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Comments, suggestions, and articles will be much appreciated and should be submitted at your earliest convenience or at least two weeks before the following dates: February 28, May 30, August 30, and November 30. The editor would like to acknowledge the kindness of Mr. Todd White who has granted us permission to use his scenic photographs seen on the front cover page. Please go to www.scenicbuckscounty.com to view more photographs.

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Foliar Fungicides on Wheat

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Wheat is susceptible to a number diseases in the Mid-Atlantic region, including foliar diseases such as powdery mildew, Stagonospora leaf blotch, tan spot, and leaf rust, and diseases of the seed head, including glume blotch and Fusarium head blight (scab). Resistance to these diseases differs in many wheat varieties, and the first line of defense should be proper selection of varieties that are adapted to the area and have good disease resistance. Fungicides are also used to help manage these diseases, and several products have been labeled over the past decade or so to help control or at least reduce the severity of them.

Modern fungicides commonly used in small grains today fall into two main categories: strobilurins and triazoles. These products differ in chemistry, mode of action, and ability to affect disease development after infection occurs. The strobilurins, which include azoxystrobin (Quadris), pyraclostrobin (Headline), and trifloxystrobin (Flint-not currently labeled for wheat), are primarily preventative-type fungicides and must be applied prior to infection of plant tissues for maximum effect. Triazoles, which include propiconazole (Propimax, Tilt, and several other products), tebuconazole (Folicur and others), and prothioconazole (Proline), have both preventative and curative activity, although for best results it is recommended that these products be used preventatively. Some products are premixes of both chemistries. Examples include Quilt (azoxystrobin plus propiconazole) and Stratego (trifloxystrobin plus propiconazole).

Research has shown that strobilurin fungicides can have positive “plant health” effects that are unrelated to disease control, and can provide yield gains in the absence of disease. Evidence indicates that strobilurins can improve nitrogen efficiency in plants and improve plant response to stress. However, yield gains have been inconsistent and it is difficult to predict under what conditions yield will be improved.

With recent high wheat prices, there is again interest in more wheat production inputs, including fungicides. Normal fungicide use patterns have had the objective to protect the flag leaf. However, farmers have wondered if fungicides can be effective if applied at green-up in early spring, possibly tank mixed with nitrogen and/or herbicides. We applied several fungicides either at green-up (growth stage 5) or at flag leaf (growth stage 10.1), or sequential treatments at both timings.

Methods

A replicated, small-plot trial was conducted at the Penn State Southeast Research and Extension Center near Landisville, Lancaster County. 'Cooper' wheat was planted no-till into corn stubble (corn for grain) on October 13, 2007. Maintenance treatments included Harmony Extra at 0.5 oz/acre applied on April 8, 2008, and 80 lb N/acre as 30% UAN applied the same day in separate applications. Green-up fungicides (Table 1) were also applied on April 8 to 10 x 30-foot plots, arranged in a randomized complete block design with four replications. Flag-leaf stage fungicide treatments were applied on May 14. All fungicides were applied with a backpack sprayer at 15 gallons of water per acre and contained non-ionic surfactant at 0.25% v/v. Plots were harvested on July 12.

In addition, two large-plot, non-replicated trials were run in farmers fields in Lebanon and Dauphin Counties in central PA using grower equipment. At the Lebanon County site, 'Growmark 611' wheat was planted no-till into corn silage ground on October 30, 2007, near Lickdale, PA. Fungicides (Table 2) were sprayed either at green-up on April 8, 2008 or at flag-leaf stage on May 29. Each plot was approximately 2 acres in size, and were harvested on July 10 and yields determined with a calibrated yield monitor. In Dauphin County, 'Pioneer 25R54' wheat was planted into disked corn stubble on October 2, 2007, near Berrysburg, PA. Early (green-up) sprays were done on April 8, 2008, and late (flag leaf) sprays were done on May 14. The plots were harvested on July 9 and yields determined with a yield monitor.

Results

Disease pressure in the plot area was extremely low, even in the untreated plots. The wheat stand at Landisville was less than ideal, and it is possible that the more open canopy allowed better air movement and leaf surface drying than would occur in an optimum stand, reducing disease development. In addition, June was very dry (1.75 total inches of rainfall), which may have limited disease development. Very low amounts of powdery mildew were observed in the field, but not enough for consistent ratings. No Fusarium head blight was observed.

There were no significant differences in yield from any of the treatments. The control (no fungicide) treatment yielded 69.8 bu/acre (Table 1). Fungicide treatments resulted in yields of 69.4 to 80.9 bu/acre, with most treatments in the 70-75 bu/acre range. Yields were not affected by the type of fungicide or the application timing. There was also no evidence of plant health effects of the fungicides. However, it is known that these effects are not consistent.

The large plots in Lebanon and Dauphin Counties were unreplicated, so no statistical comparisons are possible. At both sites, green-up and flag leaf treatments had little or only slight effect on wheat yield (Table 2). However, yields were 10-12 bu/acre higher when a sequential application was done (green-up followed by flag leaf). There were no observations of disease pressure.

Conclusions

The Landisville data show little advantage to fungicides applied to wheat. However, June of 2008 was very dry and disease pressure was low. Rain in June was 1.75 inches, with most occurring on June 4. This lack of rainfall may have reduced disease pressure. In a year with high disease presence and on susceptible varieties, fungicides can be very important to help protect yield. Farmers should monitor expected weather conditions carefully to determine the most effective fungicide timings.

Table 1. Effect of fungicide and timing on wheat yield at the Penn State Southeast Research and Extension Center in 2008.

			Yield (bu/a)		
Product	Rate @ green-up	Rate @ flag leaf	Applied at green-up	Applied at flag leaf	Applied at both timings
Untreated	--	--		---------------------- 69.8 ----------------------	
Headline	3 oz/a	6 oz/a	72.5	72.7	71.5
Tilt	2 oz/a	4 oz/a	75.1	75.6	69.4
Quilt	7 oz/a	14 oz/a	70.1	73.4	72.3
Stratego	5 oz/a	10 oz/a	70.5	71.4	75.5
Kocide 3000	0.75 lb	--	80.9	--	--
Tilt fb Quilt	2 oz/a	14 oz/a	--	--	73.7
LSD (0.05)				---------------------- NS[1] ----------------------	

[1]LSD to compare any number on the table (p=0.5426).

Table 2. Effect of fungicide and timing on wheat yield on grower farms in Lebanon and Dauphin Counties in 2008.

			Yield (bu/a)	
Product	Rate @ green-up	Rate @ flag leaf	Lebanon	Dauphin
Untreated	--	--	70	73
Kocide 3000	0.375 lb/a	--	74	--
Stratego	6 oz/a	--	--	89
Headline	4 oz/a	--	70	--
Quilt	--	10 oz/a	76	85
Headline fb Quilt	4 oz/a	10 oz/a	82	--
Stratego fb Quilt	6 oz/a	10 oz/a	--	93

Cereal Rye Cover Crop and Dairy Farms
A Match That Makes $ense

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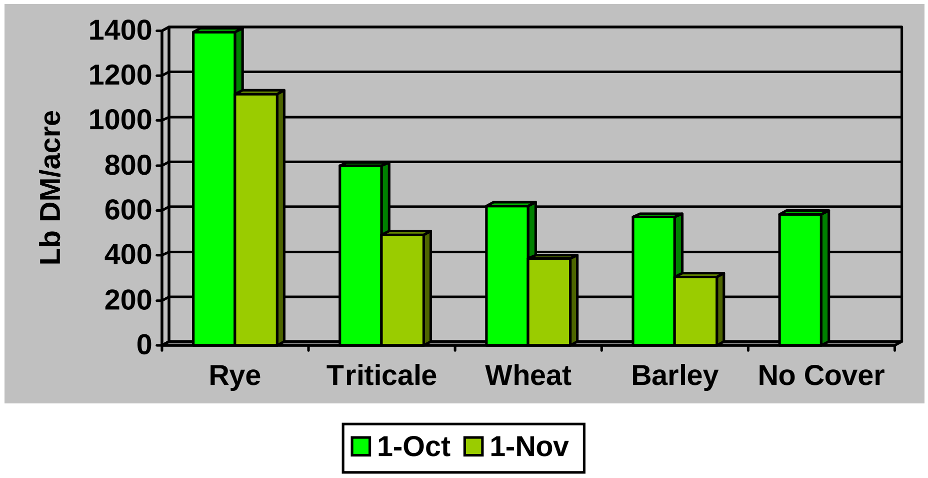
Fall is again upon us which means it is time to plant cereal cover crops. If you operate a dairy farm, planting a cereal cover crop in the fall is an opportunity to utilize residual nutrients that remain after corn silage harvest, and convert those nutrients into additional dairy forage. If you reside in Maryland and are participating in that state's Cover Crop Program, planting cereal rye, considered the best cereal cover crop, prior to October 1 can net you as much as $85/acre if you reside in a priority watershed and if you seed the crop with either a drill or some other tillage implement that produces good seed/soil contact. By doing so, you are not only producing additional forage for your dairy but you are also taking advantage of a number of cover crop benefits.

- ✓ Soil conservation.
  - A cereal cover crop reduces soil erosion especially on land with erodible slopes.
  - The earlier the cereal cover crop is planted the better it performs this ability.

- ✓ Nitrogen conservation.
  - A cereal cover crop consumes residual soil nitrogen reducing its loss potential to leaching.
  - A cereal cover crop that is harvested for forage recycles a portion of those nutrients back to the farm when manure is applied to the fields.
  - A cereal cover crop not harvested for forage will recycle the nutrients and make them available for future crops when its residue is mineralized.

- ✓ Dairy forage production.
  - A cereal cover crop can be harvested the following spring providing additional forage for the farm.
  - A rye cover crop, considered the best cereal species to use for cover crop purposes, that is used for this purpose should be harvested during the early boot stage of development to maximize dairy forage quality.
  - When harvested at this stage, a rye cover crop will have consumed more of the residual soil nutrients from the previous crop than other cereals, and it will have produced more forage biomass than any of the other cereals (Figure 1).
  - A late planted rye cover crop produces more silage biomass than other cereals that are planted early (Figure 1).

Figure 1. Rye silage production (dry matter basis and averaged over 3 years) for a mid-April harvest date for four fall seeded cereal cover crops planted on two dates in Maryland.



- ✓ Fall and spring manure utilization.
  - In Maryland, fields where cereal cover crops will be planted are eligible to receive up to the equivalent of 40 lb N/acre manure in the fall if the field's nutrient management plan allows for an N based application rate. And, if the field's nutrient management plan calls for a P-based application rate, the manure application rate must be adjusted accordingly.
  - A cereal rye cover crop planted early (~ October 1) provides a fast emerging and a rapidly growing crop that has been shown via research to consume by the following spring approximately half of the plant available nitrogen that was in the manure when it was applied.
  - Cereal rye cover crop fields that are harvested for forage provide a site for another manure application in the spring as long as the application is done in compliance with the field's nutrient management plan for the next crop. For many dairy operations, these fields will be planted to corn for silage production.
  - Farmers who do apply manure to a field after a rye cover crop has been harvested for silage should either inject the manure into the soil or till the field after the application to maintain as much of the nitrogen as possible rather than allowing it to be lost to the atmosphere as ammonia.

The use of a cereal rye cover crop will allow dairy farmers to efficiently utilize crop nutrients that have been produced on the farm. Given today's high cost of crop nutrients (N, P, and K), it has become essential for dairy farmers to do so. And, in the process, diary farmers can produce additional forage for their operations. A cereal rye cover crop grown on a dairy farm just makes ene.

Timed Artificial Insemination Programs, Economic Considerations and Dairy Profitability

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Introduction

The reproductive benefits of timed artificial insemination (**TAI**) programs are generated because these programs achieve a 100% rate of submission of cows for service. That is to say, TAI programs move the efficiency of estrus detection from an average of 45-50% in breeding programs practicing estrus observation to 100% in the TAI program. In so doing, TAI programs automatically reduce days open, the numbers of cows culled for infertility and increase the number of pregnancies within a brief time frame. The number of pregancies is much greater than the number in programs based on estrus observation. Timed AI programs also result in reduced veterinary costs from fewer cows classified as infertile, anestrous or weak estrus. Workload also benefits from decreased time spent on detection of estrus, cow selection and organization. Comparing reproductive performance in management schemes based on TAI verses estrus detection by observation, Tenehagen et al. (2004) showed TAI programs resulted in cows being bred an average 16 days sooner than cows inseminated by estrus detection. AI submission rates after the VWP in the first 21 days after the end of the VWP was higher in the TAI program (82%) than the program based on heat detection (39.4%). First service conception rates were higher in animals observed to be in estrus (45.1%) compared to TAI animals (34.5%) but conception rates did not differ across all services between programs. Days open were lower and percent cows pregnant was higher in the TAI program. As a result of all these events, TAI programs improve cash flow and profitability even though there is an initial monetary outlay for hormones, labor and semen.

The goal of dairy management is to maximize the profitability of each cow. It is easy to understand that maximum cash return per cow is realized during periods of highest milk production while lowest cash flow occurs in pre-partum heifers and dry cows. Because of the difference in yield between first lactation and second lactation animals, it also makes economic sense to move cows into the second lactation is soon as possible by maximizing reproductive efficiency in first lactation cows. Moreover, due to the shape of the lactation curve, cash returns diminish with longer days in milk because milk yield tails off in later lactation. The rate that production and cash return falls off for each cow will depend on each individual level of lactation persistency. Income over feed cost approximates 3:1 in early lactation but drops to 1:1 in late lactation. As a result, income over feed costs also diminishes with longer days in milk (higher days open (**DO**), longer calving intervals) because yields drop later in lactation. Greater days in milk mean lower yields and therefore lower returns. Greater reproductive efficiency maximizes returns over feed costs because cows spend much greater percent of their productive lifetime in early lactation. Models by Meadows et al (2005) indicate producers should strive to achieve less than 110 DO (12.9-13 month calving interval (**CI**)) as this maximizes average daily milk yields. Lower reproduction efficiency generated by low estrus detection efficiencies and/or low conception rates will lead to reduced daily milk production per cow. Decreased daily productivity translates into diminished lifetime productivity and therefore lifetime profitability. Lower reproductive function also increases involuntary culls for infertility while narrowing the availability of replacement stock pools.

Maximizing total farm profits is an important objective for commercial dairymen. Since most cows are culled for low production, reproductive failure, mastitis and lameness, breeding and replacement decisions are critical elements of management policy. Replacement policy based upon sound, informed decisions greatly influences the profitability of modern dairy herds. Optimizing reproductive and replacement decisions therefore helps maximize farm profitability. In a recently developed economic model of breeding and replacement decisions, Groenendaal et al (2004) developed a decision making tool that ranked cows using an economic index that determines individual future profitability relative to all other herd mates. The index shows cows with high production naturally have higher value for any given level of reproductive efficiency. Cows with production potential far below the herd average can become so unprofitable that culling is really the only viable economic option even if the cow was able or even became pregnant. In late lactation, it would be more profitable to cull such a cow and replace her with a heifer with higher potential for milk production even though the particular cow was pregnant. According to the model, future profitability of any cow is highest just before calving, drops of with increasing DIM and then increases again because of impending expected income from milk production during the next lactation. This profile of profitability occurs across cows at any given level of reproductive efficiency (e.g. pregnancy rate). This profile of profitability points to the economic advantage of high pregnancy rates and low days open (DO). Improved reproductive efficiency had the one small draw back in that Groenendall's model showed individual cow profitability tended to fall off with advancing lactation number. Of course, the higher the reproductive efficiency in a cow the faster she will move toward the later lactation. Lastly, the relative individual future profitability of a low producing cow (for example, 24% below herd average) may fall low enough that culling is the only economically viable option later in lactation (6-7 months) even if the cow becomes pregnant. Clearly, it can make the most economic sense to replace this type of cow if a replacement heifer with higher potential milk production and therefore future profitability is available. No economic advantage would be realized by accruing further expenditures in an attempt to keep that particular animal in the herd while correcting health or reproductive problems. Replacement decisions are made because there is no additional profit to be realized by keeping a cow around when a more profitable replacement option is available. The real issue, given one reproductive goal of management should be to keep cows in early lactation is to decide which cows should be bred and why TAI?

Profitability or economic returns for improving reproductive efficiency measured as pregnancy rate are not linear and constant across all herds. Like anything else, the law of diminishing returns also applies to reproductive efficiency. Producers in herds with lower pregnancy rates (10-15%) will experience greater returns on investment per unit increase in pregnancy rate ($40.00 per unit increase). Producers with relatively higher pregnancy rates (18-22%) will see less return per unit increase in pregnancy rate ($12.00 per unit increase). Producers with relatively high pregnancy rates (26-32%) will experience even less return ($3.00per unit increase) in pregnancy rate improvement. Thus, the immediate and most obvious economic benefit from TAI is most pronounced in farms with low estrus detection rates. On farms with acceptable estrus detection rates, TAI may still be of benefit but the returns on investment may not be as large even if the program increases reproductive efficiency (Tim Overton, 2008). However, the return for improvements in pregnancy rates increase with increasing level of herd production. Thus, improving pregnancy rate from 15 to 20% in herds with 20,000 lb ME production may return $16.00 per unit improvement while in higher producing herds the return may be as high as $22.00 per unit improvement in pregnancy rate (Tim Overton, 2008).

Total Costs per Pregnancy and the Value of Pregnancy

Cost of TAI are generated from costs of drugs, treatments and the AI necessary to achieve the desired pregnancy rates. Costs arise from GnRH, PGF, semen, injections, rectal examination, and days open and culling. The first four tend to be higher in TAI programs while the last three tend to be higher in estrus detection programs. Culling, costs for days open, and replacement costs tend to be higher in the estrus detection programs. Overall, the costs are variable by herd as the costs per pregnancy may be lower in some herd with programs of estrus observation while higher in other herds with estrus observation programs. Higher costs per pregnancy in programs of estrus observation arise from higher culling losses and greater days open among cows not culled. Costs for drugs, treatments, and AI are higher in TAI programs. However, TAI has proven to be economically superior in most if not all herds even though herds with higher estrus detection rates may not experience as high economic benefits with TAI as herds with lower estrus detection rates. The reason is simple: TAI programs only improve reproductive efficiency by moving estrus detection rates to 100%. In addition, economic benefits may not be as high with TAI programs in herds with higher EED early after pregnancy diagnosis. EED is a necessary component of all breeding programs but can become a real problem in TAI programs implemented in the face of poorer body condition scores (BCS).

The value of a pregnancy is difficult to determine but is clearly influenced by estrus detection rate and conception rate. Lower conception rate and/or estrus detection efficiency increase the value of pregnancy and are the two factors producers can change with good nutritional and reproductive management practices. Estimated values of pregnancy includes input costs of days open, net cost of reproductive cull replacement (value of replacement stock–slaughter value of reproductive cull) and the cost of breeding the open cow. Of course, each of these inputs can be widely variable. Costs of days open can be affected by changes in the two factors determining pregnancy rate: estrus detection efficiency and conception rate (Stevenson, 2001). The value of a pregnancy in herds with conception rates of 40% (2.5 services per conception), estrus detection rates of 70% and therefore pregnancy rates of 28% (.40 X .70), insemination costs of $20 per breeding, a cost of $1.00 per DO, cull salvage values of $500, replacement costs of $1,200 and 20% of the open cows fail to conceive. At this pregnancy rate (28%), a cow would require 3 estrus cycles or 63 DO to become pregnant. The total cost of days open would be $63 at $1 per DO. That is to say the value of the pregnant cow is $63 greater than the open cow. With a 40% conception rate, each cow that became pregnant would require 2.5 services per conception costing approximately $50 per cow per pregnancy. The cost of replacing each cow in the 20% of open cows that failed to conceive would be $140 [0.20 x (1200-500)] per cow. Therefore, each pregnancy would be valued at $253 (63 + 140 + 50). Producers may ask when you would realistically ever achieve a 70% estrus detection rate. The answer is rarely in most estrus observation programs. In the example, Stevenson actually reset the estrus detection rate to 50% which is more closely representative of commercial breeding programs based on estrus observation. Under these conditions, the pregnancy rate drops to 20% assuming the same 40% conception rate (.50 x .40). At this lower pregnancy rate, it would require at least 4 estrus cycles to achieve 80% pregnancy in the open cows. Accordingly, the cost of 84 days open (at $1 per day) is increased to $84 instead of $63. The recalculated value of a pregnancy moves to $274 ($84 + $50 + $140) at this more realistic but lower efficiency of estrus detection (50%) and pregnancy rate (20%). In the example, Stephenson assumed insemination costs, replacement cost ($1,200), and salvage prices for culled infertile cows ($500) remained unchanged. Thus, a simple change in estrus detection efficiency from 70% to 50% increases the costs of days open and erodes the value of the open cow relative to the pregnant cow. The principal value of TAI programs is they shorten days to first service and move estrus detection efficiency to 100%. There may be some therapeutic advantage of the hormone programs in anestrous and anovulatory cows but producers need to recognize the major benefit of TAI programs is presentation of 100% of cows for insemination. Even though these programs increase expenditures on pregnancy (e.g. hormone and labor costs), these direct costs are clearly offset by increased number of pregnancies with lower DO. Returns to producers will vary because of differences in the value of a pregnancy and DO across different operations.

Stephenson's (2001) estimated value of a pregnancy is close to the average value of a new pregnancy estimated by Devries et al. (2006). However, the actual value of a pregnancy varies between cows and is dependent on factors like individual cow production performance, herd production performance, stage of lactation, lactation number, stage of gestation, breeding, and replacement decisions. The value and therefore culling decision about a cow is dependent upon familiar factors such a milk yield, lactation number, month in lactation, reproductive status, and month of gestation. Clearly, the greater economic value of two cows with the same production, lactation and stage of lactation status excepting one is pregnant and the other is not pregnant is derived from the pregnancy and month of gestation (Devries et al. 2006). Given a culling decision must be made on the two cows, the value of the pregnancy in one cow in many but not all cases would tend to favor retention in the herd whereas the other non-pregnant cow might be culled particularly if the two cows are aged, late in lactation and showing low daily milk yields. The value of the pregnancy is the difference between the value of the open cow and the value of the pregnant cow. It is easy to understand the value of a non-pregnant cow will deteriorate over lactation until at some point in lactation she is no longer profitable and therefore culled. In contrast, the value of the pregnant cow could in most cases be expected to increase over the same lactation because the increasing length of gestation places her closer to calving, a new lactation and an offspring that increases in value with lengthening gestation. Thus, the values of these two cows diverge with increasing stage of lactation because one value increases while the other deteriorates over time.

Devries (2006) showed the *value of a new pregnancy* could be an important determinant directing producer decisions on which cows should receive and will return the most profit for economic resources invested to achieve a pregnancy. The model indicated the value of new pregnancy tended to be greatest in cows closer to culling, with higher replacement costs and/or with lower persistency of production. Both stage of lactation and level of milk production were important factors in determining the value of a new pregnancy. A *new pregnancy* tended to be lower in value when it occurs in early and late lactation and highest in mid-lactation. Indeed, the value of pregnancy can actually become negative early in lactation in cows with higher than average production and high persistency of production. The negative value of a pregnancy means breeding should be delayed beyond the voluntary wait period. In these cases extending DO by 30 days in heavy lactating cows would not be unusual or unprofitable. The lower pregnancy value late in lactation arises because cows that become pregnant after an extended number of DO tend to be culled and replaced by replacements showing higher production. The value of a new pregnancy was also higher in cows with average or higher than average production across all lactations. In contrast, the value of a new pregnancy was lowest in cows with below average production. Persistency of production across all lactations also impacted the value of a new pregnancy because the greater the level of production persistence, the lower the value of a new pregnancy. New pregnancies occurring early in the lactation (producing low DO) of a heavily producing cows having high lactation persistence will have a much more negative effect on milk yield than new pregnancies occurring late in lactation of cows with low production and low persistence of lactation. Thus, the value of a new pregnancy can actually approach $0 in lower producing cows a year or more in production (13 months) because the best economic decision for both cows with a new pregnancy at 13 months is the same as a similar cow that is not pregnant; both should be culled. In these cases, the value of the new pregnancy simply does not add to the value of the cow with prolonged days in milk. Better understanding of the value of pregnancy for individual animals should help direct decisions upon which groups of non-pregnant cows producers would realize the greatest economic return for achieving pregnancy. Generally speaking, producers in herd with higher DO (>110-120) stand to gain larger returns for dollars allocated toward in labor, drugs and time to improve reproductive efficiency than producers with lower DO (<110). However, not every cow eligible for insemination need enter a TAI program. Deciding if or when to invest time and economic resources into breeding individual cows should be made while considering the number of DO and stage of lactation, lactation number, relative level of milk production, and even the history of individual lactation persistency prior to being considered eligible for breeding as each of these impact the value of pregnancy.

<u>Days Open and Costs of Days Open (DO)</u>

One of the most useful reproductive indices is days open (DO) because prolonged DO reduces income by reducing milk production and the availability of herd replacements. Lengthened voluntary wait periods, inefficient estrus detection, lower conception rates, and increased early embryonic death rates are all reflected in lengthening DO. Consequently, economists and modelers have attempted to estimate the economic value on a DO. Optimal CI for maximizing milk yields ranges between 12-13 months (< 110 DO). How does one assign the costs of extra days open? Estimates of the costs of days open vary tremendously across studies but generally run in the area of $2 - $3 per extra DO. The value of days open is also not constant but increases with increasing days open. For example, the costs of DO at 110 DO have been estimated by Overton (2008) at $0.10 whereas at 250 days open, the cost was estimated to be as high as $4.37 per day. The estimated cost of an extra day open is actually dependent upon what conditions actually exist in a given herd. Several important factors in a herd have been shown to impact the cost of extra days. They are the availability of replacement heifers with greater potential profitability than the cow in question, the milk production level of the cow in question, reproductive efficiency of the cow in question relative to the herd, lactation number of the cow in question and overall culling rate practiced in the herd. Economic models show there is a steady, almost linear increase in the cost of DO as DO progress from 2 months (CI=11 months) to 8 months (CI = 17 months) whether heifers are or are not available to replace the less profitable dairy cow in question. However, the costs of extra DO are higher at times when replacement heifers are available than when replacements are unavailable. Thus, the opportunity to replace the cow in question with a potentially more profitable replacement increases the costs of extra DO over the costs when replacements are not available. In addition, the costs per DO are higher for lower producing cows than higher producing cows. That is to say a longer CI does not decrease profitability as much for high producing cows as it would for the lower producing cows. In fact, if individual production is sufficiently low compared to the herd average (models predict approximately 76% of herd average) the cow may become so unprofitable that breeding any time in lactation may be economically unjustified because replacement with a potentially more profitable replacement animal would be the only viable economic decision. Costs of extra days open also increase with increasing lactation number. Costs of DO in first lactation heifers are lower and increase more slowly through lactation because of the longer persistency in milk production on first verses second and later lactation animals.

Models developed by Meadows et. al. (2005) suggested profitability drops off significantly as annual culling rate moves from 30%-35%-40% of the herd at any number of DO. Of course, profitability decreased with lengthening DO at any level of culling. Greater profitability is realized with lower herd turnover and shortened DO but culling to simply reduce DO and calving intervals may not always be the most profitable management scheme. Herds can be profitable with higher than desirable DO but lower rates of culling when the costs of culling (at higher cull rates) may exceed economic gains generated by the lower DO.

Meadows model (2005) also predicted lifetime production of calf crop and the all important replacement heifer pool becomes a critical factor at high DO. At an average cull rate of 34% and age at first calving of 26.6 months, most cows can not contribute to the pool of replacement heifers when DO extended beyond 145. Therefore, production of calves diminished with extended DO and became an undependable source of replacements heifers after 145 DO. The reason is simply that 15 month calving intervals reduce calving frequency to levels that cannot sustain a sizable replacement pool.

Changes in feed costs and milk price obviously impact profitability but the effect is not constant over DO. Indeed, the marginal cost of DO is nonlinear and increases with increasing DO. Marginal costs for low DO (12.5 month CI) in the model were similar at 3 different levels of feed costs and milk price. However, costs per DO became much greater at higher DO (14month CI) at higher feed and milk prices compared to conditions with lower milk and feed prices. At the 14 month calving interval, higher milk and feed prices reduced profitability to a much greater extent than lower feed and milk prices.

Most of these issues provide compelling reasons to implement TAI programs on most commercial dairies. Perhaps the greater problem is to incorporate each of these issues into the decision on when a cow should enter a TAI program or more importantly when she should no longer be considered a candidate for TAI.

Economic Considerations of TAI Programs and Body Condition Scores (BCS)

Cows with too low or too high BCS at parturition have poorer reproductive function due to delay in onset of first estrus post partum, decreased conception rates at first service post partum, increased EED post conception and increased anovulatory estrus post partum. Although many producers attribute heavy production as the causal event triggering these problems, the real culprit is negative energy balance and loss of body condition. Cows losing more than 0.5-0.75 BCS during early lactation will develop many of these problems. Low BCS cows (BCS < 2.5) will become very costly as they accumulate extra days open as long as 120 days post partum compared to cows with normal BCS (BCS > 2.5). Pregnancies simply occur much later in lactation (greater DIM) in low BCS cows compared to normal BCS cows. In herds using TAI programs to achieve insemination shortly after the VMP (45-60DIM), BCS is positively correlated with pregnancy rate. For each unit increase in BCS, these herd experienced a 13% increase in pregnancy rate suggesting estrus was stronger, produced ovulatory follicles and improved conception rates in cattle with increasing BCS (Moreira et al., 2000). Profitability per cow per year increased as percentage cows with low BCS decreased in herds using TAI. Net revenues per cow per year increase 53-54 fold as percentage of cows with normal BCS at TAI move from 0 to 100%. Economic modeling suggests the average commercial dairy can increase net revenues per cow per year up to $10-11.00 per cow by reducing the frequency of cows in low BCS at approximately 63 days post partum from 30 to 10%. The increase in revenue is entirely due to increase in pregnancy rates to first service.

Summary

The relationship between reproductive efficiency and profitability on commercial dairies is clear. Efficient reproductive performance places cattle in the early period of lactation more often where the greatest return over feed costs is realized. TAI programs provide a management tool to maximize profitability by significantly improving estrus detection rates. In so doing, pregnancy rates increase while DO, calving interval and number of involuntary culls from reproductive failure fall off. Economic returns from TAI are impacted by many factors including cost and availability of herd replacements, milk yield, and lactation number, stage of lactation, persistency of lactation, DO when pregnancy is achieved and level of estrus detection realized through observation. When or even if an individual cow is submitted to TAI is largely dependent upon the value of each pregnancy. Pregnancy can have little to no value in low producing cattle with extended DO in late lactation. Investing economic resources under these conditions may not yield sufficient return to make insemination a viable economic choice. Pregnancy may also be of little value early in the lactation of heavy producing cattle showing high persistency. In these cases, delaying insemination a bit may be the most profitable economic decision. The greatest benefits of TAI on reproductive efficiency are realized only when producers manage rations and nutrition programs that sustain high energy and dry matter intake to avoid excessive loss of body condition. Nutrition programs that fail to prevent BCS losses greater than 0.75 BCS will diminish the economic returns of TAI by eroding conception rates.

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Fertilizers: Fall 2008

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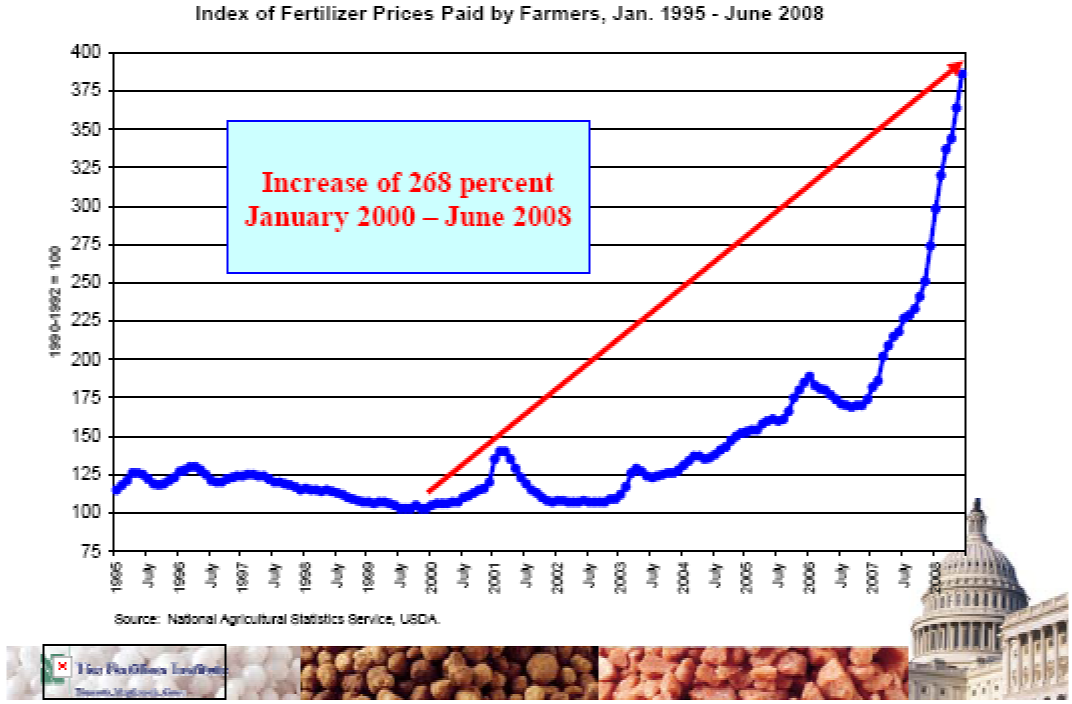
Fertilizer prices have increased dramatically in the past two years, and especially since 2001. Dr. Harry Vroomen with the Fertilizer Institute in Washington, DC summarized USDA data on the index of fertilizer prices paid by farmers from January 1995 through June 2008 (Figure 1). The increase from January 2000 to June 2008 has been 268%. While this is a dramatic increase, prices during the past year for N, P and K fertilizers have increased 2 fold for N as urea, 2.75 fold for P as diammonium phosphate, and 3.5 fold for granular muriate of potash (Green Markets, vol. 32, Sept. 1, 2008). Urea ammonium nitrate solution (30% N) has increased almost 2 fold. These prices are being supported by high grain prices and world demand for increased grain production that requires more acres.

Figure 1



Source: Dr. Harry Vroomen, The Fertilizer Institute, Washington, D.C

Many growers are concerned about these high prices, as are our retail dealers. While high grain prices support these fertilizer price levels on both US and world levels, there is justifiable concern by livestock producers about the risk associated with the cost of fertilization of hay and pastures in today's market. However, we know that high yields are required for profitable production due to fixed costs, and that sustainable production requires the replacement of nutrients that are removed in harvested crop yields. In all phases of agriculture, the optimization of nutrient use is more critical today than I have ever seen.

The foundation of profitable, sustainable, environmentally sensitive crop production is based on fundamental agronomic principles. The principles involve determining soil productivity, soil testing for pH and available nutrients, applying needed nutrients with optimum placement and timing, selection of the best available varieties, and planting at the optimum time, rate, and depth. All of these factors combine to build a high yield potential for each field and crop.

Soil testing is the essential first step in optimizing nutrient use. High quality soil samples should be taken as soon as possible for fall 2008 and spring 2009 applications. Rain is expected over most of Virginia this coming weekend and should improve soil sampling conditions compared to recent weeks. Samples should be taken at the proper depth with as many cores as possible being taken per field or management zone (more information at www.soiltest.vt.edu/soiltest.html). Management zones should be established according to major soil differences (http://websoilsurvey.nrcs.usda.gov/app/), previous crops, and previous management. Fields that have not been split in the past for sampling may warrant separate samples this year due to the cost of nutrients. These data should be carefully studied to determine how rates can be varied between and within fields as the value of nutrients is such that applying different rates may be more economical than in past years. High and very high soil test calibrations mean that little to no yield response can be expected from the addition of the nutrient. If the soil test is in the high, and certainly the very high range, funds should be used to provide other nutrients to fields, or other areas of the field, that test low or medium in plant available nutrients. Also, soil pH should be optimized by applying needed lime as far in advance of planting as possible to optimize the availability of nutrients and use of applied fertilizers.

Costs associated with over-fertilizing are greater than ever due to the value of nutrients, but also the cost of under-fertilizing grain and high value hay is greater than ever due to the value of these crops. Developing the fertilizer program for fall 2008 and spring 2009 begins now with soil sampling and analysis of the data. Also, growers need to be talking to their fertilizer suppliers to determine costs and availability of materials to have the needed products available at the optimum time.

Getting Legumes into Your Pastures

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One good thing about drought is that it provides us with an opportunity to get legumes back into our pastures. Sods have been grazed close, in some cases really close and while this may not be ideal pasture management, it is ideal for pasture renovation. Close and frequent grazing reduces the competitiveness of sods and the amount of residue on the soil surface, both of which are essential for successfully frost seeding or no-tilling legumes. The following steps will help to ensure successful renovation:

- *Control Broadleaf Weeds*. Broadleaf weeds must be controlled prior to seeding legumes. This is best accomplished by controlling weeds the season prior to renovation.

- *Soil Test and Adjust Fertility*. In order for pasture renovation to be successful proper soil fertility is required. Lime and fertilize pastures according to soil test results. Lime should be applied six months prior to renovation if possible.

- *Suppress Sod and Decrease Residue*. The existing sod must be suppressed and plant residue reduced prior to seeding. The reduction in plat residue facilitates good soil-seed contact. This can be accomplished by hard grazing in late fall and early winter or by using herbicides.

- *Ensure Good Soil-Seed Contact*. Regardless of what seeding method is chosen, good soil-seed contact is required for seed germination and emergence.

- *Seed on Proper Date*. Frost seeding or drilling legumes back into pastures is usually best accomplished in late winter. Frost seeding is accomplished by simply broadcasting the seed on the soil surface and allowing the freezing and thawing cycles to incorporate the seed into the soil. Success with frost seeding can be enhanced by dragging your pasture after or as you broadcast the seed. This simply gets the seed in better contact with the soil. <u>*Prior planning and preparation are important so that seeding can be done in a timely manner*</u>.

- *Use High-Quality Seed of an Adapted Species*. Choose forage species that are adapted to the area and end use. Use either certified or proprietary seed to ensure high germination, seed genetics, and low noxious weed content. Cheap, low quality seed often cost more in the end due to lower production and thin stands. In Virginia, a good mixture for renovating pastures with is 4-6 lb red clover, 1-2 lbs of ladino or grazing white clover, and 10-15 lb of annual lespedeza per acre.

- *Use correct seeding rate.* Calibrate your seeder prior to planting. Seeding at too high of a rate needlessly results in higher seed costs. On the other hand seeding at too low a rate results in weak stands and lower productivity.

- *Inoculate Legume Seed*. Always use inoculated legume seed or inoculate it with the proper strain of nitrogen fixing bacteria prior to seeding. This is relatively inexpensive insurance that legume roots will be well nodualted and efficient nitrogen fixation will take place.

- *Control Seeding Depth*. Small seeded forages should never be placed deeper than ½ inch. When using a drill always check seeding depth since it will vary with seedbed condition and soil moisture status. <u>*Placing small seeded forages too deep will results in stand failures*</u>.

- *Check seed distribution pattern. When using a spinner type spreader/seeder, make sure and check you spreading pattern. In many cases, small seeded forages are not thrown as far as fertilizer. This can result is strips of clover in your pastures rather than a uniform stand. Also, check your seed distribution pattern. Single disk spinners often throw more seed to one side.*

- *Control Post-Seeding Competition*. Failure to control post-seeding competition is one of the most common causes of stand failures. Clip or graze the existing vegetation to a height just above the developing seedlings. This must be done in a timely manner to ensure that the competing vegetation does not get ahead of the seedlings.

Building Stronger Nutrient Cycles in Virginia's Pastures: Managing for Legumes

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The cost of nitrogen fertilizer is now more than $1.00 per pound actual nitrogen as urea. That is a four to five-fold increase in the past 5 years. The cost of potash and phosphorus have also increased drastically, but they are still a better buy than nitrogen since their effects are longer lasting compared to the relatively short effect of nitrogen fertilizer. It is important to remember grazing animals remove relatively small quantities of potash and phosphorus, 5 lb phosphate and 0.7 lb potash per acre per year. Once we have potash and phosphorus built up in our grazing systems, the cost of nitrogen becomes our primary concern. Luckily, we have an alternative to commercial nitrogen fertilizer. That alternative is regaining popularity at a rapid pace.

Legumes fix nitrogen in the air to a plant available form. The importance of legumes in grasslands has long been recognized. They bring N into grassland ecosystems via symbiotic nitrogen fixation, improve forage quality and animal performance, and dilute the toxic effects of the endophyte found in tall fescue. It is estimated that commonly used pasture legumes will fix between 50 and 250 lb nitrogen per acre per year (Table 1). This nitrogen is valued at $35 and $175 per acre per year.

Table 1. The amount and value fixed by commonly used pasture legumes.

Legume	N Fixed	Value of Fixed N ($/A/year)	
	lb/A/yr	N cost=$0.75/lb	N cost=$1.00/lb
Alfalfa	150-250	115-190	150-250
Red Clover	75-200	55-150	75-200
Ladino Clover	75-150	55-115	75-150
Annual Lespedeza	50-150	35-115	50-150

Adapted from *Southern Forages, Fourth Edition*.

Legumes share nitrogen with grass indirectly. Nitrogen is transferred to grass grown in association with legumes through the ingestion of legumes and subsequent deposition of dung and urine by grazing animals, death and decomposition of above and below ground plant parts including roots, shoots, and nodules, and to a lesser extent direct legume to grass transfer. The sharing of nitrogen is limited during the first growing season after establishment.

Overseeding legumes is not the same as applying commercial nitrogen fertilizer. Mixed stands of grasses and legumes may yield as much or more than grass monocultures fertilized with N, but a large proportion of that yield will be made up of the legumes. In other words, legumes compensate for lower grass production.

Applying nitrogen fertilizer to mixed stands sifts botanical composition. The addition of nitrogen fertilizer to grass-legumes mixtures tends to sift the composition of the mixture toward grass. It also reduces nitrogen fixation in the legumes since legumes would rather use nitrogen from the soil if it is available.

Improved legumes require good soil fertility to be productive and persistent. Improved legumes such as red and white clover and alfalfa require relatively high soil fertility and pH's above 6.0 to be productive. This means that an initial investment in potash, phosphorus, and lime must be made. These applications need to be based on a recent soil test.

Legume hay and silage remove large quantities of nutrients. In contrast to grazing, making hay or silage removes large quantities of nutrients. These nutrients must be replaced to maintain soil fertility, and stand health and productivity. Each ton of legume hay that is removed from a field takes with it approximately 15 lb of phosphate and 60 lb potash. In a good year, an alfalfa stand may yield 6 tons per acre and remove 90 lb phosphate and 360 lb of potash.

Legumes are most productive when rotationally stocked. Like other forages legumes respond well to improved grazing management. Resting pastures allows leaf area to regrow and carbohydrate reserves to be stored up. In general, tall growing legumes like alfalfa and red clover are more dependent on stored energy for regrowth. This means that they need time to rest and replenish their stored carbohydrates between grazing events. That is the reason that alfalfa does not persist well in continuous grazing systems. Even white clover that tolerates close grazing very well benefits from rest.

Rotational stocking is a tool to manage botanical composition. How we graze our pastures has a profound impact on botanical composition. In grasses, energy for regrowth is dependent on leaf area remaining after grazing. The remaining leaf area is like a solar panel that captures sunlight and converts it into energy (sugars and carbohydrates) that the plant can use to fuel regrowth. The more leaf area we leave, the larger the solar panel, the faster pastures will regrow, and the more competitive the grass will be the tall growing legumes. If we graze closely with a rest period between grazings, we will tend to favor tall growing legumes in the sward since they are more dependent on stored carbohydrates for regrowth.

Mixed stands can be stockpiled for winter grazing. Grass-legumes mixtures can be stockpiled for winter grazing, but they need to be used first since legumes tend to deteriorate before grasses. Save pure stands of grass that were fertilized with nitrogen for late winter grazing.

Overseeding is needed to introduce and maintain improved legumes. Approximately 25 to 30% of the pasture should be made up of clover or other legumes (See article accompanying article by Ben Tracy). Even improved red clover varieties only last two to three years. Annual lespedeza will sometimes reseed itself, but as a general rule this is not dependable. In the face of nitrogen prices that will likely remain close to $1.00 per lb nitrogen, overseeding smaller quantities of legumes on annual or biannual basis may be a good idea. A good general pastures mix for overseeding pastures in most of Virginia is 4-6 lb red clover, 1-2 lb of ladino or grazing type white clover, and 10 lb of annual lespedeza per acre. At current seed prices, this mixture would cost around $20 to $30 per acre. This cost is the equivalent to applying 20-30 lb of nitrogen per acre.

In today's world where everything is instantaneous, it is important to remember that building stronger nitrogen cycles in your pastures takes time. To bring about measurable change in a grazing system it usually takes at least three grazing seasons. So set your goals, make your changes, and remember good things come to those who are patient.

Harvesting Wet Hay Can Result in Hay Fires

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And

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This spring's rains were a blessing for forage and livestock producers across the Mid-Atlantic Region. While plentiful moisture is great for forage growth, it can be challenging to get that growth cut, cured, and into a bale. In some cases it is tempting to bale hay that is a little too wet. This can result in microbial growth that reduces forage quality and produces heat that can in some cases cause spontaneous combustion. The following guidelines will help you maintain forage quality and reduce the chance of hay fires on your farm:

- Use a hay moisture meter to check hay at baling
- Small rectangular bales should be baled at less than 22 percent moisture
- Large round or rectangular should be baled less than 18 percent moisture
- Use a hay preservative that inhibits microbial growth in moist hay
- Watch for symptoms of heating: slight caramel odor, strong burning odor, visible vapor, strong musty smell, and hay that feels hot to the hands

- Construct and utilize a probe to check the internal temperature of the hay stack

- Watch for the following temperatures:

  - *<130 degrees F* - Monitor temperature twice daily.

  - *130 to 140 degrees F* - Recheck temperature in a few hours.

  - *150 degrees F* – Temperature likely to continue to increase. Move hay to increase air circulation and cooling. Check temperature every two hours.

  - *175 degrees F* – Fire is likely. Call fire department. Allow fire department to move hay since flames may develop when hay comes in contact with the air.

For more information preventing and controlling hay fires see Virginia Cooperative Extension Publication 442-105, Hay Fire Prevention and Control which is available from your local extension office or online at http://www.ext.vt.edu/pubs/bse/442-105/442-105.html.

Managing Pasture Nutrients in Times of High Fertilizer and Hay Costs

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With prices for fertilizer components and hay at or near long-term highs, farm managers on livestock farms will be challenged to manage not only the animals but the pastures as efficiently as possible to minimize nutrient loss and cost. There are a number of principles that the farm manager should be aware of when trying to manage nutrients on their pastures. Although not all encompassing, the following list should help focus farm managers on their pasture's needs.

- Soil test regularly so you will know the nutrient and pH levels in each pasture

- Maintain a soil pH of 6.5 (6.8 to 7.0 if alfalfa is a major component of the pasture) to improve the availability of the macronutrients, especially calcium (Ca), phosphorous (P), magnesium (Mg), and potassium (K)

- Proper pH helps increase pH dependent charge in the soil and thus improves the nutrient holding capacity of the soil and slows potash (K) leaching

- Legumes fix atmospheric nitrogen (N), boost pasture forage protein levels, boost pasture forage yield, and share at least a portion of the captured atmospheric N with the grass component of the soil

- Rotational grazing and especially intensive rotational grazing can improve the distribution of nutrients from manure and urine across the pasture

- When and where feasible, using multiple livestock species can improve forage utilization and help manage nutrient return to the pasture

- In equine operations where the animals choose and define certain defecation areas, frequent collection of the manure can conserve nutrients and prevent runoff (as well as the development of weed patches)

- Properly composting collected manure can help eliminate parasites (from the manure) and provide the manager with a nutrient source

- Legumes help balance Ca:P ratios in forages especially for pregnant animals and rapidly growing juveniles

- Generally frequent small applications of N improve the efficiency of the nutrient by allowing the pasture to take up N before very much is lost through leaching, denitrification, or ammonia volatilization. With high fuel prices that make frequent trips across the pasture expensive, new slow release fertilizer technology although expensive per pound of N could allow less frequent applications, a constant availability of N over a longer period, and improve N use efficiency on pasture

- No-till overseeding of legumes and frost crack legume seedings of small seeded legumes can help boost the legume component in pastures and provide N for pasture growth. The best choices in this region are white or Ladino clover, red clover, and alsike clover (**Do Not use alsike** for horse pastures or where horses may have access to the forage since alsike can cause photosensitive allergic reaction in some horses). Alsike is useful on wet sites for beef production

ASA/DuPont Young Leader Program

Carol Kinsley
Executive Director
Mid-Atlantic Soybean Association

The deadline for the ASA/DuPont Young Leader Program has been extended to Sept. 30. Soybean growers of any age are encouraged to apply for the free, two-part training that will help prepare them for a leadership role in the industry according to Carol Kinsley, executive director of the Mid-Atlantic Soybean Association (MASA). "Apply online at www.soygrowers.com/dyl, or call Michell Siegel at the ASA office, (800) 688-7692, extension 1328, for a copy of the application."

Several farmers from the Mid-Atlantic area have participated in recent years and have gone on to assume leadership roles in MASA or the various state soybean boards which administer the soybean checkoff, including Travis Hastings who recently was named to the Delaware Soybean Board (DSB).

The American Soybean Association (ASA) works with the state soybean associations to choose representatives to participate in the program. Selected candidates will attend Part I of training at Pioneer headquarters in Johnston, Iowa, Dec. 1 through 4, and Part II of training in Grapevine, Texas, Feb. 24 through 28, 2009, in conjunction with the annual Commodity Classic. Applicants must be willing to commit to both sessions.

Chosen candidates must be soybean growers, agree to become members of their state soybean association and be interested in pursuing future leadership roles with their state soybean association or at the national level.

Also fast approaching is the deadline for Conservation Legacy Awards, which offer an expense-paid trip to Grapevine, Texas, for Commodity Classic in February as a regional prize. The Conservation Legacy Awards Program gives the ASA an opportunity to acknowledge good work and showcase management practices that are environmentally friendly, while allowing producers to reap economic returns from their farm. Sponsors are ASA, Monsanto and the Corn and Soybean Digest. For more information or an application form, contact ASA Leadership & Corporate Development Manager Kathy Grunz at (314) 754-1301 or email kgrunz@soy.org. To fill out or download an application online, go to www.soygrowers.com/clap.

Mid-Atlantic Dairy Grazing Conference and Organic Field Day

October 8 & 9, 2008

The Mid Atlantic Dairy Grazing Conference and Organic Field Day will be held October 8-9, 2008 in the Shenandoah Valley of Virginia. The conference will begin at 1PM on Wednesday October 8 with tours of two grazing dairy farms in the vicinity of Dayton, Virginia. Dinner will be served Wednesday evening at the Shenandoah Valley Produce Auction building with a producer panel question and discussion session to end the evening of the first day. The second day of the conference will be held at the Plecker Conference Center on the campus of Blue Ridge Community College in Weyers Cave. The second day begins with registration at 7:45AM and features nationally renown speakers on dairying with little or no grain supplementation, soil fertility, soil health, marketing grass-derived dairy products, and issues regarding unpasteurized milk. The conference will conclude with a capstone address from Joel McNair, editor of 'Graze' magazine and proponent of opportunities for grass-based farming. Complete information on the conference is available on the internet at http://www.wvu.edu/~agexten/upevent.htm or by calling Tom Stanley at 540-245-5750.

Forage-Beef Summit to Address Key Issues Facing Virginia's Livestock Industry

January 12-15, 2009

Virginia Cooperative Extension, the Virginia Forage and Grassland Council, and the Virginia Beef Cattleman's Associations are joining forces to host four educational workshops. The workshops will be held in Reva, Mt. Crawford, Lynchburg, and Wytheville, VA on January 12, 13, 14, 15, respectively.

The keynote speaker is Dr. Harlan Hughes Professor Emeritus and extension livestock economist from North Dakota State University. Many of Virginia's producers know him based on his "Market Advisor" column that appears monthly in BEEF. Dr. Hughes will make two presentations, in the morning, insights into the "Key Issues Changing The Beef Industry" and following lunch a discussion centered on helping Virginia producers understand the importance of "Meeting the Economic Challenges on Our Farm."

The theme of the workshops is "Optimizing Livestock and Forages Efficiencies in Times of Change." Participants will also want to attend to hear other speakers that many Virginia farmers will recognize.

Scott Greiner –Extension Animal Scientist, Virginia Tech will address "Cow Size, Efficiency, and Profit"

Robert Shoemaker - Nutrient Management Specialists, Department to Conservation and Recreation and beef producer will discuss his knowledge and experience in "Managing Stocking Rates for Profitable Beef Production"

Local producer panel – Each panel member will share their strategies for addressing the challenges presented by the markets and weather and the changes they plan.

Chris Teutsch – Forage Research and Extension, Virginia Tech, will help participants understand the science and art of "Building Stronger Nutrient Cycles in Pastures."

Gordon Groover - Extension Economist, Virginia Tech will develop an understanding of the principles of make farm level decision on "Hay vs. Grazing: What are the Costs?"

For more information, contact your local extension office, Virginia Cattleman's Association, or Margaret Kenny at 434-292-5331 or makenny@vt.edu.

Notices and Upcoming Events

October 1, 2008
Horse Farm Workshop, Edgewood Farm, 2550 Ritchie Marlboro Road, Upper Marlboro, MD. For more information or directions, please contact Eileen Beard at Prince George's Soil Conservation District by phone 301-574-5162 ext. 3 or Email: Eileen.Beard@md.nacdnet.net

October 2, 2008
Around the Paddock , Glenwillow Farm, 6710 Picnic Woods Road, Jefferson, MD. For more information contact Corey Brink at 301-695-2803 ext. 3 or Email: Corey.Brink@md.usda.gov

October 6, 2008
Pole Lima Bean Twilight Tour & Workshop, Delaware State University Smyrna Outreach & Research Center (884 Smyrna- Leipsic Rd, Smyrna DE 19977). Contact John Clendaniel at 302-857-6425 or Email at jclendaniel@desu.edu

Octobetr 6-8, 2008
Urban Wheat Field Experience, New York City's South Street Seaport. Contact Lynn Holly, Wheat Foods Council at 303-840-8787 or Email: lholly@wheatfoods.org or for the on-site event coordinator contact Colleen Hart, Burson-Marsteller for Wheat Foods Council at 917-306-8763 or 330-256-4737 or Email: colleen.hart@bm.com

October 8-9, 2008
The Mid-Atlantic Dairy Grazing Conference and Organic Field Day, Weyers Cave, VA 304.293.6131 x4231 or Email: Becky.Casteel@mail.wvu.edu
http://www.wvu.edu/~agexten/forglvst/08MidAtlanticDairyGrazingConference.pdf

October 21-22, 2008
Keystone Crop and Soil Conference , Grantville, PA. For more information contact John Rowehl at 717-840-7408 (direct 7186) Fax: 717-755-5968 or Email: jrowehl@psu.ed

October 24, 2008
Lakota Bull Test Field Day , Remington, VA. Contact Jeremy Engh at 540-937-4264 or Email: enghs@aol.com or go to http://www.lakotareddevons.com/BullTest.html

November 8, 2008
University of Maryland/University of Delaware Horse Conference, Chesapeake College, Wye Mills, Maryland. For more information or registration packets visit the following website: http://www.equinestudies.umd.edu/Extension/horseconference2008.html

January 5-9, 2009
Delaware Ag Week, Harrington, DE. Contact Cory Whaley at 302-856-7303 or Email: whaley@udel.edu

> **Delaware—Maryland Hay and Pasture Day, Evening Program for Part-time Hay and Pasture Producers, Equine Pasture Management Program, and Agronomy/Soybean Day**

January 12-15, 2009
Optimizing Livestock and Forages Efficiencies in Times of Change, Reva, Mt. Crawford, Lynchburg, and Wytheville, VA. Contact Margaret Kenny, makenney@vt.edu or 434-292-5331 http://arecs.vaes.vt.edu/arec.cfm?webname=blackstone

February 11-12, 2009
Virginia Beef Industry Annual Convention and Trade Show, Roanoke, VA. For information call (540) 992-1009 or visit http://www.vacattlemen.org/

February 18, 2009
2009 Delmarva Dairy Days , Hartly Fire Hall, Hartly, DE. For more information contact Dr. Limin Kung, Jr. at 302-831-2822 or Email: LKSILAGE@udel.edu

March 6-7, 2009
Appalachian Grazing Conference, Morgantown, WV. For more information contact Becky Casteel at (304) 293-6131 x4231 or Becky.Casteel@mail.wvu.edu or visit http://www.wvca.us/grazing_conference/

April 17-19, 2009
Virginia Beef Expo, Rockingham, VA. For more information call (540) 992-1009 or visit http://www.vacattlemen.org/

June 21-24, 2009
American Forage and Grassland Council Annual Conference, Grand Rapids, MI. Contact Michael Bandy at 800-944-2342 or email info@afgc.org or visit http://www.afgc.org/mc/community/eventdetails.do?eventId=149462&orgId=afgc

Newsletter Web Address

The Regional Agronomist Newsletter is posted on several web sites. Among these are the following locations:

http://www.grains.cses.vt.edu/grains/Articles/articles.htm

or

www.mdcrops.umd.edu Click on Newsletter

Photographs for Newsletter Cover

To view more of Todd White's Bucks County photographs, please visit the following web site:

www.scenicbuckscounty.com