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Sponsored by: Montana Agricultural Experiment Station, Montana State University, Bozeman, MT.

Picloram translocation to leafy spurge roots over the growing season[1]

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Picloram applied at 1 to 2 lb ae/A generally provides 70 to 90% 1eafy spurge control for 18 to 36 months. However, control from picloram can be inconsistent and occasionally has given only 5% or less control 2 months after application even when properly applied at 2 lb/A. The purpose of this research was to evaluate picloram absorption and translocation in leafy spurge over the growing season.

^{14}C-picloram was applied to leafy spurge plants in a series of greenhouse and field experiments. The data from 204 plants in 11 experimental trials were combined to produce an overview of the absorption and distribution of picloram in leafy spurge following foliar application. The amount of picloram found in various plant sections was averaged and was converted from percent of applied ^{14}C-picloram found in each plant section to dollars per acre ($/A) based on a $20/A treatment.

For the field study, roots of leafy spurge accession 1984 ND 001 were divided and planted into pots in July of 1983 or 1984. The pots were buried in the soil to a depth of 7 inches and allowed to grow until the following growing season. ^{14}C-picloram was applied weekly from mid-May until mid-October in 1984 or 1985 and the plants were harvested 72 hours after treatment. ^{14}C-picloram translocation to the roots (12 inches deep) was determined and is presented as dpm/gm.

Only $7.40 of chemical from a $20/A treatment is absorbed into leafy spurge (Figure 1). Of this, $6 remains in the stems and leaves and only $1.40 is translocated to the roots. Approximately 60% of the picloram reaching the roots leaks into the soil leaving only $0.60 of the original $20/A treatment to control leafy spurge roots.

Long-term leafy spurge control with picloram is best when applied when the true flower and seeds are developing or in early to mid-September after the stems have developed fall regrowth (Figure 2). Maximum ^{14}C-picloram translocation to the roots occurred during the flowering and seed-set growth stages with nearly five times as much picloram reaching the roots at this time compared to any other growth stage (Figure 3). It is impor-

[1] Summary of a poster presented during the field tour portion of the meeting.

tant to apply picloram during this growth stage to maximize the cost-effectiveness of the treatment. The increased control obtained from fall-applied compared to spring- or mid-summer-applied treatments must be due to factors other than ^{14}C-picloram translocation to the roots since there was no increase in translocation to the roots in the fall. Perhaps fall-applied treatments disrupt carbohydrate translocation to the roots and thus decrease water hardiness.

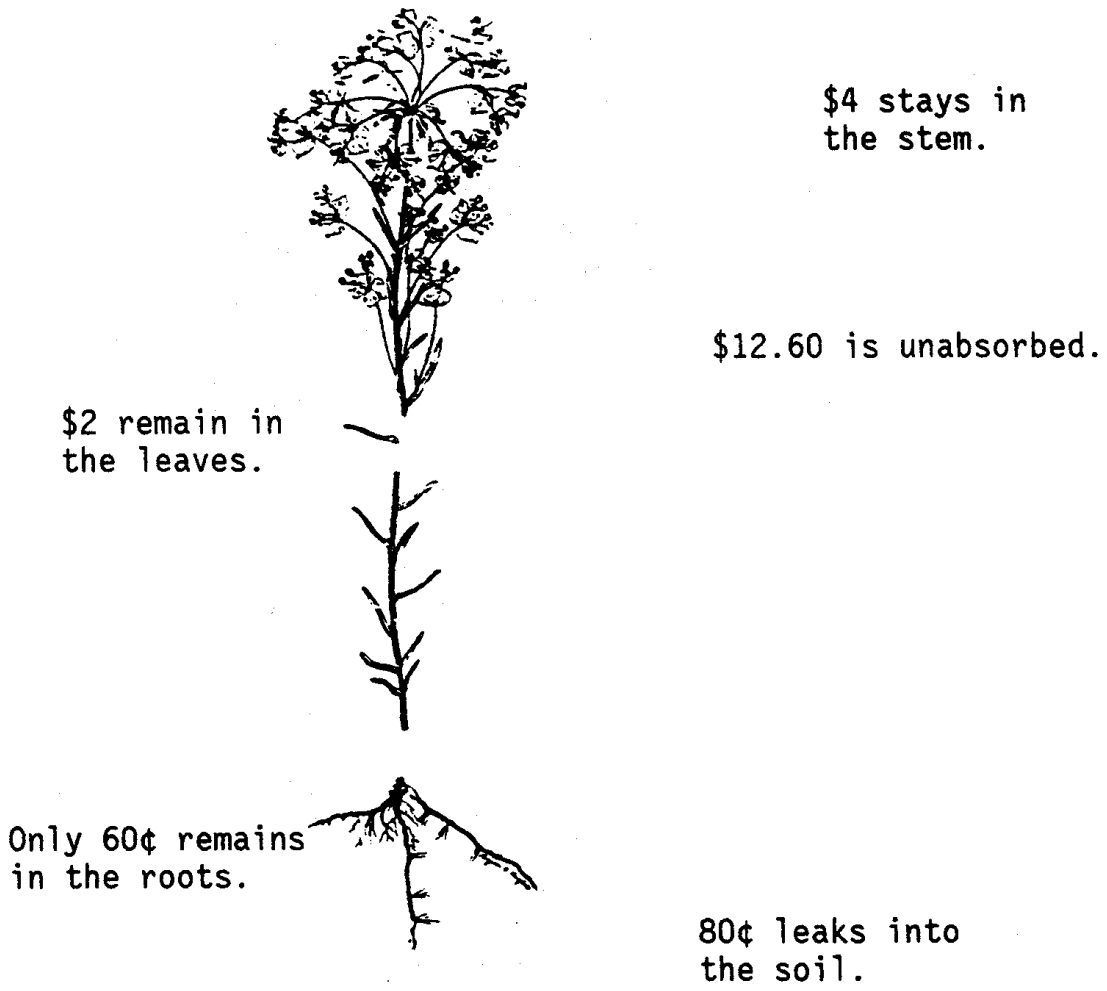

Figure 1. Distribution of picloram in leafy spurge following a $20/A foliar application.

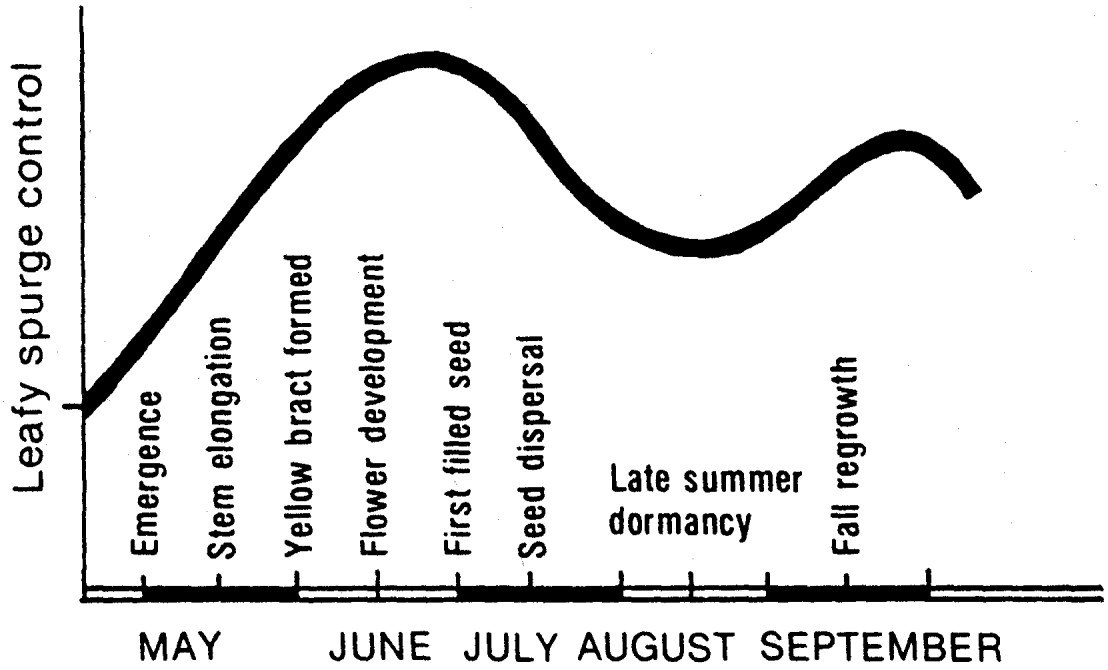

Figure 2. Susceptibility of leafy spurge to picloram applied at different times during the growing season.

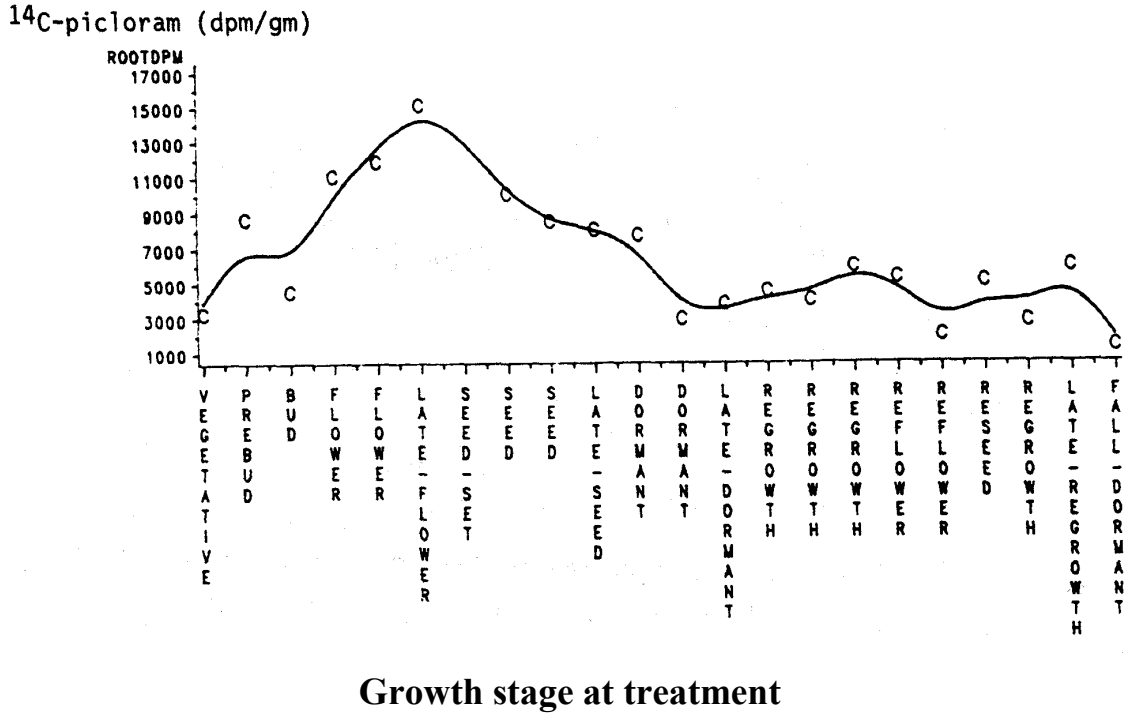

Figure 3. Picloram translocation to leafy spurge roots.