ADVANCED AG SYSTEMS'S

# Crop Soil News

http://www.advancedagsys.com/

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"It is the crops that feed the cows that make the milk which creates the money."

Advanced Ag Systems
Research, Education, Consulting

## Red clover: Yesterday's Forage in Tomorrow's Rotations

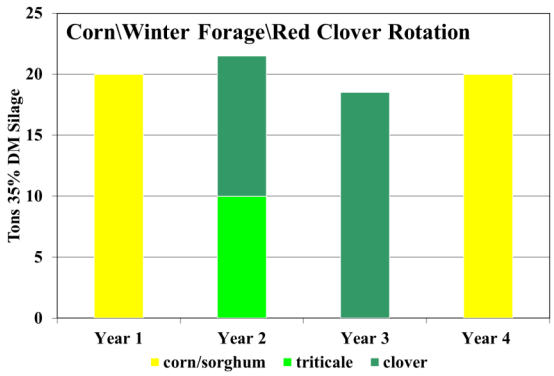
The biggest criticism with red clover, it's perceived difficulty getting it dry enough to put in storage; was dealt with in the November 2013 newsletter available at http://advancedagsys.com/november-2013-red-clover-old-forage-for-modern-dairy/. NY Farm Viability Institute funded research clearly showed, under very adverse drying conditions; that we could get **red clover to >35% dry matter the day it was mowed.** As with any crop, there are no silver bullets. The crop and cropping system has to fit into the farm operating system. Red clover has that ability and brings with it a number of economic, environmental, and sustainable benefits.

Clover is an **aggressive, shade tolerant, nitrogen fixing, high quality dairy protein source**. It is easier to establish than alfalfa. Unfortunately, in the northeast, especially NY where we are located, clover root curculio and clover crown borer still limit the crop to seeding year plus 1 or possibly 2 years. Improved varieties are a huge yield leap over the cheap common red clover seed but do not stop the insects. Note: we have preferred the hairy type to those with less hairs if we are making silage. Those with less hairs are high quality forages, but are susceptible to potato leaf hopper injury. We saw that clearly at the Cornell Valatie Research farm where ½ of a red clover field was the hairy type, while the other was the low leaf hair type. The IPM scout found the low hairy leaves variety had tremendous numbers of leafhoppers while the half with the very hairy leaves had few. The hairy type eliminated the need to control leafhoppers. This is critical for organic dairies and an economic advantage for traditional dairy farms that are making clover silage.

The shorter rotation of red clover means that seeding year comes up more frequently. Most farms view seedings with trepidation and concern for higher risk of crop failure; and the economic impact of pouring money into a crop year that may not give much yield. Add the seed cost and effort of picking rocks that are abundant in many soils, and we can understand farmers' reluctance to go to shorter rotations. Unfortunately, basing all the decision on one crop year of a multi-year cycle blinds the management decision to many advantages that occur in the rest of the crop cycle. They are also blinded to the fact that corn following corn is a ONE YEAR rotation of the same crop – you can't get much shorter than that.

On multiyear corn rotations, there often is not enough nitrogen generated on the farm (quantity, losses through daily spread, or distance from the manure source) to meet the crop needs. Thus you add 120 – 160 lb/A of nitrogen for corn crop. This directly adds $60 - $80/A to **the cost of the forage** you put in front of the cow but adds **no additional yield to pay for it** when you compare to first year corn after legumes that only needs starter nitrogen for generating that yield. http://nmsp.cals.cornell.edu/publications/factsheets/factsheet21.pdf . Piling on the cost, is very expensive stacked seed genetics to control the corn pests in year after year corn. Corn rootworms are not a problem in first year corn and infrequently a problem in second year corn and nearly always a problem in third year corn. Yes, you can control them with genetics, but at increasing cost / ton of forage

reaching the mouth of the cow. Add to it the fact that many of our non -perfect soils from Minnesota to New Brunswick, Ontario to Virginia, deteriorate at a rapid rate under long/continuous corn rotations and the economics of this system quickly become questionable; yet we still use continuous single crop rotations and ridicule shorter multi-crop rotations.



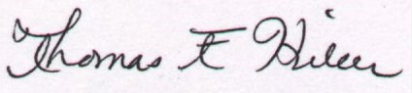

Red Clover fits shorter rotations very well. A short rotation of 1 year corn, followed by winter forage and frost seeded red clover is highly efficient and high yielding. **Seeding year generates 6 – 12 tons of very high quality silage** from the winter forage even before the first cutting of clover is made. After two years of high clover yield you can fall kill and no-till, or spring plow, and then plant **corn for 15 – 20% yield increase** due to rotation effect, no root worm issues, and all the nitrogen needed to grow the crop. http://nmsp.cals.cornell.edu/publications/factsheets/factsheet60.pdf Utilizing **no-till** for the corn, and minimum or no till for the winter forage and frost seeded clover; stone picking and soil erosion is minimized. Realistic yields of this system (see graph above) are consistently high as the corn is planted into a sod each time in the cycle giving a 15-20% increase over non rotated corn. Rootworms and corn diseases can't build to high economic levels as the crops are quickly switched from summer energy crop to winter forage to perennial legume, and back to summer energy again. The most important issue to farmers in this system, is that the **clover** with even a modicum of good management (soil test, liming), **establishes very well** and with few if any weeds. It is a shade tolerant and aggressive seedling.

This rotation and variations on it are a big factor in maintaining high average dry matter yields, year after variable year, on less than ideally drained ground. For **organic farms** the rotation is especially helpful because 1: it produces high yields of very high quality forage for high forage diets with much less expensive organic grain; 2, it grows its own nitrogen for the summer annual energy crop. As we get more experience with BMR sorghum-Sudans, they could potentially replace the challenge of growing organic corn and the resultant weed issues, in rotations with red clover.

For those hesitant due to limited risk tolerance, the traditional farming system can work. The first year is conventional tilled oats with clover, followed by two years of clover. The first year corn needs no extra nitrogen. By daily spread manure during winter, the second year corn will not need additional nitrogen. You then return to oats/clover. Unfortunately, **soil erosion and degradation occurs** because the soil is left without living material on it over the winters. The use of no till for both the corn and the forage would reduce the erosion loss substantially. Substituting the winter forage between the corn crops, and after the second corn crop would increase the soil structure and organic matter, and nearly eliminate the erosion losses under normal weather. Most importantly, it gives very high yields of very high quality forage between the corn years and before the seeding.

Based on research at Cornell's Valatie Farm, **future rotations** may include BMR sorghums species that also kill rootworm, and are not susceptible to many of the corn diseases. Our experience is that the deer hide in sorghum and come out to eat the corn. We are also developing the Best Management Practices for establishing the red clover at the same time you plant the winter forage (must be planted early enough) after corn harvest. This has been found to greatly increase the clover yield the seeding year. The nice part of this potential system is that if you have legume seeding failure in the fall, you can get a second chance at frost seeding time without losing a season of yield.

Sincerely,



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