

Grass-Fed Cattle Follow the Appalachian Trail

A major project is under way to design year-round grazing systems for pasture-raised beef in the Appalachian Mountains and the Southeast. More than 20 scientists are involved, including animal nutritionists and behaviorists, meat scientists, agronomists, extension agents, veterinarians, economists, plant physiologists, and soil scientists.

Although some U.S. farmers already raise grass-fed beef, “Our ultimate goals are to extend the grazing season to year-round and produce a consistently high-quality product,” says James P. S. Neel. He’s an animal scientist at the ARS Farming Systems Laboratory in Beaver, West Virginia. “A year-round grazing season would ensure that fresh beef is available throughout the year.

“This could also be done by having grass-fed herds from north to south throughout the Appalachian region. That would take advantage of southern winters, which are mild, and avoid the problems of hot-weather pastures,” Neel says.

The Appalachian area has mostly small family farms on which calves are raised, typically on 50 to 500 acres of woods and pasture. The land is generally too steep to plant crops, so grazing livestock is common. But these farms have trouble competing with larger, highly mechanized farms for the beef

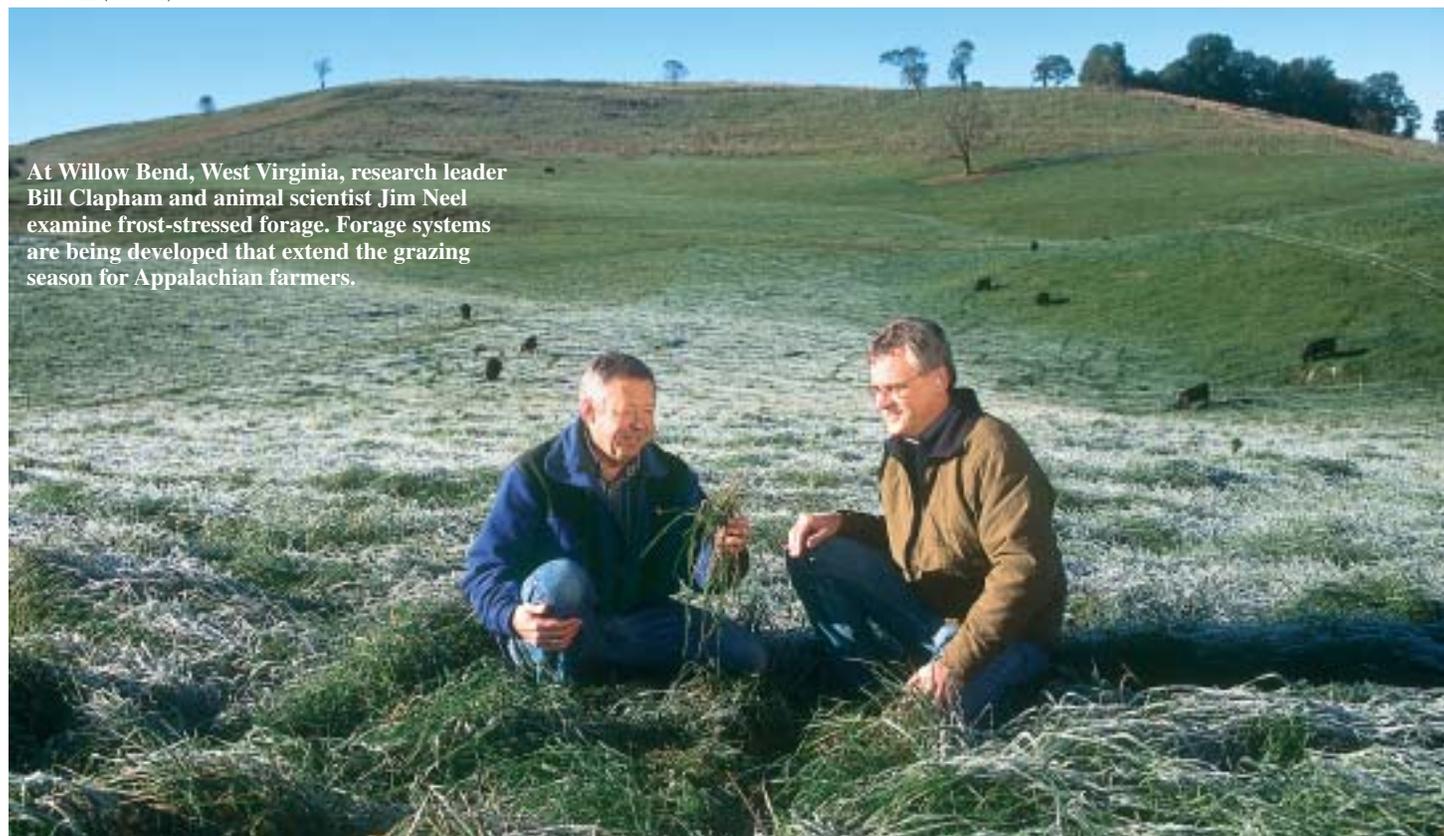
market. Research leader William M. Clapham and others at the Beaver lab thought that these farms might do better aiming for the grass-fed, “natural” beef niche, directly marketing the beef to retail outlets and grocery suppliers.

Cattle would graze Appalachian pastures intensively and be rotated from paddock to paddock, just as grass-fed Argentine cattle graze on the South American pampas. The Argentine niche product commands a premium price in specialty food markets and is currently supplied to American restaurants, supermarkets, and health food stores. Appalachian beef could capture some of this market and increase the net income of the farmers in the Appalachian area.

An Ambitious Joint Endeavor

This project is running the gamut of beef production and marketing—from birth to plate. It’s broad in scope and is a collaboration of four institutions in three states. Working with the ARS scientists in Beaver are colleagues at the Virginia Polytechnic Institute and State University (Virginia Tech), West Virginia University (WVU), and the University of Georgia (UGA). This collaboration is unique because resources are pooled, and each phase of the production stream is assigned to a different institution. Virginia Tech is responsible for the cow/

PEGGY GREB (K10994-2)



At Willow Bend, West Virginia, research leader Bill Clapham and animal scientist Jim Neel examine frost-stressed forage. Forage systems are being developed that extend the grazing season for Appalachian farmers.



Jim Neel uses ultrasound on finishing steers at Willow Bend, West Virginia, to estimate back fat, rib eye area, and intramuscular marbling, all indicators of meat quality.

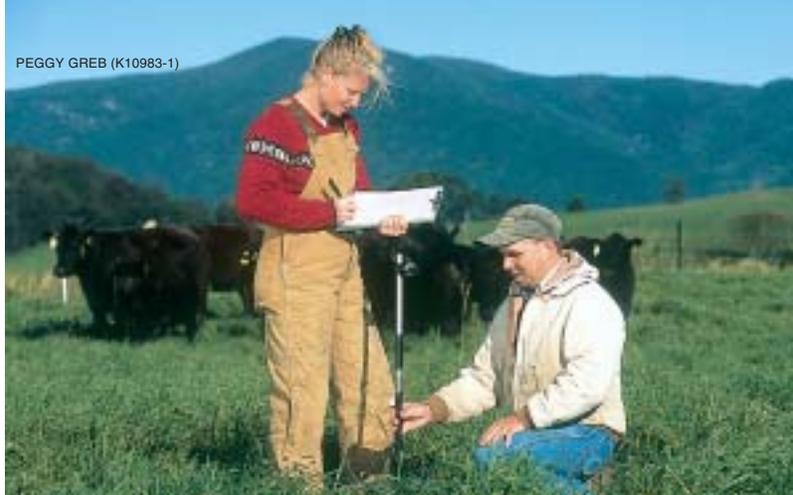
calf operation from birth to weaning, preparing the cattle for wintering or market, and conducting the feedlot control at Steele's Tavern, Virginia, near Staunton. WVU is responsible for heifer development and the winter stocker phase in Morgantown, West Virginia. ARS is responsible for pasture finishing at Willow Bend, West Virginia, and overall project management. UGA, in Athens, Georgia, is responsible for meat analysis and conducting a taste panel.

The first 4 years of the project are for testing various production techniques through three calf-to-market cycles. Then the scientists will use on-farm pilot projects to transfer successful techniques to farmers in the central Appalachian Mountain region. "Actually," says Neel, "we're giving out information to farmers as we go. Each institution has designed different pasture systems to meet farmer goals while minimizing possible financial harm from drought and other risks."

Researchers focus on the three aspects of pasture management that farmers have control over: fertilizing and conditioning soil, establishing and managing pastures, and grazing livestock. They're also testing varying levels of fertilizers, measuring everything from grass growth to environmental influence and checking the quality of both the soil and pasture grasses. They assess the risks associated with different production strategies and the likely level of consumer interest in the product.

Methods are surprisingly high-tech, like using near-infrared-reflectance spectroscopy to determine pasture quality and ultrasound to measure body composition changes from winter through the finishing period. Computer models correlate various factors—such as animal health, forage quality, and weather—with deviations from target gains. Clapham modeled growth and development of several forages and designed the pasture systems for WVU's farm in Willow Bend. This system took into account environmental extremes and lowered risks associated with weather.

In spring 2001, the first calves were born at Willow Bend and at the Steele's Tavern farm. They were weaned and then sent to Morgantown in early December for winter-feeding treatments. In April 2002, half the steers were sent to a feedlot in Steele's Tavern, while the rest stayed in West Virginia to graze rotationally.



At the Virginia Tech Shenandoah Valley Agricultural Research and Extension Center, technician Marnie Caldwell (left) and farm manager Dave Cuddy record plate meter measurements, which are used to estimate forage yields in cow-calf grazing paddocks.

"Pasture-finished animals were fed only high-quality forage at all times—as much as they wanted," says Neel. The feedlot cattle were finished the traditional way—on corn, corn silage, and protein/mineral supplements. All cattle go to market in the fall of each project year. A rib section from each steer is sent to UGA for meat-quality analysis.

"The meat is leaner than feedlot beef, having half the saturated fat and more of the good types of fat. And it's been as tender and tasty as feedlot beef," Clapham says.

Weight Gain and Meat Quality

Researchers are scrutinizing the effects of different winter weight gains on meat quality to determine exactly how much gain is really optimal. "That knowledge will not only help grass-fed-cattle operations, but also feedlots," says Neel. "We believe that a minimum three-quarter pound gain per day is needed, with steers weighing 650 to 700 pounds after winter. But there's little science to back up those recommendations. Most are based on economics, not quality of the end product."

"We're raising these animals for customers who prefer that their beef come from cattle that consume the food they're uniquely designed to eat—grass and forage plants," says Neel. "We try to keep everything as natural as possible. By not finishing animals in a feedlot, there are no feedlot-related illnesses, and so there's less need for medications. We don't give the grass-fed cattle any antibiotics unless they become sick."

Clapham supervises the entire project, which involves a lot of organizing, scheduling, and managing. It is like a virtual ARS location. "We're unique because we have so many disciplines and locations all working as one team to bring each herd from birth to market," he says.—By **Don Comis**, ARS.

This research is part of Rangeland, Pasture, and Forages (#205) and Food Animal Production (#101), two ARS National Programs described on the World Wide Web at www.nps.ars.usda.gov.

William M. Clapham and James P.S. Neel are with the USDA-ARS Appalachian Farming Systems Research Center, 1224 Airport Rd., Beaver, WV 25813-9423; phone (304) 256-2972, fax (304) 256-2921, e-mail william.clapham@ars.usda.gov, jim.neel@ars.usda.gov. ★