Growing triticale silage in the Northeast

Winter triticale acreage has dramatically increased across the Northeast the past three years, with over 30,000 acres in NY alone planted for 2014. Plagued by drought, deluge and stubbornly low haylage yields, many dairy farmers have embraced this new forage over other small grains.

Winter triticale combines many of the desirable traits of cover crops, with the ability to consistently produce profitable yields of high quality forage in a single cutting. It is a cross between wheat and rye, resulting in excellent winter hardiness, quick establishment, dense tillers and a later heading date than rye. Farmers with long-term experience growing winter triticale typically plant it after corn silage in September and harvest two to three tons DM/acre of milking cow quality feed the week before first haylage harvest the following spring. The silage is typically cut when the triticale is at the flag leaf stage (Feekes 9.0), Figure 2.

If harvest is delayed a week until the boot stage (Feekes 10.0), yields increase, but forage quality declines. Boot stage silage is usually fed to heifers, dry cows or beef animals. Nutritionally it’s not a straight-up replacement for haylage or corn silage. Most triticale has moderate levels of crude protein (CP 14% to 18%), high levels of fiber digestibility, moderate to high sugar levels and high rates of digestion in the rumen. Initial work from Cornell University has found that about every 20 lb/acre of spring nitrogen fertilizer increases CP by 1%. Fiber digestibility levels are higher with earlier harvest timing. Harvest sugar levels are most likely for farmers who use “haylage in a day” harvest management, which limits respiration.

Overcoming Adoption Barriers:
Farmers who successfully grow winter triticale silage have a commitment to make the necessary changes to their forage management system. These changes start with the previous corn silage crop. Growing shorter relative maturity corn silage hybrids are needed to plant triticale in September. While corn variety trials often show a 0.2 to 0.25 ton DM/acre corn silage yield decrease every five days earlier RM, on average, yield variability is extreme among varieties in yield within each maturity group, Figure 3.

Many earlier maturity corn silage varieties have equal and even higher yields compared to later maturity hybrids. Planting in 15 or 20 inch rows, compared to 30 inch rows, and increasing corn plant populations can also increase silage yields. Weather conditions strongly influence corn silage harvest and winter triticale planting date. Extremely dry years (2012) will move corn silage up to late August, while extremely wet years (2013) will push corn silage harvest back to the end of September. Fortunately, above average fall temperature this year helped the establishment of all small grains, as planting was pushed back to October, and in some cases early November. Winter triticale fits very well after vegetable crops, soybeans and occasionally small grains or an old haylage field.

The best way to plant winter triticale is to drill 1.5 inches deep. Seeding rates are typically two to three bu/acre (about 100 to 150 lbs/acre). Some farmers plant triticale with air flow fertilizer applicators followed by some form of tillage or packing. Triticale that isn’t drilled has shallower roots, is easily damaged from heaving, has more spring weeds, may winterkill in some environments and has less soil coverage. These problems are worse with later planting dates. Planting bin-run or saved seed does not have the seed quality or the genetic potential compared to a certified variety that is properly cleaned, processed and tested for germination.

Spring nitrogen rates on small grain silage (mostly triticale) were tested at 45 NY locations in 2013. We found 15 of the fields did not respond to fertil-
izer, but 29 fields needed high rates of nitrogen (75 to 100 lb/acre) for maximum yields of small grain silage. Required rates of P and K for triticale silage are not established, but are likely similar to current small grain recommendations based on soil test levels. Adding 15 to 20 lb/acre of sulfur is likely beneficial in situations without manure. Spring applications of ammonium sulfate (AMS) with a stabilizer are currently recommended. Observations from 2013 indicate that applying nitrogen earlier in spring to winter triticale silage may be better than April. Similarly, green-up nitrogen applications increase small grain yield more than grain CP. Prior to planting winter triticale, many farmers incorporate 5,000 to 8,000 gallons/acre of manure. Fall and spring nitrogen rates in combination are currently under evaluation at nine NY locations.

Harvest timing of winter triticale silage is the week before first haylage harvest, often as corn planting is underway. For triticale silage to work, corn planting, and possibly haylage harvest, will have to wait. This manpower strain, and the fall planting labor crunch, is the biggest limiting factor to growing more acres of triticale silage. Many farmers top out at 150 to 200 acres, but some grow over 500 acres.

Drying triticale silage is more difficult than haylage because of the high tonnage. When cut, between 10 and 15 tons/acre of material are in the field (two to three tons DM/acre at 80% moisture). Maximizing swath width is critical. Only the exposed outer ¾ inch of the swath dries quickly, so the closer the swath width is to cutter-bar width, the better. After three to four hours the swaths need to be tedded to expose the silage inside the swath. Tedding operations must be done at low enough tractor speeds to prevent the formation of large lumps of material that do not dry. Many farmers have also learned the hard way that tedders can end up as a pile of scrap metal if operated at high speeds through heavy loads of triticale silage. The combination of wide swaths and tedding gives the best chance to chop silage at >30% DM the same day as cutting. If the triticale silage is chopped at DM content below 30%, theoretical length of cut should be increased to at least one inch to prevent high levels of leachate in the bunk or bag. Drying triticale silage was challenging in 2013 with mild temperatures and very wet conditions during May. Many farmers left triticale silage in the field overnight to dry down further. However, a number of farmers were able to harvest the same day as cutting, through a combination of committing to wide swaths and the extra field operation of tedding. A survey of triticale silages after ensiling in Northwestern NY this summer reflected the lower DM content of these silages this season. As a result, butyric acid levels were between 0.5 and 1.0% of DM in most samples. However, most triticale silage samples also had high levels of lactic acid in addition to desirable pH, CP and fiber digestibility levels.

Appropriate post-harvest management of winter triticale silage fields is part of a successful forage system. Triticale silage does not regrow, as a number of farmers claimed in 2013. When small grains are under stress, a portion of the tillers elongate into stems. During early to mid-April much of NY and the Northeast did not have rainfall during a rapid growing phase of winter triticale silage. This resulted in a yield potential loss of about 25% due to incomplete tiller elongation. By harvest time in mid-May the rains had returned, which caused the remaining 20 to 30% of the tillers to elongate, and the alleged “regrowth.” In most cases this second flush did not amount to more than 0.5 ton of DM/acre, making a second harvest unjustifiable. Most corn herbicide programs effectively control triticale. The best tillage systems for corn establishment after triticale silage are zone builders/strip tillers or a no-till planter with very aggressive coulters. Soybeans no-till well into triticale stubble. Corn silage is planted later on triticale ground. Some anecdotal data from the Midwest in 2013 suggests up to 0.25 ton of DM can be lost for every five day delay in planting, but there is little evidence for this in the Northeast. Yields of early-planted versus late-planted corn silage have not had consistent trends the past decade in this region. In a worse-than-average scenario, a farmer would give up 0.25 to 0.50 ton DM from corn silage on the front end by delayed planting, and the back end from early maturity. Most farmers get at least two tons of DM from triticale without taking those levels of yield hits to their corn silage.

Looking Towards the Future: Despite some production challenges, winter triticale seed supplies have sold out the past three seasons in the Northeast. It is also a very common dairy and beef forage in the Pacific Northwest and Southeast. Winter triticale acreage is not the scale of corn silage or haylage, but it has become the dominant small grain grown for silage. Increasing land costs, the widespread trend of high forage diets and rising demands for milk from the yogurt industry are driving a region-wide push to increase forage yields. A double crop system of corn silage with winter triticale will out-yield the haylage-corn silage rotation at a fraction of the harvesting costs. While eight to 10 DM tons/acre of haylage is possible, it’s rarely achieved. Double cropping triticale with corn silage can consistently produce 10+ tons/acre. As recommendations are refined and farmers gain more experience with triticale silage, it would not be surprising if haylage acreage shrinks considerably in the next decade across the Northeast.