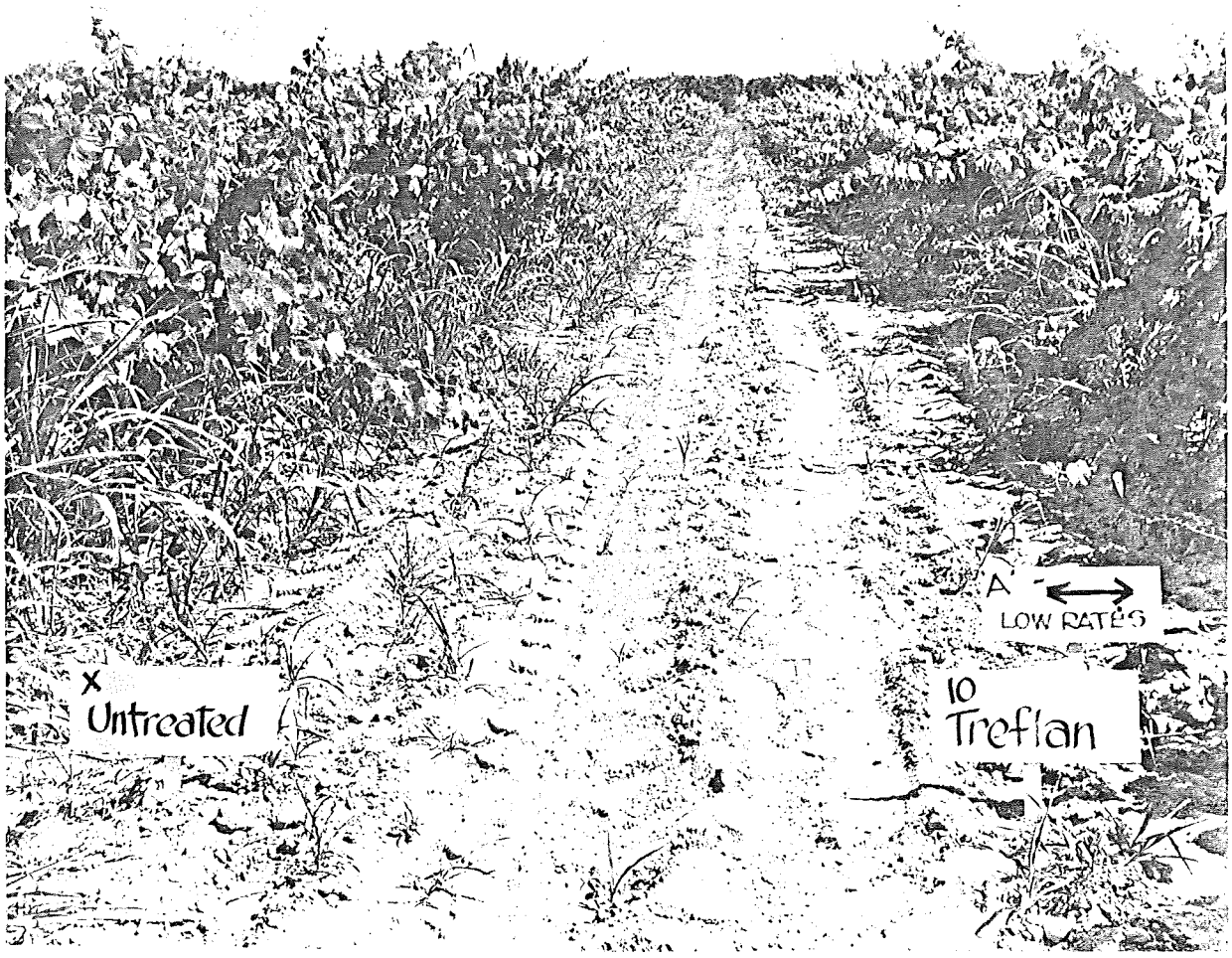

Figure 1. An untreated plot on the left compared with a plot treated with trifluralin at the rate of 2 lb./A applied by subsurface blade at 4 to 6 inches.

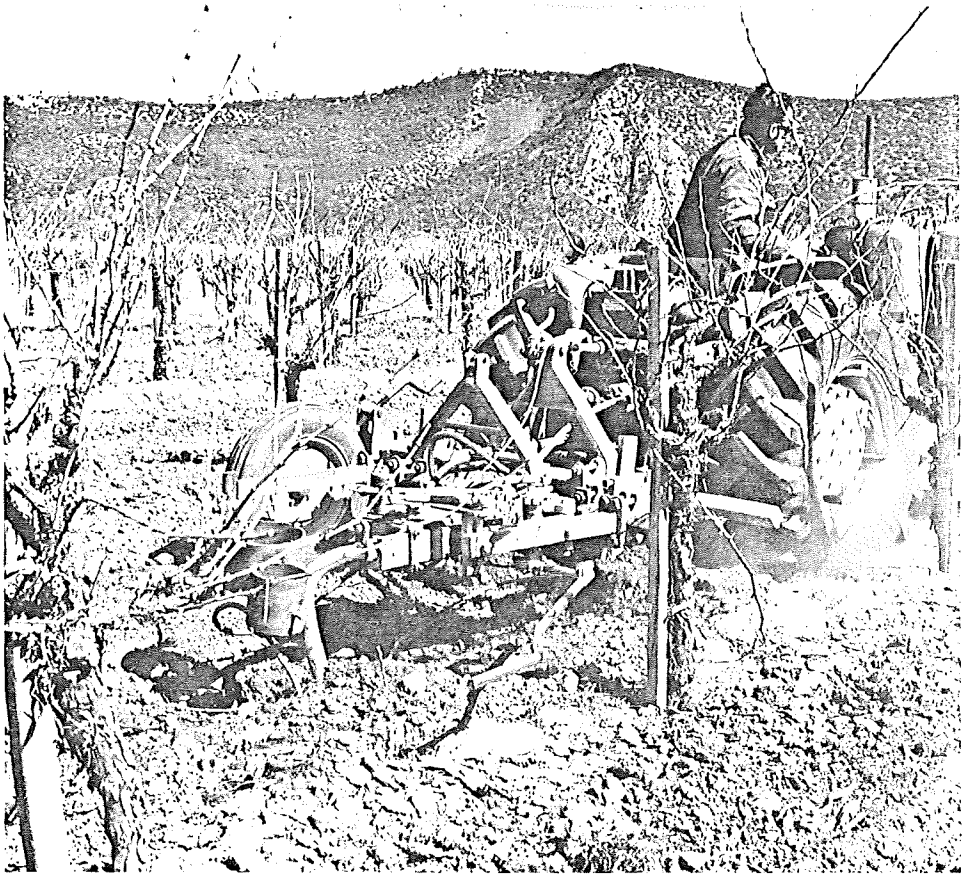

Figure 2. The spray blade used in this study.

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in their original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, irresponsible persons, pets, and livestock.

Confine chemicals to the area being treated. Avoid drift onto neighboring properties, especially those containing food or forage crops.

Consult your County Agricultural Commissioner for correct methods of disposing of leftover spray material and empty containers. Never burn pesticide containers.

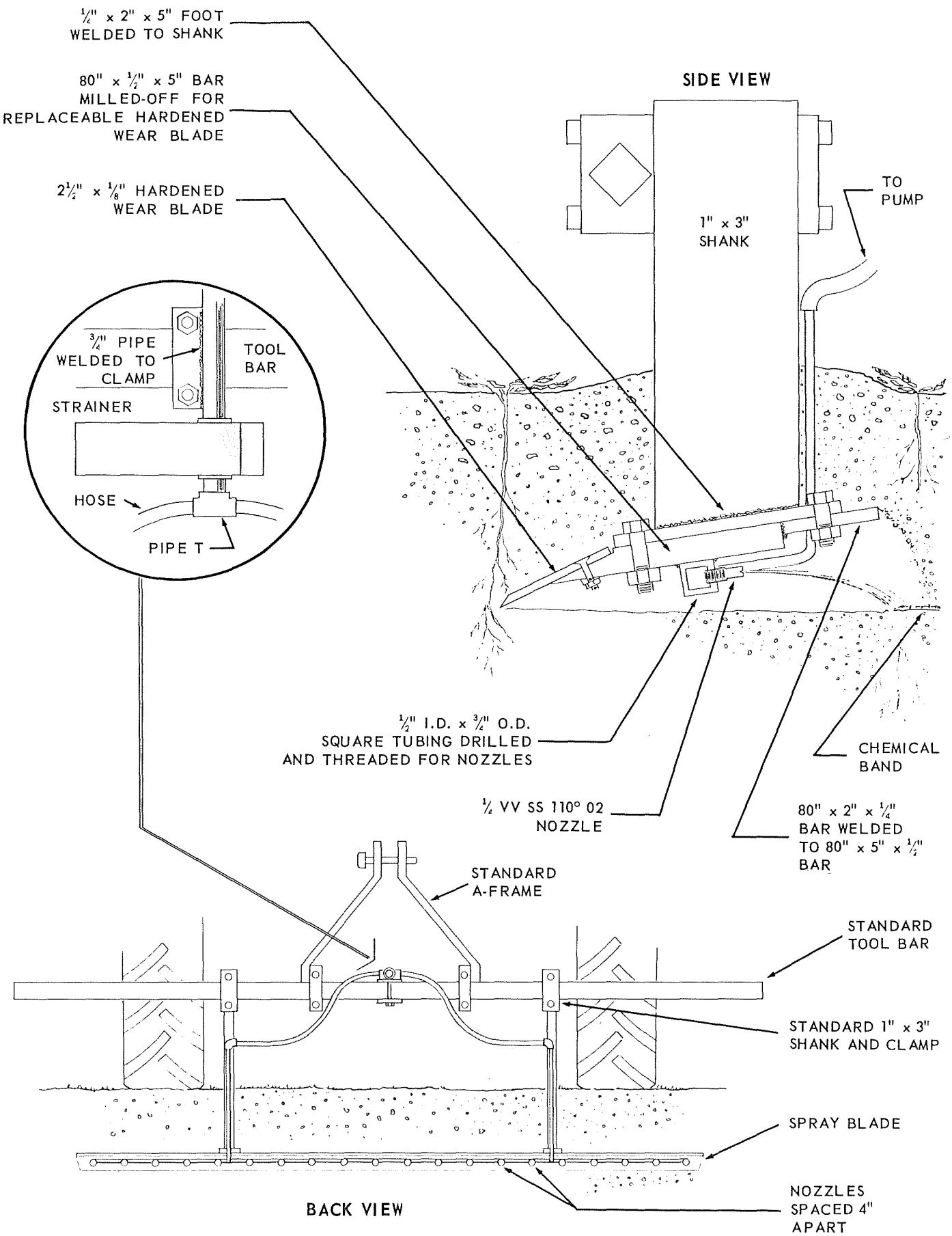

Figure 3. A generalized drawing of a spray blade.

Table 1. Johnsongrass Control With Subsurface Herbicides Applied by French Plow, Followed by Discing. (Soil analysis: 0.15% organic matter; 6% clay; 25% silt; 69% sand.)

Treatment	lb./A	Date Applied	Weed Control[1] -- Days After Application			Phyto-toxicity[2] at 111 Days (6/5/71)	Average Weed Control[1]
			51 (4/7/71)	89 (5/14/71)	111 (6/5/71)		
trifluralin	2	2/14/71	4.3	4.8	4.0	0	4.4
trifluralin	8	2/14/71	6.3	6.0	4.0	0	5.4
R7465	2	2/14/71	0.3	0.3	0.7	0	0.6
R7465	8	2/14/71	5.0	4.3	3.7	0	4.3
EL 119	2	2/14/71	5.3	4.3	3.7	0	4.4
EL 119	8	2/14/71	5.0	3.0	3.7	0	3.9
dichlobenil	2	2/14/71	7.0	6.7	6.7	2.0	6.8
dichlobenil	8	2/14/71	6.0	5.0	5.0	3.5	4.7
Check	-	--	2.3	0.3	0	0	0.9

See footnotes at end of tables.

Table 4. Johnsongrass Control by French Plow and Disc. (Soil analysis: 0.6% organic matter; 6% clay; 28% silt; 64% sand.)

Treatment	lb./A	Date Applied	Weed Control[1] -- Days After Application		Phyto-toxicity[2] at 63 Days (7/7/71)	Average Weed Control[1]
			31 (6/5/71)	63 (7/7/71)		
trifluralin	4	5/5/71	5.0	6.0	0	5.5
trifluralin	16	5/5/71	5.7	6.0	0	5.8
SAN 9789	4	5/5/71	2.3	5.3	0	3.8
SAN 9789	16	5/5/71	6.0	7.7	0	6.8
pronamide	4	5/5/71	3.0	5.3	0	4.2
pronamide	16	5/5/71	4.7	5.0	0	4.8
dichlobenil	4	5/5/71	5.7	6.3	1.0	6.0
dichlobenil	16	5/5/71	8.0	9.0	4.0	8.5
RP17623	4	5/5/71	0.7	2.7	0	1.7
RP17623	16	5/5/71	3.0	5.7	0	4.4
MON 097	4	5/5/71	5.0	5.7	0	5.4
MON 097	16	5/5/71	4.7	5.7	0	5.2
IMC 3950	4	5/5/71	2.0	4.0	0	3.0
IMC 3950	16	5/5/71	3.3	2.2	0	2.8
GS 38946	4	5/5/71	0.3	4.0	0	2.2
GS 38946	16	5/5/71	1.7	5.0	0	3.4
EPTC	16	5/5/71	7.3	4.0	0	5.6
Check	--	--	2.3	3.8	0	2.6

See footnotes at end of tables.