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Selective use of glyphosate and sulfosate in perennial grass species for leafy spurge control

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Experiments conducted by Whitson in 1988 and 1989 have shown that glyphosate can be used as split applications to selectively control leafy spurge without totally controlling perennial grasses found in the understory. Two studies were conducted in 1989 and 1990 to determine tolerances perennial grasses have for glyphosate. The first study was conducted with 5 grass species which were transplanted from a field study to the U.W. greenhouse. The second study was conducted in the field with ten grass species established in 1986 at the Powell Research and Extension Center. Glyphosate, sulfosate and glyphosate plus 2,4-D were compared in the field study.

Grass species in the greenhouse study included: Western wheatgrass (Rosana), pubescent wheatgrass (Luna), crested wheatgrass (Ephraim), big bluegrass (Sherman), and Russian wildrye (Bozoisky). Grass species in the field study included: Russian wildrye (Russian), western wheatgrass (Rosana), thickspike wheatgrass (Critana), streambank wheatgrass (Sodar), slender wheatgrass (Prior), mountain brome grass (Bromar), Russian wildrye (Synthetic A), basin wildrye (Magnar), meadow brome grass (Regar) and crested wheatgrass (Hycrest).

The results of both studies show that differences do exist among perennial grass species for tolerances to glyphosate. In the greenhouse study glyphosate rates of 0.25, 0.5, 0.75 and 1.0 lb ae/A were applied after grasses were established and growth rates for each transplant were determined. Pubescent wheatgrass showed tolerance up to 1.0 lb ae/A, western wheatgrass up to 0.75 lb ae/A, Russian wildrye up to 0.5 lb ae/A, while crested wheatgrass and big bluegrass exhibited tolerance for levels up to 0.25 lb ae/A.

Field studies revealed that grass species are less sensitive to glyphosate and sulfosate when applied in early vegetative stages (April 11) than at the early bolt stage (May 31). The wildrye species had considerable seedhead suppression as a result of the vegetative stage application because of the early seed head initiation found within those species. Tolerance was found for all grass species for application of both glyphosate and sulfosate for rates up to 0.62 lb ae/A, at the early vegetative application. Grasses were more tolerant to sulfosate than glyphosate when applied at the same rates. Evaluations made 3 weeks after the May 31, 1990 applications of glyphosate and sulfosate indicate that tolerance levels are below 0.38 lb ae/A when applied at the early bolt stage. Therefore, when glyphosate or sulfosate are applied as selective treatments for leafy spurge control an application of up to 0.62 lb ae/A can be applied early in the season followed by successive glyphosate or sulfosate applications up to the .38 lb ae/A level.