FORAGE-ANIMAL RELATIONSHIPS UNDER GRAZING CONDITIONS FOR SUSTAINABLE PASTURE-BEEF SYSTEMS

FOCUS

Forage Cultivars for Livestock and Wildlife

Team research led to the release of 11 forage varieties and 5 disclosures-licenses for Texas A&M AgriLife Research.

Soil Fertility & Long-term Nutrient Cycling Under Stocking Conditions

Long-term (>40 yrs) stocking of bermudagrass overseeded with ryegrass + N vs clover without N is one-of-a-kind in the US. Soil nutrient research in pastures has documented carbon sequestration and soil N, P, K, Mg, Ca, and pH dynamics. The impacts of this research have re-directed fertilizer N inputs, enhanced use of legumes in pastures, and provided proper stocking strategies for sustainable pastures in Humid Vegetational Zones of the Southeastern US.

Stocking Management Strategies for Sustainable Pastures & Beef

The primary management concerns with forage-animal systems include stocking rate, timing of stocking, and duration-extent of forage defoliation regimens. Dr. Rouquette documented the first research in the US to quantify and identify bermudagrass ecotype diversity under long-term stocking with cows and calves. Research with stocking rates using cow-calf and stocker cattle with bermudagrasses and ryegrass, clover, or small grain + ryegrass pastures have defined forage allowance and average daily gain relationships.

Nutrition and Supplementation of Livestock on Pasture

Research using supplemental protein and/or energy for stockers on bermudagrass or small grain-ryegrass pastures documented daily levels of 0.25 to 0.30% body weight for optimum Supplement:Extra Gain Ratio.

Documentation of Birth-to-Harvest Performance of Tropically Adapted Cattle

This is the only grazing research project in the US that evaluates component performance of beef cattle from Birth-Feedlot-Carcass. Pasture-animal studies have been conducted with a variety of livestock including Quarter Horses, Mexican and Corriente steers, and Holstein heifers, but has focused primarily on Brahman-influenced cattle (F-1 HxB;AxB) and terminal sires such as Simmental. Other tropically-adapted breedtypes evaluated under pasture-stocking included Senepol, Tuli, Romosinuano, and Bonsmara. Dr. Rouquette conducted the first research in the US using Bonsmara for Natural Beef production. This long-term research led to the establishment of a relational database, BeefSys. The database contains birth-to-harvest histories for more than 6500 cattle, reproduction histories for over 900 cows, and documentation of long-term soil-pasture profiles from which modeling and economic decision aids may be formulated for stakeholders.

Development of Forage-Animal Intake & Performance Models

The team was first to publish a model that predicts the daily nutritive value of bermudagrass. A recent novel model is the Pasture Factor that uses forage allowance and nutritive value to estimate daily forage intake of stockers grazing bermudagrass.

TEXAS A&M AGRILIFE RESEARCH

Dr. Francis (Monte) Rouquette, Jr. serves as TAMUS Regents Fellow and Professor at the Texas A&M AgriLife Research and Extension Center at Overton. He has developed a novel research program that focuses on the soil-forage-animal interface for sustainable grazing systems to enhance livestock production. His program has recruited and involved collaborative team members from disciplines of Soil Science, Agronomy, Forage Breeding, Animal Nutrition, Animal Reproduction and Physiology, Animal Genetics and Breeding, Meat and Muscle Biology, Agricultural Economics, and Modeling.