# Animal Science E-News

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## Characteristics of Forage Brassica


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Forage brassicas, a winter annual crop, can extend the grazing season in fall when other forages are less productive, therefore reducing the dependence on stored or purchased feed. Forage brassicas grow quickly and provide palatable and nutritious forage for livestock. Grazing may begin 45 to 60 days after seeding, depending on the species and weather. Forage brassicas complement traditional winter annual forages such as ryegrass or small grains by providing grazing for livestock in the fall when traditional winter annuals have limited forage production.

Demonstrations and replicated research trials were conducted to compare forage brassica varieties. Seven-Top turnip was used as a check variety. Eight varieties of forage brassica were used in our trials: Appin, Barkant (turnips), Barsica, Bonar and Winfred (rape), and Pasja, T-Raptor and Vivant (hybrids). Appin, Bonar and Pasja are products of Ampac Seed Company. Barkant, Barsica and T-Raptor are products of Barenbrug Seed Company. Vivant is a product of Mountain View Seed Company and Winfred is a product of PGG Seed Company.

Forage turnips produce a high proportion of leaf yield, have good bulb yield and have good regrowth ability. Forage turnips have a mature height of 20 to 22 inches. Appin produces a small, round bulb (< 5 inches) firmly anchored in the soil. Barkant produces a moderate, oval-shaped bulb (4 to 8 inches), with 50 percent of the bulb on top of the ground. Forage turnips may be rotational grazed or stockpiled. Appin is better suited for rotational grazing than Barkant.

Forage rape is slower establishing than the turnips and turnip hybrids. It produces large

paddle-like leaves with excellent leaf yield. Forage rape has a mature height of 26 to 28 inches. Forage rape has limited regrowth ability and therefore is best suited for stockpiling. Bonar is more susceptible to frost injury than the other forage brassicas.

Forage turnip hybrids have a high leaf-to-bulb ratio, are leafier than other brassicas, have excellent regrowth ability and excellent yield potential. Forage turnip hybrids have a mature height of 22 to 24 inches. Forage turnip hybrids are suitable for rotational grazing or stockpiling. Total yield potential may be increased with rotational grazing.

Seven-Top turnip is commonly used as a vegetable crop but has a history of being used as a forage crop for small ruminants and deer food plots in Arkansas. Seven-Top produces fast, vigorous leaf growth. However, leaf yield from Seven-Top is less than the forage brassicas due to less leaf area and more stems. Seven-Top produces no regrowth and is more susceptible to frost injury than the forage brassicas.


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# Tired of Feeding Hay?

John Jennings, Professor – Extension Forage Specialist

This was a long winter. Hay supplies that looked good last summer ran low or were low in quality. Wouldn't it be nice to not feed as much hay and to let the livestock have more forage to graze? The Arkansas 300-Day Grazing Program has shown that can be done throughout the state.

Results from 300-Day Grazing demonstrations on producers' farms have been carefully monitored. To date over 150 demonstrations have been conducted in 50 counties with a total savings of over $300,000 to producers enrolled in those demonstrations.

The spinoff is that the success of Arkansas producers is getting noticed by folks in other states. Groups from Kentucky and Oklahoma have traveled to Arkansas to listen to producers here talk about what the program has done for their operations. Kentucky is preparing to roll out their version of the program this year called "Grazing for Cash." Writers for 16 different magazines have written 27 articles in regional and national publications. Requests for presentations on the program results have come from Kansas, Missouri, Mississippi, Alabama, Tennessee, Georgia, Indiana and Kentucky.

Producers at these programs frequently comment, "That is the program we need here!" The problem seems to be that more producers here should be making that comment as well. The 2012 drought severely reduced pasture and hay production. Many producers managed for stockpiled fescue or planted winter annual forages such as wheat, ryegrass and brassicas to feed their livestock since hay was scarce and very expensive. Many commented the next spring that those forage practices provided very good grazing and saved their operations because they were so much less expensive than hay. After the rainy summer of 2013, some of those same producers were asked if they would continue the same practices that worked so well in 2012, and most replied, "No, I have lots of hay this year."

The most difficult aspect of achieving a 300-day grazing season is changing our mindset from a hay-based forage system to a grazing-based forage system.

This winter in our 300-Day Grazing herd demonstration at the Livestock and Forestry Research Station at Batesville, no hay was fed until mid February (2013-14). Cows grazed stockpiled bermudagrass and stockpiled fescue nearly all winter. Many of the on-farm 300-Day Grazing demonstrations had a forage base that included fescue and bermudagrass. But, producers farther south where fescue is not as common were skeptical that a 300-day grazing season could work without fescue in the system.

Dr. Paul Beck currently has a trial underway at the Southwest Research Center at Hope with cow/calf systems comparing different grazing management and different stocking rates on a bermudagrass-based system. Early results showed that he achieved 300 days of grazing in southern Arkansas using bermudagrass, stockpiled bermudagrass and interseeded winter annuals instead of fescue. The work is still underway and will yield more information for managing southern forage systems. The 300-Day Grazing Program started with on-farm demonstrations, but it is being supported by research.

The most difficult aspect of achieving a 300-day grazing season is changing our mindset from a hay-based forage system to a grazing-based forage system. When surplus forage is available, the first reaction is to harvest hay, but producers should think of ways to graze the forage instead. That is not to say that no hay is needed, but cutting the winter hay feeding period in half can dramatically reduce expenses.

Most producers do a good job planning for a hay crop, but planning for a pasture crop takes the same management. Planning a pasture crop for each season is really not complicated. Fescue/clover or ryegrass/small grains for spring, bermudagrass or bahiagrass for summer, a combination of these for fall and stockpiled forage for late fall into winter work well to fill out a grazing year. This is a very basic scheme, but other forages can certainly be added. When working with producers to extend the grazing season, we emphasize starting with the forage base they have available. The forages they already have are more economical than the forages they don't have and should be the starting point.

# Vaccination Guidelines – Developing a Vaccination Plan

Mark Russell, Assistant Professor

As the weather warms and the grass begins to grow, so does our interest in hauling down the road to a show, rodeo or to our favorite trail. Many folks have already vaccinated their horses, but for some horse owners, it hasn't been done quite yet. Not to worry, it isn't too late. Before loading up and heading out, there are some important vaccination considerations. The American Association of Equine Practitioners (AAEP) lays out some principles that every horse owner should keep in mind.

A "standard" vaccination program for all horses does not exist. Each individual situation requires evaluation based on the following criteria:

- Risk of disease (anticipated exposure, environmental factors, geographic factors, age, breed, use and sex of the horse)
- Consequences of the disease (morbidity/mortality, zoonotic potential)
- Anticipated effectiveness of the selected product(s)
- Potential for adverse reactions to a vaccine(s)
- Cost of immunization (time, labor and vaccine costs) vs. potential cost of disease (time out of competition; impact of movement restrictions imposed in order to control an outbreak of contagious disease; labor and medication if, or when, horses develop clinical disease and require treatment, or loss of life)

As a horse owner, your best bet is to contact your local veterinarian and discuss what type of vaccination program is the most suitable for your horse. Planning ahead of time with a viable list of considerations is important to the success of protecting your horse.

Keep in mind that the use of antibody titers or other immunological measurements to determine if booster vaccination is warranted is not currently practiced in the horse as standardized tests and, therefore, protective levels of immunity have not been defined in most cases. A correlation between antibody levels and protective immunity under field conditions has not been identified.

Horse owners should have realistic expectations and understand that:

- Vaccination alone, in the absence of good management practices directed at infection control, is not sufficient for the prevention of infectious disease.
- Vaccination serves to minimize the risks of infection but cannot prevent disease in all circumstances.
- The primary series of vaccines and booster doses should be appropriately administered prior to likely exposure.
- Each horse in a population is not protected to an equal degree nor for an equal duration following vaccination.
- Protection is not immediately afforded the patient after administration of a vaccine that is designed to induce active immunity. In most instances, a priming series of multiple doses of a vaccine must be administered initially for that vaccine to induce protective active immunity.
- All horses in a herd should be vaccinated at intervals based on the professional opinion of the attending veterinarian.

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Ideally, the same schedule should be followed for all horses in a population, thus simplifying record keeping, minimizing replication and transmission of infectious agents in a herd and indirectly protecting those horses in the herd that responded poorly to vaccination, thereby optimizing herd immunity.

- A properly administered, licensed product should not be assumed to provide complete protection during any given field epidemic.
- Although rare, there is potential for adverse reactions despite appropriate handling and administration of vaccines.

With proper management practices and planning ahead, the horse owner can better position himself for success.

The AAEP suggests the following vaccinations for adult horses (**Many of these can vary depending on history of vaccination, and if broodmare. Please consult with your local veterinarian**):

- Anthrax – annual. Not recommended during gestation for broodmares and should not be administered concurrently with antibiotics.
- Botulism – annual.
- Equine Herpesvirus (EHV) – annual.
- Influenza – horse with ongoing risk of exposure: semiannual. Horses at low risk of exposure: annual.
- Potomac Horse Fever – semiannual to annual.
- Rotavirus (broodmares) – three-dose series: first dose at 8 months gestation; second and third doses at 4-week intervals thereafter.
- Tetanus
- Rabies
- West Nile

Special thanks to The American Association of Equine Practitioners for their knowledge, expertise and willingness to contribute.

## Technology in Beef Production – How We Will Feed a Growing Population

Paul Beck, Professor

Norman Borlaug has been credited for revolutionizing agriculture in the third world by developing disease-resistant, high-yielding varieties of food crops and emphasizing the use of intensive cropping through fertilizers and herbicides. Wheat yields in the third word have increased by over 250 percent from 1950 to 2000. This was instrumental in the Green Revolution which is credited with saving a billion lives from starvation in Mexico, India and Pakistan. One of Dr. Borlaug's theories is that increased production on the best cropping acres will decrease the demand for land and thus decrease deforestation.

It has been estimated that we must again double food production by the year 2050 due to population growth worldwide. There is also increased demand for animal proteins in diets of people worldwide. This demand must be met even though there is limited availability of arable land. Seventy percent of the increased food production must come from efficiency-improving technology. Improved production efficiency through technology has multiple benefits: 1) dramatically reducing production costs; 2) reducing land needed to produce an equivalent amount of food for consumers; 3) limiting the production of greenhouse gasses per unit of food produced; and 4) decreasing food costs to consumers.

Reproductive technologies in beef cattle can be used to improve production efficiency. An old technology that has been largely forgotten in current production is heterosis or "hybrid vigor," defined as the added advantage in performance of a crossbred over the average of its purebred parents. The improvement from hybrid vigor is 6 to 8 percent for maternal traits like calving rate and weaning rate, 11 percent for weaning weight and up to 38 percent for traits like cow longevity.

Other underutilized technologies in the beef industry are artificial insemination and estrus synchronization, which allows the use of genetically superior bull genetics without owning the bull and also allows the use of fewer bulls in multi-sire herds (cowherds with 50 or more cows). In using estrus synchronization (increasing early calves and compacting the calving season), artificial insemination (using superior bulls) and crossbreeding in cleanup bulls (to get the hybrid vigor of natural service calves), a

50-cow herd can increase net returns by nearly $4,500.

Forage production technologies can be used to increase the productivity of our ranches. Fertilization of hay meadows with 50 units of N after each harvest can increase forage yield by 27 pounds of forage per pound of N at a cost of less than 3 cents per pound of grass. Research at the Livestock and Forestry Research Station near Batesville shows that fertilizing bermudagrass pasture with 50 units of N per acre per season will increase carrying capacity by 5 percent and increase gains by 1.5 pounds per pound of N. Forage varieties that are selected for increased growth and persistence can improve animal production and health to a large extent. Inserting nontoxic endophytes into tall fescue varieties increased animal performance by 100 percent, eliminated fescue toxicosis and increased reproductive rates by 80 percent.

Growth-promoting technologies have been used for over 50 years. Anabolic steroid implants are safe and effective growth-promoting agents used in over 90 percent of feedlot cattle. Implants increase growth rate by 10 to 30 percent, feed efficiency by 5 to 20 percent, and carcass weight by 5 to 10 percent. Ionophores are compounds that alter the population of rumen microbes, increasing the metabolic efficiency of cattle and decreasing the amount of greenhouse gas production. Ionophores increase growth by 5 to 20 percent and feed efficiency by 20 to 25 percent. Beta agonists are the newest growth-promoting technology. They act similar to naturally-occurring compounds like epinephrine and norepinephrine (or the asthma medicine Clenbuterol) and are fed only during the final 20 to 48 days of finishing in the feedlot. Beta agonists increase slaughter weight by about 2 percent but increase hot carcass weight by 5 percent because of a large increase in muscle deposition and reduction in fat. Due to increased technology, to produce the same amount of beef as we produced in 1977, we require 30 percent fewer animals, 19 percent less feed, 12 percent less water and 33 percent less land, meaning we are more sustainable now than ever before.

It is important to remember that all production systems can be sustainable. Improvements can be made to any production system to make it more sustainable. The beef industry is big enough for all types of production. Consumer choice is an important part of our society, and we should do nothing to limit food choice. And technology is and always will be important for production of a sufficient, affordable and safe food supply.

## Seven Counties Are Making the Beef IQ Program a Local Hit

Shane Gadberry, Associate Professor

During the summer of 2013, a committee of county agriculture agents met to lay the foundation for taking a statewide program and adapting it to a local focus, catered to their clientele. The goal of the Beef IQ program has always been to provide in-depth beef cattle production management training in areas of herd health and well-being, pasture management, genetics and selection, nutrition, reproduction and economics. Participant education was accomplished using a combination of informal lecture and hands-on field exercises. Using those six core areas of production management, the committee set two standards: 1) offering 18 hours of classroom and 8 hours of field day activities and 2) keeping the registration price the same for all participants. As a county-delivered program, these agents created the flexibility to offer the course however they choose. In the fall of 2013, two multi-county groups took on the challenge of being the first to offer this program.

One multi-county group consists of Boone, Marion, Newton and Searcy counties with an enrollment of 21. This group launched their program in December 2013 and thus far has provided lessons in reproduction and nutrition. As part of the nutrition session, participants had hay samples analyzed for nutrient composition. In an upcoming field day, lessons on pelvic measurement as a tool in replacement heifer management and calf processing at the chute will be taught. This county group is also using registration fees to provide participants pasture sticks for estimating available forage, and the participants will be taught sprayer and seeder calibration during their forage field day.

The second county group launched its program in January 2014 and has approximately 40 participants enrolled. This group consists of Conway, Faulkner and Van Buren counties. This group took a different approach in opening enrollment to 4-H members as well as adult participants.

The first topic this group took on was economics. This topic could be considered a challenge since Arkansas does not have an Extension livestock economist. This group looked to local and out-of-state resources for training. A local Farm Credit representative was invited to discuss lending procedures, a local accountant discussed tax implications and using web meeting technology, the participants received a presentation on available spreadsheet decision aids from Oklahoma State University. This group has also covered reproduction, genetics and will cover calf processing procedures at the chute during their upcoming field day in April.

In addition to the educational resources provided at the sessions, Beef IQ participants have access to a program support web site, www.arbeefiq.com, where they can view recorded presentations, how-to demonstrations and spreadsheet decision aids. The development of this web site was initially made possible through a grant provided by Farm Credit Services of Western Arkansas.

County Extension agents interested in hosting the Beef IQ program should visit with a colleague in a participating county or contact Shane Gadberry in the Animal Science department.