

Symposium: Forages and Pastures: Forage-Based Systems for Beef and Dairy Cattle Production: Regional Challenges and Opportunities

269 Northeast opportunities and challenges for forage-based beef and dairy production. K. J. Soder*, USDA-ARS, Pasture Systems & Watershed Mgmt. Research Unit, University Park, PA.

Forage-based livestock systems generate nearly two-thirds of current agricultural income in the northeastern U.S. Much of the agricultural land in this region is best suited for forage production due to soil, site, and climatic limitations for other agricultural practices. Many opportunities exist to promote forage-based dairy and beef systems. Research has shown that grazing systems require less grain and fuel inputs than those relying heavily on cropping and confinement feeding systems. Potential exists to utilize abandoned land for grazing enterprises which may present a low-cost option to lease or buy this land while maintaining a 'greenscape' desired by the general populace. The Northeast is situated among several high-population areas that are becoming more aware of food origin and are willing to pay more for actual or perceived benefits from locally- and forage-produced food. Specialty and direct markets exist in the Northeast, some growing at a rate of 20-40%/yr, including organic production, community-supported agriculture (CSA) and farmers markets where locally-produced products are marketed directly to the consumer. While opportunities are plentiful, there are also formidable challenges to Northeast agriculture. Even though abandoned land may be available for grazing, this land is often in very small parcels and surrounded by urban development. Urban pressure challenges animal agriculture, including inflated land prices, animal welfare/rights issues, and non-farm public concerns with inputs, nutrient management, and odors associated with farming practices. Lack of custom processing facilities is causing a bottleneck in the direct market trade, particularly for beef operations. Current consumer economic trends may be a concern if disposable income decreases, as the ability or desire to purchase value-added products may decrease. Sustainability of agriculture in the Northeast depends on keeping forage-based livestock systems competitive and profitable while protecting the environment. Final thoughts will include potential future directions for research and management improvements.

Key Words: Challenges, Forage-Based, Northeast

270 Forage-based systems for the Upper Midwest. W. K. Coblenz*, US Dairy Forage Research Center, Marshfield, WI.

Recently, the dynamics of agricultural production have changed, particularly as prices for cash-grain crops, such as corn (*Zea Mays L.*) increase with demand for ethanol production. Other changes likely will be needed to meet increasing public demands for environmentally responsible nutrient management, as well as expanding markets for grazing-based and/or organically produced milk and meat products. Our objectives are to discuss how these external pressures may affect forage systems throughout the region, and identify potential focus areas for future forage research. Excepting corn silage, potential focus areas for research can be divided into five areas: i) improving alfalfa (*Medicago sativa L.*) and other legumes; ii) improving grazing systems; iii) unique forage needs of specific livestock classes; iv) harvest and storage of forage crops; and v) strategies for improved nutrient management.

Within each of these broad areas, it is possible to identify specific needs that are both traditional, as well as new and unique. For alfalfa, new research may evaluate alfalfa varieties or management schemes that permit less-frequent harvests, harvest by plant part for multiple end uses (livestock and energy), improved grazing tolerance, and reduced proteolysis during silage fermentation. Grazing initiatives may include assessment of long-term health benefits of grazing, supplementation strategies for grazing dairy cows, strategies to supply adequate forage during the summer slump or gap, and forage options that extend the grazing season. Continued research will be required to assess proper agronomic management of low-cation grass forages for nonlactating dry cows, as well as viable low-energy forages to dilute replacement-heifer diets comprised primarily of corn silage or by-products of ethanol production. Finally, improving nutrient management will require increased opportunities for summer spreading, as well as evaluation of new application methods engineered to reduce volatilization and runoff. Addressing changing forage research needs will require creativity and diligence by scientists, but such efforts are essential for the long-term stability of the dairy and beef industries.

Key Words: Forage Systems

271 Opportunities and obstacles for forage-based dairy and beef production in the Southeastern U.S. J. Andrae*, Clemson University, Clemson, SC.

Increasing feed, fuel and fertilizer costs are pressuring dairy, cow-calf, and stocker producers to manage forages more efficiently. High rainfall and moderate winters in the southeastern U.S. are perhaps the regions biggest competitive advantage. These provide a long growing season with minimal stored feed requirements. High quality, productive forage species like novel endophyte-infected tall fescue and winter annuals are widely grown. Summer conditions are favorable for subtropical legumes and grasses which can support moderate animal performance with minimal input costs. The availability of dependable and relatively inexpensive irrigation in some areas has fueled recent foreign investments in grazing dairies. Regional metropolitan areas also provide direct marketing opportunities for both milk and meat products. Forage-based beef and dairy production also face several obstacles in the southeast. Acidic soils often limit legume production. The lack of a persistent, perennial cool season grass species for the Coastal Plain increases reliance on annual grasses and creates a severe forage gap from late October through December. Much of the forage produced across the region is inefficiently utilized due to a widespread ignorance of grazing management practices. However, the largest impediment to southeastern forage-based operations is a producer resistance to accept risk or modify traditional management practices. Most prior forage research in this region has focused upon the extensive management of traditional species. Integrated system-wide grazing research is needed to explore multiple forage species under intensively managed dryland and irrigated scenarios. The development and improved management of high quality complimentary forages (both grasses and legumes) could further extend the grazing season, minimize nitrogen inputs, decrease risk, and improve profitability of stocker and dairy operations in the southeastern U.S.

Economic and environmental impacts of these management practices also warrant investigation.

Key Words: Grazing, Forage, Southeast

272 Forage-based systems for beef and dairy cattle production: Challenges and opportunities in the South Central region. W. A. Phillips^{*1}, G. W. Horn², and B. K. Northup¹, ¹USDA-ARS Grazinglands Research Laboratory, El Reno, OK, ²Oklahoma Agricultural Experiment Station, Stillwater, OK.

The states of Kansas, Oklahoma, Texas, Missouri, Arkansas and Louisiana comprise the South Central Region (SCR) and contain 106 million ha of agricultural land, with roughly equal halves under crop and forage production. The region is also home to 33 million beef cows and calves and 0.7 million dairy cows. The SCR is a mosaic of eco-regions varying from sub-tropic to temperate and humid to dry domains, supporting a diverse range of plant communities. In the future, forage-based production systems in the SCR will have to compete with cropping enterprises for land, water and inorganic N, and utilize perennial forages more than annual species. Further, the region's most productive agricultural land will see increased use for grain production, to meet the increasing demands for ethanol as bio-fuel. Therefore, forage-based beef- and dairy-production systems will have to use marginal lands and employ limited amounts of expensive inorganic N. Forage-based systems have the potential to play important roles in agricultural production in the SCR. Opportunities for improving production in forage-based systems exist in utilizing bio-fuel byproducts as a feedstock, incorporating legumes as a renewable N source, extending the grazing season with combinations of cool- and warm-season swards, developing drought tolerant cultivars, increasing forage yields per unit of fossil fuel input, integrating management strategies to maximizes revenue for sequestering carbon, and applying precision agricultural tools to production systems.

Key Words: Forages, Pasture, Grazing

273 Forage-based systems for beef production: Western regional challenges and opportunities. K. C. Olson^{*1} and B. L. Waldron², ¹South Dakota State University, Rapid City, ²USDA-ARS Forage and Range Research Laboratory, Logan, UT.

There are two divergent forage-based production systems in the western U.S. based on land type and ownership. The first system is based on native rangeland. Much of this is public land but some is privately owned. The other system is based on tame pastures on privately-owned land, much of which is irrigated. These two land types lend themselves to extensive vs. intensive management systems, respectively. Public rangelands are managed based on multiple use, meaning that livestock grazing is only one of many uses and services this land must provide. Thus, management of the land and the forage base is not limited just to livestock production. These rangelands are spatially and temporally diverse. This lends grazing management to seasonal patterns of use based on the suitability of the forage as a nutrient resource. The most typical seasonal-suitability grazing pattern is based on the elevation gradient in the mountain west wherein cattle forage at lowest elevations (valley floors) in winter, middle elevations (foothills) in spring and fall, and upper elevations (mountains) in summer. This allows livestock to graze when forage nutritional value and vegetation tolerance of grazing are both high. Challenges to these systems include invasion by noxious, weedy species of limited or no forage value. Research opportunities include developing alternative forage species that not only contribute forage to overcome bottlenecks in seasonal suitability grazing, but also provide other ecological uses and services. On intensive-managed irrigated-pasture systems, forage productivity and nutrient density may exceed the requirements of a typical cow-calf enterprise. Opportunities exist to develop pasture-based growing and finishing systems that may focus on producing beef for natural and organic niche markets. An array of research questions need to be answered for these novel systems, including pasture, nutritional, breeding, and reproductive management, as well as production alternatives such as calving and weaning dates. Alternatives should be evaluated in a systems approach to ascertain overall system response and not just response of the specific alternative.

Key Words: Beef Cattle, Grazing, Forages