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Imazameth is safe on grass, leafy spurge is becoming resistant to picloram and other myths?

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Imazameth (AC 263,222) has been shown to provide good leafy spurge control with acceptable grass tolerance for warm-season species in Nebraska. However, cool-season grass injury was severe when imazameth was evaluated in North Dakota. Leafy spurge control in June 1996 increased as application rate increased and averaged 80 to 100% when imazameth was applied from 0.125 to 0.5 lb/A, respectively, on September 18, 1995. Unfortunately, grass injury to cool-season species ranged from 10 to 65%. Imazameth is currently being evaluated at lower rates, alone and with additives, and as a spring applied treatment in an effort to obtain good leafy spurge control with minimal grass injury in North Dakota.

Glyphosate plus 2,4-D plus 0.6 lb/A will provide 70 to 90% leafy spurge control after one treatment but can cause severe grass injury with repeated applications. A series of experiments was established at three locations to compare cost and efficacy of glyphosate plus 2,4-D as part of a long-term management program for leafy spurge control. The initial treatments of glyphosate plus 2,4-D or picloram plus 2,4-D were applied in late June of 1993 and were retreated with the same or an alternate treatment in 1994 and 1995. Visual evaluation were taken annually from 1993 to 1996. Glyphosate plus 2,4-D provided 75% leafy spurge control 12 months after treatment (MAT) compared to 30% for picloram plus 2,4-D. All treatments provided similar control when annually applied for 3 years but the total treatment cost was variable. Glyphosate plus 2,4-D applied three consecutive years provided 73% control with only 10% grass injury and cost \$27/A. Glyphosate plus 2,4-D applied in 1993 and 1995 with picloram plus 2,4-D applied in 1994 averaged 80% control and cost \$31/A. Three annual applications of picloram plus 2,4-D provided 70% control and cost \$40/A. There was no significant grass injury for any treatment.

Picloram is one of the most effective herbicides for leafy spurge control. Previous research at North Dakota State University has shown that picloram plus 2,4-D at 0.25 plus 1 lb/A will provide approximately 85% control or better after 3 to 5 years of annual treatment. Picloram alone at 1 to 2 lb/A will provide acceptable leafy spurge control for

18 to 24 months in North Dakota. Recently at field tours and educational meetings land managers have expressed concern that picloram provides less leafy spurge control than they have come to expect. To determine if leafy spurge was becoming resistant or tolerant to picloram, the average leafy spurge control with picloram and picloram plus 2,4-D treatments applied from 1963 to 1982 (historical) was compared to the same treatments applied from 1983 to 1985 (present). The average control was less with present day treatments for every picloram treatment regardless of application rate, if applied alone or with 2,4-D, or in the spring or fall. For example, picloram at 0.5 lb/A alone historically averaged 85% control 12 months after treatment compared to an average of 55% control with the present day treatments. Also, picloram at 1 lb/A provided 88 and 68% control when the historical average was compared to the present treatment average, respectively.

The reason for the better control observed with the historical compared to present treatments may be due to the plant becoming resistant to picloram, or the more susceptible plants have been controlled and only the most vigorous plants remain, or the personnel conducting the evaluation have become more demanding. To determine if control indeed was decreasing with time, the average control from 1984 to 1988 was compared to the average control of the same treatments applied from 1991 to 1995. The same personnel conducted the evaluations in both time periods. The average control was similar to slightly better from 1991 to 1995 compared to treatments applied from 1984 to 1988. If leafy spurge control with picloram was declining with time, the control observed from 1984 to 1988 should have been better than that from 1991 to 1995. Thus, it is not likely leafy spurge has become resistant to picloram, or that only the most vigorous or tolerant plants remain. It is likely the expectations of control with picloram have increased and historical evaluators tended to rate control higher than present.