Weed Management During Forage Legume Establishment

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Introduction
Weeds are a major impediment to establishing legume forage crops. Annual and perennial weeds generally have more seedling vigor and compete more aggressively for resources than forage legumes (38,43). Consequently, weeds can decrease the stand density, shoot and root dry matter yield, and quality of legume forage crops during establishment (27,31,38,49). Reduced or complete establishment failures are rather costly because they result in lost production, the lack of return on labor and inputs, and the need to invest in replacement forage crops or feed. Weed management strategies that prevent stand, yield, and quality losses are integral to successful establishment of forage legumes.

Numerous strategies are used to successfully manage weeds during forage stand establishment; however, the effectiveness of each varies greatly. The purpose of this management guide is to outline strategies that are known to control weeds. These "best management practices" are categorized as preventative, physical, and chemical weed control, but it is important to remember that a combination of these strategies is often required to properly control weeds during legume establishment.

Preventative Weed Control
Promote a vigorous stand. A vigorous and healthy stand is the best, first line of defense against weeds during the establishment of forage legumes (38,43). It is critical for the forage manager to pay close attention to basic agronomic practices. The first criteria is to utilize well-adapted varieties/species for a given soil and environment, since legumes generally show more site-specific adaptation than grasses. Utilizing legume seed inoculated with the proper rhizobia will improve establishment by increasing seedling vigor, and result in faster canopy closure and ground cover to reduce weeds. Rhizobia are generally very host specific; therefore selecting the appropriate strain specific to a given legume is one of the most important considerations for establishing legumes. Table 1 summarizes the commercially available inoculants that are recommended for each forage legume species listed. Other important considerations to improve establishment success include planting date, seedbed preparation, seeding depth, and seeding rate for the selected legume. Additionally, previous crop residue should not be allowed to interfere with seedling development; proper crop rotations should be practiced to avoid the buildup of certain weeds or other pests; and there should be sufficient moisture in the soil to allow for rapid seed germination, emergence, and stand development (Fig. 1).