Can I apply Nitrogen to my grass hay fields in the fall?

Dr. Tarlok Singh Sahota CCA

The simple answer to this question under our agro climatic conditions is "Yes". A report from the Turf Grass Institute, Guelph in the Ontario Farmer in 2007 indicated that nitrogen (N) applied to the Turf Grass in early fall was stored in the crown and it resulted in early/better growth of the grass next spring. I thought of testing this idea in two forage grasses (timothy and bromegrass) at TBARS Thunder Bay, because application of N to grasses in early spring was the recommendation and the norm. The replicated experiment was laid out and seeded in spring 2008 with 7 N treatments in both timothy and bromegrass. These were no N (check), urea applied @ 70 kg N/ha on September 25, October 10, October 25, November 10, ESN @ 105 kg N/ha on September 25 and urea @ 70 kg N/ha in early spring (standard practice). All urea treatments were supplemented with 35 kg N/ha after the first cut; thus the total N applied with urea/or ESN was equal. Averaged over three years (2009-2011), the results revealed that:

- The interaction between the grass species and N fertilizer treatments was not significant. In other words the treatments effect was similar in the two grasses.
- Dry matter yield (DMY) of bromegrass (5.09 t/ha/yr) was higher than that with timothy (4.34 t/ha/yr). However, timothy DMY was less than bromegrass only in 2009 when 102 mm of total 285 mm rain was received in August. First cut protein content was higher in bromegrass than timothy and the reverse seemed to be true for the second cut. First cut accounted for 71-75 % of the total yield.
- Averaged over two grasses, application of 105 kg N/ha increased the DMY by ~2 t/ha/yr and first cut protein content by 1.2-2.5 % point.
- DMY with ESN (5.21 t/ha/yr) applied on September 25 equaled that with urea applied on September 25 (5.16 t/ha/yr)/or in early spring (5.15 t/ha/yr). Each 15 days delay in fall application of urea from September 25 to November 10 reduced the DMY only marginally.
- First cut protein content with ESN (14.9 %) applied on September 25 was higher than that with urea applied on September 25 (13.7) or in early spring (13.2 %). Protein content in the second cut didn't vary much with the N treatments.
- At equal N rate (105 kg/ha), N removal by the grasses was higher with ESN applied on September 25 (118 kg/ha/yr) than with urea applied on September 25 (108 kg/ha/yr) or in early spring (105 kg/ha). Thus ESN was more efficient source of N than urea.

Now the question arises; if ESN is giving only as much DMY as urea, why would one prefer ESN to urea? Because (i) ESN had to be applied only once, whereas urea was applied twice (70 kg N/ha in the fall/or early spring and 35 kg N/ha after the first cut), and (ii) the protein yield (total from two cuts) with ESN (738 kg/ha/yr) was significantly higher than that with urea (675 kg/ha/yr with part applied in fall and 657 kg/ha/yr with part applied in early spring). The monetary value of extra protein from ESN ($161-207/ha) as compared to urea would be much more than the extra cost of N from ESN ($47/ha) as compared to urea. In another experiment on timothy at TBARS, it was found that four years regular annual applications of ESN to timothy increased the timothy DMY by 600 kg/ha in the fifth year when no N was applied; urea on the

contrary had no such residual effect. Therefore, you may consider applying ESN to your grass hay fields and that too in the fall.

Published in Northwest Link, September 2012, Pages 6-8!