

POST-EMERGENCE HERBICIDES FOR ONIONS

R.W. Stark
Department of Agriculture, Victoria

The use of herbicides for post-emergence weed control in onions is not a new innovation in Victoria, a limited quantity of such inorganic herbicides as potassium cyanate and sulphuric acid having been used since the 1940s. More recently such herbicides as linuron, prometryne, ioxynil, aziprotryne and nitrofen, after limited field trials, have been tried on commercial onion crops and some damage and other problems have resulted.

It is well known that the tolerance of the onion to these herbicides increases rapidly as the onion gains size and the number of leaves increases. The table shows numbers of harvested onions as a percentage of those present before treatment in a trial conducted at the Vegetable Research Station, Frankston, during the 1969-70 season.

Survival of Onions After Application
Of Post-emergence Weedicide

Treatment	Rate per acre	Stage of growth when weedicide applied				
		One Leaf	Two Leaves	Three Leaves	Four Leaves	Five Leaves
	lb. a. i.	%	%	%	%	%
Linuron	1.0	13.2	85.2	98.9	99.0	100.0
Prometryne	1.0	32.0	99.4	98.3	98.7	100.0
Ioxynil	0.625	15.5	98.9	100.0	98.7	99.0
Aziprotryne	2.25	66.8	100.0	99.0	99.6	99.6
Nitrofen	3.0	77.6	99.2	98.8	98.0	100.0
Cultivated	-	90.3	98.2	99.0	99.4	99.6

Fortunately the onion quickly develops an extensive root system and once the plant develops two to three leaves it is difficult

to kill. Severe herbicide damage at this early stage has not significantly reduced final yields in several trials.

Onions grown in southern Victoria initially grow very slowly. Seed which is usually sown in May, June and July takes from 3-4 weeks to emerge and from 10-12 weeks to develop three true leaves. The fourth leaf is extended about two weeks later. Assuming that about the three leaf stage is the minimum size that an onion will tolerate the existing post-emergence herbicides, it is apparent that unless mechanical or pre-emergence weed control has been used, many weed species will be too large to control satisfactorily. Because of these limitations, varying amounts of crop damage and some poor weed control has been observed on treated commercial crops.

The kind of damage observed was tipburn and wilting with prometryne and aziprotryne; chlorosis, tipburn and wilting with ioxynil and linuron; and leaf distortion with some wilting when nitrofen was used.

Severe damage has been seen where 'Vivid Leaf' odourless onions were treated at from three to about ten leaves with prometryne, ioxynil and aziprotryne. Similar damage was observed on a neighbouring property where onions of the early brown globe type were treated with prometryne and ioxynil. In both cases the growers indicated that the most advanced onions were slowest to recover, and that maturity was delayed and quality reduced.

Experience has shown that small margin for error exists when using these post emergence herbicides. A promising alternative to the use of a post emergence herbicide is the double application of a pre-emergence herbicide. While this method necessitates cultivation before treatment and is thus more expensive, it virtually eliminates the possibility of crop damage. A second application of such herbicides as chlorthal, propachlor and chlorpropham has given outstanding weed control and yields in trials conducted by the Victorian Department of Agriculture.