

Weed Control in Potato with 200 Grain Vinegar applied Postemergence
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Organic growers have few or no herbicides available for weed control. Normal vinegar contains 5% acetic acid and when applied postemergence to small weed seedlings injures and sometimes kills them. Elevated acetic acid levels have increased weed control in several previous studies.

Four treatments of 200 grain vinegar (20% acetic acid) were applied postemergence to potato and weeds and evaluated for weed and crop response at Paterson, WA in 2004. Vinegar (20% acetic acid) was tested at two rates; 20 GPA and 40 GPA, with and without an organically approved yucca extract at 2.5% (v/v) spray solution. A nontreated check was included for comparison. Site and soil conditions and potato planting were identical to the studies reported above. Umatilla potatoes were planted with a six-row planter on March 26, 2004. Herbicides were applied with a five-nozzle boom attached to a CO₂ pressurized bike sprayer calibrated to deliver 20 GPA. The 40 GPA treatments were obtained by decreasing the sprayer speed in half. Potatoes were 4 to 8 inches tall at the time of herbicide application on May 14, 2004. Each of the four treatments were only replicated twice due to a limited amount of vinegar. Weeds were cotyledon to 2-leaf stage of growth with most about 0.5 inches tall. Potato injury, weed control, final weed counts at harvest, and potato yield were recorded.

Nightshade (a mix of 75% hairy nightshade and 25% black nightshade), pigweed (a mix of *Amaranthus retroflexis* and *A. powellii*), common lambsquarters, Russian thistle, and large crabgrass were the main species present in the trial.

Vinegar (200 grain) applied at 20 and 40 GPA injured potatoes from 45 to 65%, respectively, at one day after application. Potatoes regrew quickly and by one week after application, injury ranged from 10 to 21%. Potato injury at 1 WAT was lessened by the addition of yucca extract, but weed control was reduced as well. By 47 DAT, no potato injury was evident from vinegar applications compared to nontreated checks.

Nightshade was controlled from 90 to 97%, pigweed from 90 to 99%, lambsquarters from 83 to 99%, and crabgrass from 65 to 88% at 1 WAT. Weeds continued to emerge prior to potato row closure. Total weed control in late June ranged from 42 to 85% control compared to the nontreated check.

Potato yield was not significantly different among treatments and was similar to weedy checks, which averaged 21 ton/acre. Hand-weeded check plots from a neighboring potato trial yielded 29.1 ton/acre. Although vinegar killed small broadleaf weeds, new weed flushes occurred prior to potato row closure and likely reduced potato yield. Vinegar (200 grain) could be a useful tool to organic growers.

**Vinegar 200 Grain on Postemergence Weed Control in
Potato**

Location: Paterson			Investigator: Rick Boydston					
Weed Code			Potato	Potato	Potato	Potato	Nightshade	Pigweed
Crop Code			Injury	Injury	Injury	Yield	Control	Control
Rating Data Type			Percent	Percent	Percent	T/a	Percent	Percent
Rating Unit			May-14-04	May-20-04	Jun-29-04	Sep-13-04	May-20-04	May-20-04
Rating Date			1 DA-A	7 DA-A	47 DA-A	123 DA-A	7 DA-A	7 DA-A
Trt-Eval Interval								
Trt No.	Treatment Name	Rate Unit						
1	Vinegar 200 grain	80 QT/A	45.00 b	17.50 ab	0.00 a	20.90 a	96.50 a	99.00 a
2	Vinegar 200 grain Yucca Extract	80 QT/A 2.5 % V/V	45.00 b	10.00 c	0.00 a	21.95 a	90.00 b	90.00 c
3	Vinegar 200 grain	160 QT/A	65.00 a	21.50 a	0.00 a	20.20 a	96.50 a	99.50 a
4	Vinegar 200 grain Yucca Extract	160 QT/A 2.5 % V/V	65.00 a	15.00 b	0.00 a	25.30 a	90.00 b	95.00 b
5	Nontreated Check		0.00 c	0.00 d	0.00 a	21.00 a	0.00 c	0.00 d
LSD (P=.05)			8.778	4.519	0.000	9.822	4.164	0.878
Treatment F			141.000	51.755	0.000	0.649	1555.267	37059.000
Treatment Prob(F)			0.0001	0.0011	1.0000	0.6571	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

Weed Code			LambsQ	Crab Grass	All Weed
Crop Code			Control	Control	Control
Rating Data Type			Percent	Percent	Percent
Rating Unit			May-20-04	May-20-04	Jun-29-04
Rating Date			7 DA-A	7 DA-A	47 DA-A
Trt-Eval Interval					
Trt No.	Treatment Name	Rate Unit			
1	Vinegar 200 grain	80 QT/A	92.50 ab	85.00 ab	82.50 a
2	Vinegar 200 grain Yucca Extract	80 QT/A 2.5 % V/V	82.50 c	65.00 c	42.50 b
3	Vinegar 200 grain	160 QT/A	99.50 a	87.50 a	85.00 a
4	Vinegar 200 grain Yucca Extract	160 QT/A 2.5 % V/V	87.50 bc	72.50 bc	82.50 a
5	Nontreated Check		0.00 d	0.00 d	0.00 c
LSD (P=.05)			8.141	12.797	18.879
Treatment F			390.128	121.000	59.811
Treatment Prob(F)			0.0001	0.0002	0.0008

Means followed by same letter do not significantly differ (P=.05, LSD)