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Authors	Tickes, Barry
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# Evaluation of Kerb Applied by Sprinkler Irrigation to Lettuce

Barry Tickes

## Abstract

*Three tests were conducted to compare delayed applications of Kerb applied by air with those applied through the sprinklers. Early (6-5-02) season and mid (10-20-02) applications made through the sprinklers were significantly more effective than those applied by air. The late season (11-17-02) application was made too early and the weed control was poor demonstrating the need for proper timing regardless of the application technique. It was concluded that chemigation can be an effective technique for making delayed applications of Kerb to lettuce in the low deserts.*

## Introduction

Previous studies have demonstrated that when Kerb is applied after planting and before starting sprinkler irrigation, that the herbicide is often leached below weed seeds prior to the germination. These studies have been conducted in the low desert of Arizona where it is common to apply 10 to 15 inches of water during germination ("Timing Kerb Applications in Lettuce," 2001 Vegetable Report, College of Agriculture, University of Arizona, pgs. 123-127). When leaching occurs, poor weed control results except for the most sensitive weed species. This problem has been overcome by either careful water management or by delaying Kerb applications until just before weed seed germination. Timing delayed applications is difficult and requires careful attention to season, weed species, environmental conditions, soil type, water applications and other factors. Delayed Kerb applications to wet fields must be made by air. Aerial applications cannot be as precise as band applications made with accurately calibrated ground sprayers. In practice, overlaps and skips have sometimes occurred and caused crop injury, poor weed control or both. The only other option for applying Kerb to wet fields is by chemigation through the sprinklers. Sprinklers are primarily designed to apply water and are not designed to maintain the precise pressure or contain the precision orifices that are characteristic of ground sprayers. It is not uncommon, however, to apply insecticides and herbicides through sprinkler systems and many are labeled for this type of application. Kerb is not currently labeled for application through sprinklers to lettuce. This project was conducted to compare the weed control and crop safety of Kerb applied by air with Kerb applied through sprinklers to lettuce.

## Procedures

This project was not intended to be conducted on a small scale under controlled conditions. It was intended to evaluate an application technique under normal commercial conditions. Three tests were conducted to correspond to an early season (6-5); mid-season (10-20) and late season application timings. The early season timing was far earlier than normal although a good opportunity was present to evaluate Kerb chemigation during the normal hot conditions that are present in Aug-Sept. Delayed applications were scheduled according to the optimal times identified in previous studies. A description of each of the three tests follows:

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**Test 1**

Location: Amigo Farms, South Yuma Valley  
 Date Applied: 6-5-02  
 Rate(s): (lbs/AC): 1.0, 1.5, 2.0  
 Application Delayed: 24 hours  
 Plot Size: 5 to 50 AC (see map)  
 Evaluated: 6-25-02, 30 DAT  
 Weeds: Common Purslane (*Portulaca oleracea*) Wright groundcherry (*Physalis wrightii*)

**Test 2**

Location: Curry Farms, North Yuma Valley  
 Date Applied: 10-20-02  
 Rate(s): (lbs/AC): 1.3 lb.  
 Application Delayed: 3 days  
 Plot Size: 17 AC  
 Evaluated: 11-19-02, 30 DAT  
 Weeds: Sheperdspurse (*Capsella bursa*)

**Test 3**

Location: University of Arizona, Yuma Valley Agricultural Center, North Yuma Valley  
 Date Applied: 11-17-02  
 Rate(s): (lbs/AC): 1.5 lb./AC  
 Application Delayed: 4 days  
 Plot Size: 0.5 AC  
 Evaluated: 12-05-02, 33 DAT  
 Weeds: India mustard (var. Florida broadleaf) planted as an indicator

**Results**

Table 1. Amigo Farms, Test 1, Chemigation vs. Aerial application of Kerb to Fallow Ground

<b>Rate (lb/AC)</b>	<b>Application</b>	<b>Weeds (per 0.0001 A)</b>	
		<b>Purlane</b>	<b>Ground cherry</b>
1.0	Chemigation	0.8 <sup>1</sup>	0.2
Untreated	--	4.7 <sup>2</sup>	1.0
1.5	Chemigation	0.6	1.4
Untreated	--	0.8	4.4
2.0	Chemigation	1.2	1.0
Untreated	--	0.5	4.4
1.5	Aerial	1.7	12.4
Untreated	--	3.8	19.5

<sup>1</sup>Average of 10 subplot counts<sup>2</sup>Average of 9 subplot counts in 3 untreated checks

untreated checks = 14' x 10'  
 plots - 5 to 50 acres (see map)

Table 2. Curry Farms, Test 2, Chemigation vs. Aerial Application of Kerb Applied to Head Lettuce

<u>Rate (lb/AC)</u>	<u>Application</u>	<u>Weeds (per 660 ft. row)</u>
1.3	Aerial	95.5 <sup>1</sup>
1.3	Chemigation (Sprinklers)	30.0 <sup>1</sup>

<sup>1</sup>Average of 4 replications

Table 3. Yuma Valley Ag Center, Chemigation of Kerb Applied to Head Lettuce vs. Untreated Check

<u>Rate (lb/AC)</u>	<u>Application</u>	<u>Weeds (per 660 ft. row)</u>
1.5	Chemigation (Sprinklers)	240.7 <sup>1</sup>
Untreated	--	332.2 <sup>1</sup>

<sup>1</sup>Average of 4 replications

## Discussion

A common perception is that sprinklers lack the precision to apply pesticides because of the variability in orifices, the inability to maintain precise pressure and the variation caused by environmental conditions such as wind, over the time required to apply the product. Several insecticides, fungicides and herbicides are registered for this type of application, however, with few problems reported.

Precisely calibrated ground sprayers are the most accurate means of apply herbicides. It is not possible to make delayed applications of Kerb to wet fields with ground equipment in most cases. These tests were conducted to evaluate aerial and chemigation applications. In tests 1 and 2, the chemigated applications were significantly more effective than the aerial applications. In test 3, poor weed control was achieved because the sprinklers were run for five days after the Kerb was applied and before the lettuce and weeds emerged. This resulted in leaching of the herbicide and poor weed control. This demonstrates the importance of proper timing, regardless of the application technique. Crop injury was not apparent in any of these tests.

It can be concluded from these tests that chemigation can be an effective technique for making delayed applications of Kerb to lettuce in the low deserts.

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