

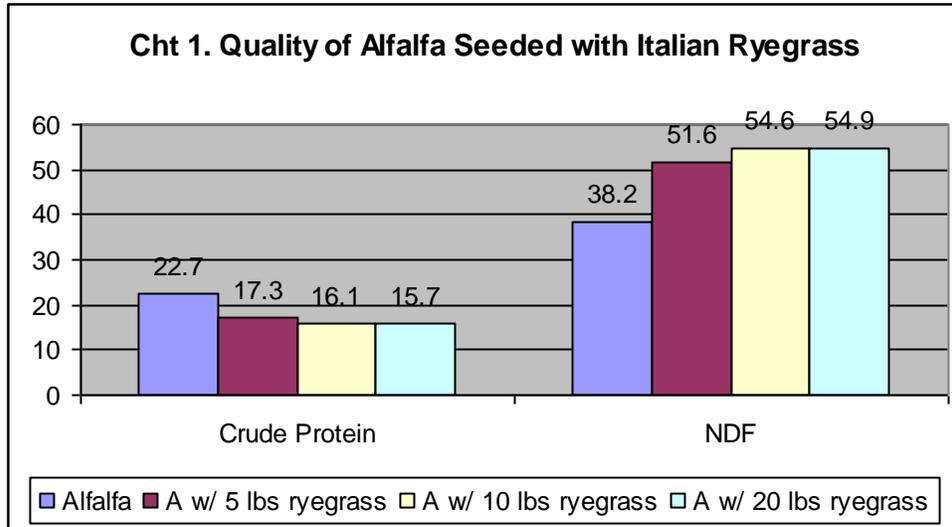
No-till Planting of Alfalfa with Italian Ryegrass
by Nick Schneider, Winnebago County Agriculture Agent

Benefits and risks of establishing a forage crop through no-till planting are often weighed and measured with popular opinion. Due to the generally cold springs with prolonged wetness, forage growers are understandably skeptical about using no-till in north-central Wisconsin. However, with an ever increasing emphasis placed on saving time, reducing tillage cost, and preserving top soil for compliance of 590 nutrient management plans more farmers have successfully tried no-till crop establishment.

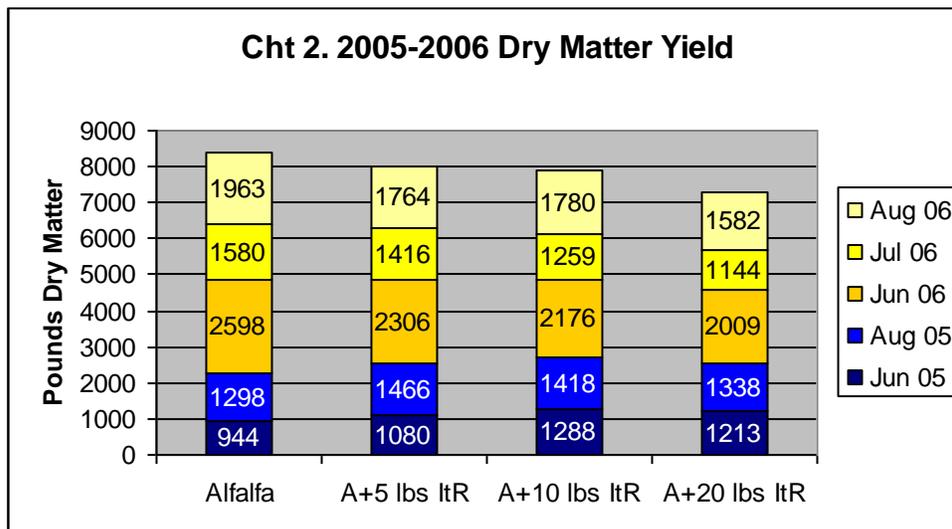
As a field demonstration at the 2005 Farm Technology Days hosted by Malm's Rolling Acres north of Loyal, alfalfa was no-till seeded with Italian ryegrass in both grain corn residues and soybean residues. Alfalfa was seeded alone at 18 pounds per acre and with 5, 10, and 20 pounds per acre of Italian ryegrass. Two alfalfa varieties were used, a conventional variety and a potato leafhopper resistant (PLH) variety. Plots of first and second cuttings were harvested on June 28th and August 18th respectively. Samples from the second harvest were analyzed through NIR for crude protein and NDF. Research continued in 2006 in order to evaluate yield responses in subsequent years. The established alfalfa was then harvested on June 2nd, July 8th, and August 15th and evaluated for yield only. Potato leafhopper populations did reach economic treatment thresholds in July of 2006. Insecticides were not applied. Results were statistically analyzed and compared at the 95% confidence level.

Variety Selection: When alfalfa was mixed with Italian ryegrass, the grass component seemed to influence quality and yield more so than the alfalfa variety. When evaluating the alfalfa varieties without Italian ryegrass, crude protein and NDF were not significantly different. Final yield was the same between the conventional and PLH variety throughout 2005 and the June harvest in 2006. Due to potato leafhopper presence in the summer of 2006, the PLH variety had a higher yield for the year by 105 pounds of dry matter. The 2-year yield averages were the same for varieties. For the purpose of the remaining discussion, the data from the alfalfa varieties were combined.

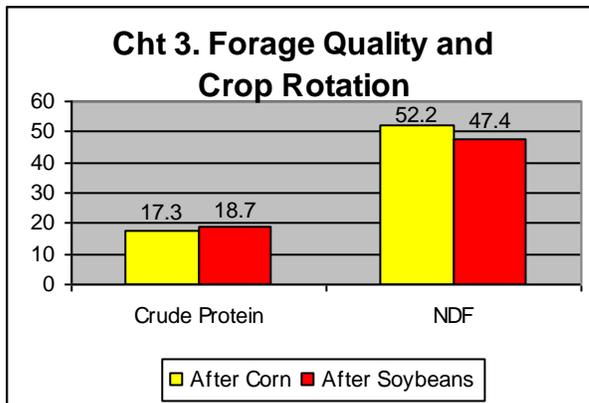
Italian Ryegrass Seeding Rate: Italian ryegrass influenced crude protein, NDF, and final yield when compared to alfalfa seeded alone. Solo seeded alfalfa had a crude protein that was 5 to 7% greater than treatments with Italian ryegrass and lower NDF. The Italian ryegrass quality found in this study was lower than other studies because it initiated seed heads. Among treatments with Italian ryegrass, a 5 pound seeding rate resulted in higher crude protein and was more digestible than treatments with 10 and 20 pounds of Italian ryegrass, which had no quality differences (Chart 1). In the planting year, solo alfalfa had a lower final yield. Alfalfa seeded with 5, 10, or 20 pounds of Italian ryegrass yielded 303 to 464 more pounds of dry matter.



Data indicated increasing the Italian ryegrass seeding rate in the planting year resulted in a decrease of dry matter yield the following year in the established alfalfa. As anticipated, there were very few Italian ryegrass plants randomly scattered among the alfalfa plants. In the plots with Italian ryegrass in 2005, some of the seed production contributed to Italian ryegrass germination in 2006, however, the alfalfa competition prevented this Italian ryegrass from establishing. In 2006, the yield of alfalfa established alone yielded 655 pounds more of dry matter than the alfalfa established with 5 pounds of Italian ryegrass. The yield of the established alfalfa decreased even further as the Italian ryegrass planting rate increased. When Italian ryegrass was seeded at 20 pounds per acre with alfalfa in 2005, in 2006 the yield was 1406 pounds less than alfalfa alone. This reduction of 2006 yield was likely caused by a reduction in alfalfa stem density. There were 63, 42, 36, and 30 alfalfa stems per square foot when Italian ryegrass was seeded at 0, 5, 10, and 20 pounds per acre respectively. The final two-year cumulative yield showed that alfalfa seeded alone or with 5 pound per acre of Italian ryegrass had a statistically similar yield that was greater than the other treatments (Chart 2).



Crop Rotation: Crop rotation had a measurable influence on yield, crude protein, and NDF during the establishment year. Alfalfa and Italian ryegrass mixtures averaged 515 more pounds an acre of dry matter when seeded after soybeans rather than grain corn. Most of the additional yield resulted from growth in June collected during the first harvest of 2005. Quality was also better when planting followed soybeans with crude protein being higher and NDF lower (Chart 3). For 2006 and the final two-year yield average, there was no difference in established alfalfa regardless of planting in 2005 after corn or soybeans. Crop rotation did not influence the number of alfalfa stems present at the end of the planting year. Quality was not measured in 2006 since all stands were pure alfalfa.



Soil Erosion: A simulation was run using SNAP Plus software to estimate the soil loss with fall chisel plowing versus no-till. Field parameters were set at a Loyal silt loam with a 4% slope. The two-year average soil loss was reduced by 0.4-0.5 tons per acre when using no-till. Adding a grass to the seeding mixture reduced top soil erosion even further by 0.1- 0.2 of a ton per acre.

Conclusions:

When potato leafhoppers were present, there was a yield advantage to planting a PLH alfalfa variety. Under no potato leafhopper pressure, yields of a conventional and PLH alfalfa were similar.

There was a modest yield and quality improvement of the forage stand during the seedling year when planting after soybeans as compared to corn. However there was no yield difference in the established stand or the combined two-year yield average.

If establishing alfalfa with Italian ryegrass, select a variety that typically does not set seed heads in the planting year. It is believed the Italian ryegrass quality found in this study was lower than other studies because the Italian ryegrass initiated seed heads. As the seeding rate of Italian ryegrass increased, quality decreased and yield in the established stand the following year decreased. These results indicated planting Italian ryegrass beyond a rate of 5 pounds per acre with alfalfa will have a detrimental effect.

The University of Wisconsin recommends seeding Italian ryegrass as a cover crop at 2-4 pounds an acre. If using Italian ryegrass for renovating an existing forage stand use 5-10 pounds an acre or pure ryegrass forage plant at 20-25 pounds an acre.

No-till planting is a viable option for establishing alfalfa.

Prior to planting no-till, use a burn-down herbicide to control perennials, winter annuals, and early emerging spring annuals such as common lambsquarters.