



Phosphorous budget for cow-calf operations in Florida – Producer Survey Results

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A survey was developed in collaboration with the Florida Cattlemen’s Association to better understand typical management practices associated with cow-calf operations in the state. The survey is part of a larger ongoing project funded through the Florida Cattle Enhancement Board that is focused on understanding state-level phosphorus (P) balances and budgets in Florida. The survey consisted of 15 questions and was administered state-wide to cow-calf producers and land managers from April through July 2020. The survey is now closed. We thank all participants for taking the time to assist us with this survey. Your participation was greatly appreciated. This article provides a brief overview of the survey results. More detailed information will be forthcoming.

In addition to the survey, we are also currently gathering county-level N and P inventories data from different sources to calculate major P inputs and outputs in the state and understand the contribution of the cattle industry to the overall P budget. For instance, we are looking at N and P fertilizer use and human and livestock N and P demand to understand changes in farm and non-farm N and P fertilizer use in Florida. These data along with cattle export data provided by FDACS will be used to calculate county-level human and agricultural P inputs, surpluses, and nutrient use efficiency associated with cow-calf operations in Florida. Our team includes collaborators from various institutions (UF, USDA, and EPA scientists). Upon the completion of the project, we will publish our findings in relevant peer-reviewed journals.

Background/Rationale: Increased public concern has led to increased regulations for agricultural activities in Florida. Given the extensive acreage occupied by beef cattle in Florida, pastures are perceived as important contributors to P pollution and water quality problems. Currently, regulations are being proposed to further restrict P utilization (as inorganic fertilizer or other sources such as biosolids) while increasing regulation and monitoring of draining of water from farmlands to waterbodies. However, limited data exist on P budgets for low-input cow-calf systems. In addition, contradictory P budget estimates have previously been published. Calves produced in Florida are typically transported out of state to be finished, representing an output of P. The net balance of P depends on management practices utilized at the ranch scale.

Managing P inputs in Florida is complex due to current trends in land use. Changing land use patterns, especially urbanization and its potential impacts on water quality, are important issues that should receive attention in discussions related to water quality programs in Florida. Continued urbanization of South Florida's sensitive ecosystems may pose serious challenges to the success of water quality programs in the state. Thus, comprehensive state-level approaches that consider all the various P sources are necessary for the development of long-term alternative strategies to meet P loading goals.

SURVEY RESULTS

Characteristics of cow-calf operations

Geographic location: There were 57 anonymous respondents of the survey representing 32 counties in Florida.

Size of cow-calf operation: Ranch size ranged from 8 to ~ 300,000 acres (average size of 7,242 acres). Survey respondents represented ~ 398,286 acres of cultivated pastures and native rangelands. 33% of respondents also indicated they have other land uses such as citrus.

Herd size: Beef cattle herd ranged from 5 to 43,500 animals (average herd size of 1,143 animals). Total herd represented in this survey was 61,732 animals.

Stocking rate: Average stocking rate (acres/cow-calf pair) was 6 for cultivated pasture and 15 for native rangeland.

Marketing

The total number of calves sold per year reported in the survey was 40,024. On average, 19% of calves were retained as replacement heifers while 6% of the cow herd were sold as cull cows. Less than 9% of respondents indicated animals were purchased/brought from other states.

Most respondents (92%) indicated they sold less than 1000 calves per year, mainly to local markets (62% of respondents). Conversely, 7% of respondents indicated all calves were sold outside Florida (out of state buyers through private treaty or online action). Calves were shipped to Oklahoma, Texas, Colorado, Nebraska, Kansas, Alabama, Iowa, and Kentucky.

Nutrition

Most respondents (67%) indicated hay is produced on the ranch. On average, each operation produced ~ 5,633 tons of hay per year (range of 10 to 140,000 tons per year). 38% of respondents also buy hay (range of less than 1 ton to ~ 50 tons of hay per year).

Molasses (51%) and range cubes, such as alfalfa pellets or soybean hull cubes (38%) represented the most common supplement sources. Other sources also included grain by-products, soybean

hulls, cotton seed meal, dried distiller grains, and wet brew grain. Approximately one-third of the respondents utilize P-containing minerals/vitamins.

Forage Production and Management

The majority of the respondents (69%) indicated they produced hay or sod. Forage species included bahiagrass, limpograss, bermudagrass, and stargrass. Only 20% use annual forages. Species included annual ryegrass, pearl millet, sunn hemp, and deer vetch. None of the respondents utilize perennial legumes.

Fertilization: On average, ~ 30% of pastures and 75% of hayfields are fertilized. Of the pastures fertilized, 52% of the respondents use nitrogen only (average application rate of 50 to 60 lb N/A), while the remaining 48% use a complete (N-P-K) fertilizer mix. Less than 5% of respondents use organic fertilizer sources (i.e., biosolids, poultry litter, etc)

Half of respondents indicated pastures are fertilized every 3 to 5 years. The remaining 50% indicated pastures are either not fertilized or only once every 5-10 years. Most respondents (86%) indicated hayfields are fertilized every 3 to 5 years.

The majority (95%) indicated soil test results are used to determine frequency of lime application. On average, lime rates are 1 to 2 tons/acre.

Conclusions

The results from this survey account for ~ 7% of total beef cattle inventory in Florida (as of January 1, 2020), therefore caution should be exercised when attempting to generalize these results. Based on the results obtained in this study, P imports via fertilization and supplemental feed are considerably less than published reports. Reductions in P fertilizer recommendations and adoption of BMPs such as soil testing likely contributed to the decreases in P inputs. The majority of P exported was through sale of calves followed by cull cows. The next step of this project will be focused on estimating P balances (inputs – outputs). In addition, our team is also quantifying major P imports and exports at the state-level. These data will provide a better understanding of role that beef cattle industry plays in the overall P budget of the state of Florida. Once again, we are extremely grateful for those who contributed to this project. If you have any questions, please contact Maria Silveira at mlas@ufl.edu.