Research Note

CONTROL OF TUTSAN

G. A. JOHNS

Ivon Watkins-Dow Ltd., New Plymouth

Summary

Results of trials on the control of tutsan (*Hypericum androsaemum*) with combinations of picloram and 2,4-D or 2,4,5-T as high volume and low volume misting applications are presented and discussed. Results with picloram granules are also presented. Picloram has proved far superior to the standard overall spray of 2,4,5-T ester which gives only limited resprout control. Mixtures of 2,4,5-T with picloram show greater activity than 2,4-D combinations. Picloram/2,4,5-T at 0.375/1.0 lb per 100 gal for high volume applications and a ten times concentration for mist-blower applications have given satisfactory control. Granules of picloram down to 0.3 gram of active ingredient per square yard of basal plant area have given satisfactory control. Treatments in the October to December period appear preferable.

INTRODUCTION

TUTSAN (*Hypericum androsaemum*) is a semi-woody perennial weed which occurs in scattered infestations throughout New Zealand. Tutsan apparently was not noticed in New Zealand until as recently as 1920 when only a few small areas were infested. Only in the Taumarunui County where it is estimated to cover 5,000 acres of land is tutsan considered a serious problem weed. In most locations it is confined to sheep farms where it may develop into dense stands 5 to 6 ft high which are impenetrable to stock. Tutsan is not only a competitive ground cover weed but in its characteristic dense stands it makes stock movement difficult. The fleshy ripe fruit stains the wool, and like other members of its genus tutsan may cause photosensitivity in stock.

Tutsan seedlings develop on both cultivated ground and pasture, and if left unchecked they spread rapidly. Tutsan will survive and be competitive under conditions of both high and low soil fertility. Apart from the young seedling stage, tutsan is unpalatable to stock.

METHODS OF CONTROL

FARM MANAGEMENT

Until recent years, the only method of control has been farm management. Stock have been observed grazing very young seedlings, but even under heavy mob stocking, seedlings only 2 to 4 in. high have proved extremely unpalatable. Oversowing and fertilizing plus stock will not eradicate mature stands of tutsan. However, the maintenance of a high producing dense pasture sward will prevent rapid re-establishment. Cultivation followed by good pasture management gives satisfactory control but is not of great practical significance as the majority of the serious infestations are on steep and unploughable hill country.

BIOLOGICAL CONTROL

In 1950, a limited number of St. John's wort beetles (*Chrysolina hyperici*) were liberated in selected areas in the King Country. These beetles were carriers of a rust (*Melampsora hypericorum*) which completely defoliates the plant. Successful control was obtained in these limited release areas, but no noticeable spread of the rust was apparent. Recent observations by local field officers of the Department of Agriculture indicate that beetles have survived, although there are only occasional cases where isolated plants have been defoliated (S. Picken, pers. comm.).

CHEMICAL CONTROL

2,4,5-T as esters at rates up to 8 lb per acre has given satisfactory brown-off and stem kill but very few, if any, complete kills have been obtained. (All rates are expressed as lb active ingredient per 100 gal for spray treatments and per acre for granule treatments.) Typical regrowth shoots appear from the base of the plants by the end of the season of treatment and regrowth is practically complete by the following season.

In 1963, trials were commenced in the Taumarunui district evaluating various formulations of picloram in comparison with 2,4,5-T. A summary of the results obtained are presented in this paper.

EXPERIMENTAL

High volume treatments were applied using a standard brush gun at 200 to 250 lb/sq. in., the bushes being sprayed to complete coverage of both foliage and stems; 10 to 15 gal of spray mixture were applied per plot. Low volume treatments were applied with a motorized mist-blower giving a light overall coverage of foliage and stems. The granule treatments were applied by hand over an area extending from the drip line inwards to the base of individual plants. A granule formulation containing 2% w/w picloram coated on a calcite core was used in the trials.

Ratings are based on a 0 to 10 visual scale (10 = maximum effect; 0 = nil effect). The values quoted are the means of the visual ratings of two or more independent observers.

RESULTS AND DISCUSSION

HIGH VOLUME APPLICATIONS

Treatments were applied in January when the foliage was just commencing to change colour and some ripe fruit were present. Ratings for brown-off and regrowth suppression are presented in Table 1.

These results confirm the farmer experience with 2,4,5-T where a complete initial top kill and defoliation is obtained but strong regrowth appears by the following season. Picloram/2,4,5-T mixtures gave much superior control of 2,4,5-T ester and the equivalent mixture of picloram and 2,4-D.

TABLE 1: CONTROL OF TUTSAN—HIGH VOLUME APPLICATION

<i>Treatment</i> (lb/100 gal)	<i>Control</i>		
	<i>Brown-off</i> 14*	<i>Regrowth</i> 44*	<i>Suppression</i> 64*
2,4,5-T (BE ester) 1.8	 10	4.0	3.7
Picloram 0.25/2,4,5-T 1.0	 10	3.5	4.0
Picloram 0.25/2,4,5-T 1.0	 10	9.0	9.0
Picloram 0.25/2,4,5-T 0.67	10	8.0	8.0
Picloram 0.375/2,4,5-T 1.0	 10	7.0	7.0
Control	 0	0	0

*Weeks following application.

GRANULE APPLICATIONS

Applications were made in November, 1965, to actively growing bushes which were up to 4 ft high and in full flower. Results are presented in Table 2.

TABLE 2: CONTROL OF TUTSAN WITH PICLORAM GRANULES

<i>Treatment</i> (lb/acre)	<i>Control</i>		
	<i>Brown-off</i> 10*	<i>Regrowth</i> 24*	<i>Suppression</i> 78*
Picloram 1.5	 6	7.0	5.7
Picloram 3.0	 10	10	10
Picloram 6.0	 10	10	10
Picloram 12.0	 10	10	10
Control	 0	0	0

*Weeks following application.

Rates of picloram at 3 lb and above gave excellent control with a comparatively rapid brown-off. After 18 months, considerable stem disintegration had occurred with no resprouts evident.

MISTBLOWER APPLICATIONS

Treatments were made in January, 1965, to bushes 2 to 5 ft high with new growth complete. Some ripe berries were present and the leaves had commenced to change colour. Results are presented in Table 3.

TABLE 3: CONTROL OF TUTSAN—MISTBLOWER APPLICATION

<i>Treatment</i> (lb/100 gal.)	<i>Regrowth Suppression</i>		
	18*	40*	52*
Picloram 1.25/2,4,5-T 5.0	 6.5	2.0	5.0
Picloram 2.5/2,4-D 10.0	 8.2	4.0	5.5
Picloram 1.25/2,4-D 5.0	 8.2	4.0	6.0
Picloram 1.875/2,4,5-T 5.0	 8.7	3.0	7.5
Picloram 3.75/2,4,5-T 10.0	 9.5	7.0	8.2
Control	 0	0	0

*Weeks following application.

In this trial picloram/2,4-D was inferior in root kill to the picloram/2,4,5-T mixture. No treatment gave a complete kill. This was probably due to the dense foliage present at the time of treatment, making it difficult for spray to penetrate to all the stems of the plant. The preferred time of treatment by this method may be in the October/early November period of leaf bud burst before the full foliage cover has developed.

DISCUSSION

From the present field trials it would appear that a full spray coverage of stems and foliage is necessary for complete root kill of tutsan with picloram/2,4,5-T mixtures.

For spray treatments, tutsan should be treated in the mid-October/November period and possibly up to, but no later than mid-January.

The most practical criterion for assessing the quantity of granules to apply when treating individual plants is the basal area within the drip line. Granule applications are most suitable for treating scattered plants or in areas where access with conventional spray gear is difficult.

CONCLUSIONS

Picloram is the most active chemical yet evaluated for the control of tutsan, being much more effective than 2,4,5-T in root kill ability. Excellent results for both stem and root kill have been obtained with minimum rates of picloram in mixture with 2,4,5-T. For high volume applications, picloram and 2,4,5-T are effective at a rate of 0.375/lb per 100 gal of water applied from early to full leaf stage of growth. Mist-blower treatment at ten times concentration applied prior to full leaf offers an alternative method of control. Granules appear to be the desirable treatment applied at a rate of between 0.3 and 0.6 lb picloram per square yard of ground cover depending on the maturity of the plant. Owing to the steep and inaccessible nature of the hill country infested with tutsan, future investigations should include the aerial application of picloram/2,4,5-T combinations.

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