Virginia Cooperative Extension

Farm Business Management Update
April-May 2011

Farm Business Management Update is a joint effort of the Agricultural and Applied Economics faculty and the area farm management educators. Subject matter areas include timely information on farm management, marketing, tax management, finance, credit, labor, agricultural law, agri-business, estate planning, 4-H and economic education, natural resources, and CRD. Please feel free to reproduce any article. However, please cite the title, author(s), date, and this newsletter.

Farm Business Management Update is electronically accessible via the Virginia Cooperative Extension World Wide Web site (www.ext.vt.edu/news/index.html). To see the articles listed in the reverse chronological order, look under the listing of "Newsletters," then select "Farm Business Management Update."

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Rotational Grazing Recycles Nutrients

By Peter Callan (peter.callan@vt.edu), Extension Agent, Farm Business Management, Northern District

Due to the dramatic increase in fertilizer prices over the past six months, producers are wondering how they can get the most bang for their buck with limited funds for fertilizer and lime purchases. A current soil test takes out the guesswork and prevents the producer from under or over-applying lime and fertilizer, either of which will decrease your efficiency and profitability. Virginia Tech soil test laboratory recommendations are based on research conducted for Virginia soils and climate. Livestock producers can reduce fertilizer purchases by implementing rotational grazing systems on their farms.

Rotational grazing is a management intensive system that concentrates animals within a relatively small area (paddock) for a short period of time, e.g. 1-3 days for beef cattle. Pastures are divided into multiple paddocks using a temporary fence. Moving livestock to another paddock before over-grazing allows the forage to recover and resume growth. Animals are moved according to a flexible schedule based on herd size, the amount of land available, quality of forages in the paddock, and forage consumption.

Missouri[1] researchers estimated that grazing animals recycle 75-85% of forage nutrients consumed. An even distribution of manure throughout a paddock is required for productive plant growth. Intensity of grazing rotations affects the manure coverage in paddocks. In an intensive rotational grazing system there is an even distribution of manure because animals compete for the available forage the paddock before being moved to another paddock. The Missouri researchers calculated that under continuous grazing practices it would take 27 years to obtain one manure pile per every square yard within a pasture. Conversely, it would take 2 years to achieve the same manure pile density using a two-day rotation.[2]

The location of hay feeding areas also impact the distribution of nutrients within a field with most manure being deposited near the feeding areas. Depending on weather conditions and the potential for creating ruts in the pasture, feeding areas should be moved throughout the pasture to insure a more even distribution of nutrients. Whenever hay is baled, nutrients are removed from the field and exported to the feeding area. Kentucky researchers have estimated that a ton of grass hay (fescue, orchard grass) removes the following nutrients from the soil: 12 lbs. of phosphate and 50 lbs. of potash.[3] If these nutrients are not replaced, nutrient availability from the soil will be depleted over time. Consequently, there will be a reduction in hay and forage yields. Soil testing determines the amount to fertilizer that needs to be applied to maintain hay yields.

Cooperative extension educators can assist producers in the design of rotational grazing systems for their farms. Virginia Cooperative Extension work has shown that the implementation of rotational system can maximize profitability for cow/calf producers. There are Virginia

[1] Bellows, B. 2001. Nutrient Cycling in Pastures. National Sustainable Agriculture Information Service.
[2] Lory, J. and C. Roberts. 2000. Managing nutrients in pastures to improve profitability and water quality. In: G. J. Bishop-Hurley, S.A. Hamilton, and R. Kallenbach (eds.), Missouri Dairy.
[3] Smith, R. 2008. Soil Test Should Drive Fertilizer Decisions. Hay and Forage Grower.

livestock producers who have reported increased net profits of $200 per head due to the implementation of rotational grazing systems on their farms. Rotational grazing systems can maximize farm profitability by recycling nutrients which results in a major reduction of purchased fertilizer inputs.

The Management Calendar

By Gordon Groover (groover@vt.edu), Extension Economist, Farm Management, Department of Agricultural and Applied Economics, Virginia Tech

We live in a global market place with corn flirting with $7.00/bu and beef and dairy prices increasing, in part because of export demand. The new crop season allows farmers to take advantage of these higher prices, but they also face higher prices for inputs including fertilizer, fuel, machinery, feed, and all forms of technology whether in seeds or vials. Farm business managers need to develop record systems on information that allow for quickly calculating enterprise profitability and ranking of alternatives based on potential profits. Basic enterprise budgets from Cooperative Extension can be updated to address the individual needs of a farm business. To properly use budgets all information should be changed to reflect your farms costs, yields, and prices. To find an example of an enterprise budget for Virginia see www.pubs.ext.vt.edu/category/enterprise-budgets.html. To locate enterprise budgets from all over the U.S. visit the Ag Risk Budget Library at www.agrisk.umn.edu/Budgets/CustomSearch.aspx. Careful use of enterprise budgets will give managers a chance to bring the complexities of the global market into focus as you help make production decisions.

Listed below are the items that need to be included on the farm business managers' calendar for spring of 2011.

- Make sure your Virginia state income taxes are postmarked by May 1.
- Review first quarter livestock records and compare them to last year's; look for problems and successes.
- Livestock producers should develop a detailed feed budget each year. Include current feed costs, estimate this year's production under average and drought conditions, and estimate demand until spring of 2012. Deficits should be addressed now. First, look locally for alternatives. For example, can you contract with a neighbor to buy their forages or grains, can you rent additional land, can you work with a grain farmer to harvest his grain crop as silage, can you buy grain at harvest at a discount, consider high moisture grain, and so on? Second, if you cannot find local solutions then look to reputable brokers for forages and try to line up part of your supply needs this spring. As the season progresses, keep the budget up-to-date to make sure you have covered your feed demand one year out.
- Follow up with your lender to review and update your line-of-credit needs because higher feed, fuel, fertilizer, and input other prices may strain previous estimates.
- Prepare a crop record keeping system for a new year.
- Update your marketing plan by collecting information on prices and world market situations. Be sure to check with your local Farm Service Agency for changes in

government programs and signup deadlines. Review USDA and other crop and price forecasts. You can receive notification of all USDA reports now via many different media. See the following web site for details: www.usda.gov/wps/portal/usda/usdahome?navid=USDA_STR

Listed below are the items that need to be included on the farm business managers' reading list and calendar for the next two months.

- Wondering about profitable use of nitrogen in your hay fields, then take a look at Greg Halich's paper titled "Profitability of Spring Hayfield Nitrogen Applications – 2011 Guide" (AEC 2011-04) is available at: www.ca.uky.edu/cmspubsclass/files/ghalich/ProfitabilitySpringHayfieldNitrogenApplications2011.pdf.
- Interesting article from the Richmond Federal Reserve on small business lending alternatives see: www.richmondfed.org/publications/community_development/marketwise_community/2011/vol02_issue01.cfm?WT.mc_id=110012.
- Looking for information on a broad range of demographic, economic, and agricultural data on rural areas across the United States? The Atlas of Rural and Small-town America, developed by USDA's Economic Research Service, provides county-level mapping of over 60 statistical indicators depicting conditions and trends across different types of non-metro regions. To start searching see: www.ers.usda.gov/data/ruralatlas/atlas.htm#map
- Want to understand the breadth of the U.S. beef cow-calf production system? If yes, take a look at the USDA-ERS publication, "The Diverse Structure and Organization of U.S. Beef Cow-Calf Farms" found at www.ers.usda.gov/Publications/EIB73/.

Matching Farm Resources with Market Trends

By Tom Stanley (stanleyt@vt.edu), Extension Agent, Farm Business Management, Northern District

The diverse array of products produced on Virginia farms go into three general market outlets: 1) international commodity markets; 2) national/regional commodity markets; and 3) local markets. All three of these markets are projected to offer new opportunities in the years and decades ahead. In many areas of Virginia, patterns of land ownership, land tenure, and our proximity to markets will open new doors for farmers.

Research indicates that by 2050, the world's population will grow from 6 billion to 9 billion people, our planet will have to produce 70 percent more food, and at the same time use scarce natural resources more efficiently due to the demands for water and energy.[4] This implies a continued need for large scale, highly efficient production of staple food commodities for domestic and international trade. Virginia's topography, soil types, and pattern of land ownership imply opportunity to participate in this market is limited, with our primary

[4] World Food and Agriculture Organization, Rome, 2009

agricultural product for export continuing to be poultry, tobacco, and grains. On the other hand, Virginia is centrally located in the wealthiest (on a per capita basis) consumer market in the world where less than 10% of disposable income is spent on food.[5] This implies Virginia farms have an opportunity to capture premiums in this regional/local market that are unavailable to farms in the Midwest or West. Our dairy and poultry industries have long relied on this market advantage, and now many farmers are building a very positive reputation as a source for fresh-picked high-value perishable crops that are within a reasonable travel distance of major metropolitan areas.

This brings us to a third market that has gained significant attention in recent years and that is locally-grown farm products. A very engaged and enthusiastic segment of the consumer market is sending very strong market signals demanding locally grown food products. While the cost/benefit analysis of this system and the efficiencies with which food can be locally produced are debated by some, there appears to be a sustained demand for locally produced consumer-ready farm products. Some even have debated how the term 'local' is defined. I suggest that farmers not get bogged-down in such debates but rather start exploring and determining if entering the locally grown markets is feasible for their farms business.

Most significantly, I believe the local markets are offering farms that have not traditionally grown fresh-picked produce an opportunity to experiment and learn about producing these crops. For the farms that try, some will find their labor and other resources limit the extent to which they can participate in these markets and, for others, these markets will provide a profitable means to sell welcomed 'local' products in nearby metropolitan areas.

Probably the greatest barrier to entry in this market will be the availability of labor on farms. Fresh-picked consumer-ready produce is labor intensive and many farms do not have the labor force to grow vegetables or fruits on a large scale. However, as area farmers have experimented with these crops and begun exploring markets, some have pooled resources or learned about crops that match their available labor.

Since 2007 Virginia farmers have experienced a jarring roller coaster ride of prices in the traditional commodity markets. Many of these farmers are more deeply concerned than ever about the sustainability of profitable farming. I contend that despite all the difficulties the world's increasing demand for food will open great opportunities for Virginia farmers, both for those that achieve the efficiencies necessary to produce our traditional commodities and for farms that are willing to explore different crops and markets allowing for creative use of their land, capital, and labor resources.

[5] Economic Research Service, USDA, 2009

Artificial Insemination Vs Natural Bull Service – Where are the Economic Benefits?

By Matthew I. Miller (mamille6@vt.edu), Extension Agent, Farm Business Management, Southwest District

As the calendar turns to April driving down country roads the cows are eating through the fences, the calves are beginning to show their genetic merit, and the bulls are watching anxiously from their isolation pens for the gate to open and the breeding to commence.

After the Southwest VA BCIA sale set a record sale average recently in Wytheville, it's clear that bulls are a major investment in any cow calf operation and producers are recognizing the importance of genetic merit in their operation's bottom-line. Many of Virginia's leading commercial herds have utilized artificial insemination (AI) for years as a tool to use elite genetics and improve herd reproductive performance and pounds of calf weaned per cow exposed. Much has been written in the popular press about the benefits of AI and yet less than 15% of cow calf operations use AI. Economic considerations illustrate the impact AI can have and perhaps in today's marketing environment the argument for AI has grown stronger.

One major consideration is that to utilize AI effectively and reap some of the economic benefits it must be coupled with an effective Estrus Synchronization (ES) protocol. Why? Solely using AI doesn't allow for greater return on investment. If we assume that a producer will just utilize AI, it implies they will visually heat check over a period of days or weeks to achieve an acceptable level of pregnancy. That does not create the same "package" of calves that AI coupled with Estrus Synchronization allows. Estrus Synchronization is the manipulation of a group of cows so that their "heats" are tightly timed. Some protocols group cows to a few days while others may group to a few hours. Estrus Synchronization allows producers to concentrate labor resources and attention to a tighter breeding window and focus their efforts to achieve the highest percentage of cows in heat during any set period of time. It is a misnomer to use AI as a justification for economic gains, a more accurate statement is the ES and AI coupled together allows for greater economic gains.

When costs per pregnancy are examined in both an ES/AI system and a natural-service scenario, many factors must be considered. For example, conception percentage in the ES/AI system can vary greatly. If ES/AI performance is poor or below average, the costs per pregnancy in the AI system will certainly increase. Conversely, in the natural service scenario the purchase price and stocking rate fluctuates widely among operations and again will greatly impact the cost per pregnancy.

Based on the assumptions listed in Table 1, the cost more per pregnancy using ES/AI will be greater for the typical Virginia commercial herd than if they use a bull ($16 more). Question: Are there additional returns from the calves produced via ES/AI? The short answer is Yes! But how much?

Table 1. Cost per Pregnancy Comparing ES/AI to Natural Service

ES/AI

Semen	**$15**
Prostaglandin	**$3**
GnRH	**$3**
Time / Personal Labor	**$7**
Technician Charge per Cow	**$5**
Total Cost	**$33**
Conception % = 65% **Cost Per Pregnancy**	**$51**

Natural

Purchase Cost	**$2600/ bull**
Salvage Value	**$1100/ bull**
	$1500 / bull
Years of Service	**4 yrs = 375/yr**
Cows exposed per season	**25/ yr**
Bull Costs per Cow Exposed	**$15**
Bull Cost (Feed, Vet, Yardage) etc.	**$400 /yr or $16/ hd** **Total Bull Costs per hd / yr = $31**
Conception % = 90% **Cost Per Pregnancy**	**$35**

Examining the added value of the calves produced through ES/AI, we first need to consider the increased age of the calf relative to a traditional natural service scenario. Research conducted at the University of Kentucky is illustrated in Table 2 and by itself is evidence that commercial producers can find monetary gain from an ES/AI program implementation. The added age and tighter grouping of birth dates for the calves produced in the ES/AI system resulted in 109 more pounds of calf weaned per cow exposed. In today's current market we could comfortably value that increased weight difference at approximately $135 per cow exposed. Let's recall that we were at an economic disadvantage of approximately $16 per head initially.

Table 2. University of Kentucky Data

	---------Treatment----------		
Item	**ES/AI**	**Natural**	**Diff.**
No. of cows	251	100	--
Calving rate, %	90	81	9
% calving in first 30 days	85	62	23
Average Julian calving date, days	74	84	10
% calf crop weaned	88	79	9
Weaning age, days	210	200	10
Weaning weight, lb.	577	505	72
Calf weight weaned per cow exposed	508	399	109

[a]Adapted from Anderson and Deaton (2003).

However, the value goes beyond the fact that these calves are heavier due to greater age at weaning. Intangibles that are hard to quantify is that producers have a specified due date on ES/AI bred cows. This is translated in a greater efficiency of labor for calving and increased calf survival from both the increased attention to cows during calving as well as selection pressure being placed on bulls for increased calving ease.

Further gains could be expected if calves were either backgrounded or placed in a retained ownership program. Selection for increased yearling growth as well as carcass quality and yield is best maximized in an ES/AI system.

Finally, the biggest gains may be in the value recognized in females produced and retained in the herd utilizing ES/AI protocols. Assuming that selection pressure is placed on maternal traits and maternal performance, these females born early as a result of an ES/AI plan have proven that they excel in comparison to herds where females are a product of natural service sires. These daughters of ES/AI plans have proven to wean heavier calves that also excel in their offspring's ability to maximize profit in feedlot scenarios where selection pressure has been placed on carcass traits.

One final thought about ES/AI. These protocols are well researched to allow beef producers to utilize highly proven bulls in their commercial herds. However, each producer is responsible for the entire management system. ES/AI will not be profitable in herds under poor management situations or where producers place selection pressure on the wrong traits resulting in calves born via AI but lacking the genetic profile to maximize economically important traits. There is no doubt that ES/AI is a time consuming practice that has real risks of failure if the protocols are not followed correctly and the cows are managed poorly. ES/AI cannot feed cows, build cross fences, manage soil fertility, nor vaccinate the cow herd against reproductive failure. ES/AI is the fine tuning that has allowed commercial operations to take their cow herds to the next level for genetic excellence and profit generated per cow. The ability to not only select for elite genetics but market those genetics either as load lots of weaned calves or as finished feedlot cattle is proven to increase dollars returned to the cow compared to their contemporary cow-calf neighbor. There is no question that ES/AI is a valid component of cow calf operations looking to maximize pounds weaned and dollars generated per cow exposed.

Calendar of Events

June

14-17 State 4-H Congress. Virginia Tech Campus, Blacksburg, VA. Contact: Tonya Taylor, totaylor@vt.edu.

27-30 84th State FFA Convention. Virginia Tech Campus, Blacksburg, VA. Contact: Andrew Seibel, phone 540-231-3823 or e-mail gseibel@vt.edu.