



ADVANCED AG SYSTEMS'

# 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

## Rotations

Rotations are one of those things everyone talks about but not everyone practices. Unless you have all your fields written and a rotation planned for at least the next 5 years or at least the length of the rotation on that field, then you are not rotating but simply working fields. To know your rotation, take the number of acres that you can rotate and divide it by the number of years in your rotation. For example: if you work 480 acres and use a 3 corn 5 hay rotation, your rotation is in an 8 year cycle.  $480 \div 8 = 60$  acres in each step of the cycle. That means if you are not seeding down 60 acres/year, you are not rotating. If you only seed down 30 acres a year you don't have a rotation, but sequential monoculture because your rotation cycle is 16 years. Different land groups can have different rotations.

Rotations boost yields. Rotations reduce costs. Rotations decrease or eliminate insect and disease yield robbers. Rotations conserve soil. Rotations can give you a profit margin when the milk price is down.

Farms have a wide latitude in what they can profitably feed dairy cows. Dr. Chase at Cornell once said, "I don't care if it is all corn or all haylage as long as it is high quality forage." You have a wide latitude in storage from uprights to bags, to round bale wrapped, to bunk silos and drive over piles. There is an increasingly wide range of crops that can be grown in your climatic zone. What you can't change is the soil. Yes, you can lime, drain, and increase organic matter and structure, but beyond that a sand will never become a silty loam, and a 10% slope will not become a flat field.

This brings us to the key in using rotations to maximize profits: **Soils Drive the Rotation Which Drives What the Cows are Fed.** This may come as a shock to many nutritionists that only look at the feed pile and not how it got there or what was the cost. You need to decide what grows best on each field and then develop a rotation to optimize the production of high quality forage from those acres. BMR, floury, or regular highly digestible corn silage, bmr forage sorghum, winter forages, alfalfa, red clover, legume grass mixes, intensively managed grasses are all tools to optimize the production from the soil on that field. Any one or mix of choices can produce very high quality forage to support economical high forage diets.

Rotations help you keep more of your money several ways. It has been known for years that first year corn has a 15 to 20% yield gain compared to multi-year corn. This alone can reduce the cost of producing milk, but there is more benefit. Research across NY by Dr. Ketterings from Cornell, has shown that sods, even those with little or no legume can produce top yields with only 30 lbs of N in as starter (see table at right from one site). As the percent legume in the stand

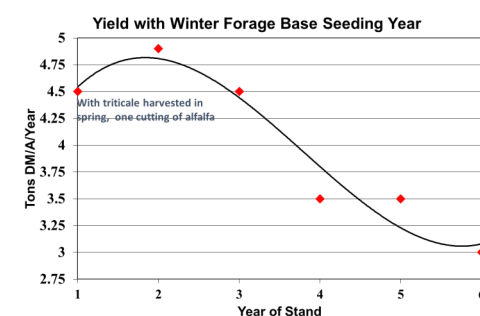
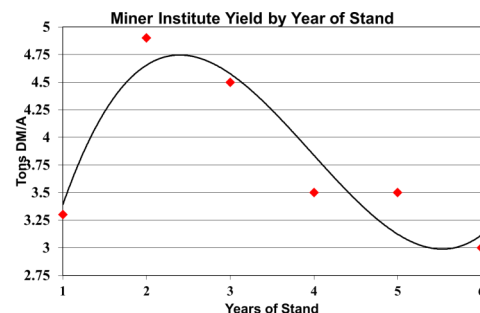
N Sidedress Rate	Corn Silage Yield
	Tons/acre (35% DM)
0 lbs	22.1 a
50 lbs	22.2 a
100 lbs	23.0 a
150 lbs	22.4 a

increases there is even higher N release. Thus there is enough N to grow higher yields than most farmers apply on their best years (if there is only 1 – 25% legume, the soil N + sod N + 30 lbs N starter = 203 lbs of N/a). You can determine your own N supply from sod by going to the Nutrient Management Web site at: <http://nmsp.cals.cornell.edu/software/calculators.html>

Not having to put on extra nitrogen for top yield, not having to buy expensive root worm resistant varieties, and getting a 15 to 20% yield boost; your cost/ton of forage is a lot less than non-rotated fields. When the milk price is low, this lower cost/ton can put a profit edge back in your milk producing margin.

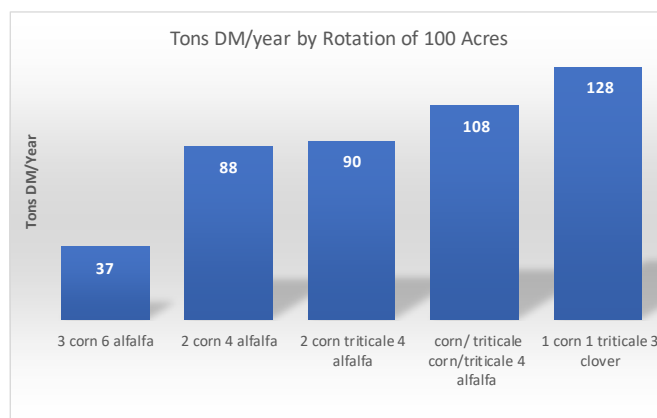
### Benefit of Rotated Legumes

I have worked with a number of farmers that brag they have 7 – 10 year stands of alfalfa. When I look at the field from the truck seat – especially in second cutting – it looks like it is all alfalfa. Getting out, up close and personal with the crop reveals that the stems are far apart and the thin layer of top leaves gives the impression of all alfalfa. Yields meanwhile have plummeted. Lower growing weeds have crept in and comprise a greater portion of the harvested crop. Looking at the graph top right of an excellent study conducted at Miner Institute in New York, you can see that after the 5<sup>th</sup> year the yields dropped below what a new seeding would yield. If you want high yields, you have to rotate. If you have a 100 pound herd average, you are not milking them down to 10 pounds/cow before you dry them off. The same with hay fields, to get high yield you need to harvest at the peak of production. Once off the peak, rotation will allow new fields to come in and old fields to boost the profitability of the rotated corn growing on them.



### Put it all together

Our experience, working with farm's comprehensive written rotations, is that they greatly reduce adverse weather impact while providing much lower cost forage for a profitable ration. Reducing the length of both row crop and haycrop intervals increases yield/acre across the board. As you can see in the graph at right, breaking out of the 3 corn 6 alfalfa (seeding + 5) rotation can increase your yields from 130 to 180% of what you were originally doing. Adding in winter forage (even with a slight potential corn silage decrease from shorter season corn) gives a 10% yield boost to the following corn crop and a direct increase of 2.5 dry matter tons of some of the best forage we can produce on farms today. Even better, adding winter triticale and then after May harvest, no-till seeding into the stubble in early June, gives better seedings, resistant to gully washer rains, and as you can see in the graph in the middle of the page, it increases seeding year yield to equal what a second year alfalfa stand would produce, thus eliminating the seeding year yield shortage. This is discussed further on the web:



<http://advancedagsys.com/january-2014-better-new-seedings/>

Sincerely,

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to Better  
Agriculture**

