CONTROLLING WEEDS IN A GRASS-LEGUME MIXTURE

Mark J. Renz[1]

Weeds can affect the establishment of any perennial system, especially forages. For example Hoy et al. (2002) found alfalfa fields with high densities of weeds resulted in reduced alfalfa plant densities > 50%, and others have documented similar results (Lanini et al., 1991; Simmons et al. 1995). Researchers attributed the loss in establishment from competition for soil moisture and light (Lanini et al., 1991; Simmons et al., 1995). Fortunately Wisconsin's climate during typical establishment periods is favorable and typically soil moisture is adequate to prevent reductions in establishment. While light can be limiting, mowing/harvesting the first cutting at the appropriate timing can limit this effect. So why do we still manage weeds in establishing forages? These weeds can result in reductions in establishment in abnormally dry years and lower forage quality in the first and sometime second cutting.

This same principle holds when establishing grass-legume mixtures. Although much interest exists in combining legumes and grasses, integrating these two forages limits weed control options. The sections below highlight what the limitations and options are for weed management in establishing and established stands as management decisions will need to be made at each of these timings of the crop.

Establishing Mixture

Currently most producers rely on herbicides to assist in the establishment of perennial grasses or legumes. These herbicides typically target annual and biennial weeds as they are the most common in newly seeded fields. If perennial weeds present, consider managine prior to planting as they are difficult to control while establishing forages. Of the ten herbicides registered for use in establishing legumes, only 2,4-DB (e.g.,Butyrac) and bromoxynil (Buctril) will provide weed control. These herbicides, while effective, should provide limited injury to establishing grasses and legumes depending on the stage of growth of forages at application. 2,4-DB tends to be more injurious to young grasses, therefore applications should be applied to grass seedlings that have >5 leaves or are tillering. Timing of these herbicides with respect to weed size is also critical, with the level of control declining significantly with weeds taller than 3 inches. While these herbicides are effective on most common broadleaf weeds, annual grasses will not be controlled.

Weed management decisions in this situation should be based on weed density, and soil moisture. If weed density is low and soil moisture is adequate then successful establishment should result without the need of any management. Realize that not managing these weeds will result in lower forage quality with high amounts of weeds as a component of the forage in the first one to two cuttings. Thus growers should have a market for this lower quality hay, otherwise weed species should be managed regardless of density.

[1] Extension Weed Scientist, Dept. of Agronomy, 1575 Linden Dr., Univ. of Wisconsin-Madison. mrenz@wisc.edu

Established Mixture

If establishment of grass-legume mixtures is successful, likely little management of weeds will be necessary until stands thin due to age, disease and/or weather. Weeds in established forages are typically perennials and are difficult to remove unless herbicides registered for use in either grass or legume forages are used. Unfortunately these herbicides will typically result in extensive injury to the non-labeled forage species. Therefore few options for weed management exist in mixed grass legume stands besides proper management of forages that promotes healthy growth and competition.

Typically as these mixtures age, the legume component begins to decline and the grass forages dominate. As legumes decline, if forage species cannot fill the void left, perennial weeds will appear and require management with a herbicide. While these can be controlled, typically this results in extensive injury to the remaining legumes. If growers wish to keep the forage grass only field in production they can use a range of herbicides registered for use in pastures to suppress weeds in question. Although this treatment will be effective it will also likely remove the remaining legumes of the field. If a significant legume component is desired field renovation can be conducted to replace this feature, but planting of the legume should wait until after the plant-back interval listing in the herbicide has passed.

Conclusions

Legume-grass mixtures are competitive forages that are a viable option for Wisconsin production, but few options exist for weed management. When these forages are establishing, control of annual and biennial broadleaf weeds can be made with well timed applications of 2,4-DB (e.g. Butyrac) and bromoxynil (Buctril) when weeds are small ($\leq$ 3 inches tall). If difficult to control weeds are present in a field being considered for this crop combination, they should be controlled prior to establishment. Once forages are established they are typically very competitive until the legume component thins. At this point no viable management option exists for common weeds (perennials) that fill this gap without damaging one of the two forages. Thus at this stage it is recommended to either rotate to another crop or apply a herbicide to the target weed and accept the injury to the minor forage present in the field (usually the legume).

References

Hoy, M.D., K.J. Moore, J.R. George, and E.C. Brummer. 2002. Alfalfa yield and quality as influenced by establishment method. Agron. J. 94:65-71.

Lanini, W.T., S.B. Orloff, R.N. Vargas, J.P. Orr, V.L. Marble, and S.R. Grattan. 1991. Oat companion crop seeding rate effect on alfalfa establishment, yield and weed-control. Agron. J. 83:330-333.

Simmons, S.R., C.C. Scheaffer, D.C. Rasmuson, D.D. Stuthman., and S.E. Nickel. 1995. Alfalfa establishment with barley and oat companion crops differing in stature. Agron. J. 87:268-272.