Establishment of Perennial Cool-Season Grasses Depends on Controlling Winter Annual Weeds

Cool-season perennial grasses have potential to improve seasonal forage distribution in the Great Plains as a complement or alternative to cool-season annual grasses. In addition to developing new, improved perennial cultivars for grazing, Noble Research Institute researchers also studied the best protocols for getting the new forages established in the face of competition from annual grassy weeds.

Currently, the majority of beef and dairy cattle producers in the Great Plains rely primarily on cool-season annual grasses for grazing during autumn to spring. In recent years, however, there is an increased interest from livestock producers in shifting from annually sown cool-season forages to more permanent perennial cool-season grass systems to remedy several downsides to the annual grasses:

- Unpredictable precipitation in autumn often delays planting of annual grasses, resulting in a lack of high quality forage for grazing during winter to early spring.
- Producers are concerned with the production cost of annual forages.
- In the Southern Plains, planting of annual grasses requires land to be fallowed for prolonged periods. Consequently, precipitation and wind cause a substantial loss of top soil and nutrients.

Figure 1: A spring-plus-autumn application of glyphosate to prevent seed production in the spring and to control emerged winter annual weeds in the autumn at the time of sowing resulted in greater establishment of cool-season perennial grasses.
PERENNIAL GRASSES: ADVANTAGES AND CHALLENGES

Cool-season perennial grasses have forage potential in the southern regions and have lower production costs compared to cool-season annual grasses since they do not have to be reestablished each year. That being said, there are challenges to overcome for successful establishment of the perennial grasses.

Producers who consider planting cool-season perennial grasses will more than likely attempt to convert existing fields where they have traditionally grazed out wheat and/or have volunteer annual ryegrass. However, naturally reseeding annual grasses like ryegrass or rescuegrass can be more competitive than perennial grasses during establishment, which may result in complete stand failure of the sown perennial grasses. Currently there are no herbicides labeled for controlling annual grassy weeds in newly established perennial grasses, therefore cultural practices and management will play an important role in their establishment.

With the release of several perennial cool-season cultivars developed at Noble Research Institute during the last few years, researchers understood that reliable establishment methods must be developed to help producers be successful with these new and improved perennial forages. In order to develop such a protocol, we conducted several experiments near Vashni, Texas. The studies were designed to determine the optimal planting date and seeding method for establishing cool-season perennial grasses into pastures infested with annual grassy weeds controlled through either grazing or herbicide application.

ESTABLISHMENT STUDIES COMPARISON WEED-CONTROL AND SEEDING METHODS

In Experiment I (no spring glyphosate application), the ryegrass pasture was continuously grazed through May, and no glyphosate was applied in the spring prior to perennial grass seedling in the summer. In Experiment II, 1 pound of active ingredient per acre of glyphosate was applied in early May to control annual grasses and prevent seed production. Seedbed preparation for both experiments included conventional tillage with an offset disk in late summer (August), followed by a drag harrow and roller packer to ensure a level and firm seedbed. The September planting date was seeded to dry soil, while the October and November planting dates were seeded seven days after autumn precipitation occurred to germinate weeds, which were then sprayed with glyphosate at 0.75 pound of active ingredient per acre within two days of planting. In Experiment I, this treatment resulted in a single autumn application of glyphosate; in Experiment II, this resulted in a sequential spring-plus-autumn application of glyphosate to prevent weed-seed production in the spring and to control emerged weeds in the autumn.

Establishment of cool-season perennial grasses was very poor in Experiment I (no spring glyphosate application) (Figure 2), while establishment in Experiment II (spring glyphosate application) (Figure 1) was good to excellent, even though precipitation was below the long-term average in both years. Planting in October followed by an autumn application of glyphosate after weed emergence but before grass seedling emergence resulted in greater establishment and higher subsequent dry matter production. Drilling seed also resulted in greater establishment and production than broadcasting.

SEEDING AND HERBICIDE RECOMMENDATIONS

Based on this data, it is recommended that producers:

• Control annual weeds in spring prior to planting.
• Drill seed in autumn (late September to October) following declining temperatures and adequate rainfall to germinate weeds.
• Apply glyphosate to control emerged weeds.

This will provide the best chance for these cool-season perennial grasses to establish in fields known to have annual grassy-weeds.

Alternatively, cool-season annual grasses can be effectively controlled using Clearfield wheat technology the season prior to establishing cool-season perennials. Clearfield wheat is a non-GMO cultivar that is tolerant to the imidazolinone herbicides (such as imazamox). It’s important to select a two-gene cultivar, which indicates the Clearfield wheat cultivar has two genes that confer resistance to the herbicide. This will allow the wheat to withstand having a methylated seed oil added to the herbicide, which can greatly improve the herbicide efficacy on winter annual grassy weeds such as rescuegrass. Seed of the cool-season perennial forage can then be no-tilled into the wheat stubble the following fall.

In summary, if you are considering sowing an improved cool-season perennial grass, plan ahead to control winter annual weeds prior to and at planting time, and use a drill rather than a broadcast-and-roll system. Of course, you also will need to:

• Test soil for proper fertility.
• Plant when soil moisture is expected.
• Plant late enough to avoid high soil temperatures, but early enough for seedlings to reach at least the five-leaf stage before the first hard freeze.

If you can meet all these requirements, you have an excellent opportunity to have a quality, cool-season forage source for many years to come.