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Do Beef Cattle Contribute to Lake Okeechobee's Phosphorus Problem?

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Quantities of phosphorus entering Lake Okeechobee has been reduced in recent years, but levels have stabilized at about 100 tons above the annual target level. It is not known where this phosphorus is coming from, and efforts are being made to look at all possible sources, including beef cattle ranches.

To assess the potential of an agricultural enterprise to contribute nutrient load to ground and surface water many states use a nutrient balance procedure. This method calculates all inputs and outputs of a nutrient in question for a specific farm or ranch. The resulting analysis evaluates the 'sustainability' of the farm or ranch and provides an indication of the 'environmental risk' as related to the imbalance of nutrients like phosphorus or nitrogen.

Let us use this procedure to evaluate the phosphorus balance of a typical south Florida ranch. This ranch uses bahiagrass pasture, stocks pastures at 1 cow per 3 acres, provides 36.5 pounds of mineral annually containing 12% phosphorus, and feeds 5 pounds of liquid supplement per cow per day for 120 days containing 0.08% phosphorus. Following current University of Florida/IFAS recommendations, bahiagrass would not be fertilized with phosphorus. This ranch would sell 500 pounds calves from an 80% weaned calf crop and cull 15% of the cow herd annually.

Annual phosphorus inputs per acre are 1.5 pounds from mineral supplement and 0.2 pounds from liquid supplement for a total annual input of 1.7 pounds per acre. Annual phosphorus outputs per acre are 1.0 pounds from removal of feeder calves and 0.7 pounds from removal of cull cows for a total annual output of 1.7 pounds per acre. Thus the phosphorus balance of a typical south Florida beef cattle ranch is zero, a very 'sustainable' agricultural enterprise with a low 'environmental risk'.

Now let us evaluate past south Florida ranching practices that included phosphorus fertilization. Several surveys conducted by the South Florida Beef/Forage Extension Group during the 1980's and 1990's showed that cattlemen fertilized about 45% of their pastures annually with 25 pounds of P_2O_5 per acre. This equals to 4.5 pounds of phosphorus per acre annually which would also be 4.5 pounds above that removed by the sale of cattle. Is this 4.5 pounds per acre annual imbalance a large amount? Probably not when one considers that native phosphorus in the top soil and hardpan of south Florida soils exceeds 500 pounds per acre.

Florida cattlemen need to make every effort possible to prevent nutrient movement into our waters through sound, economical management practices. Also, Florida cattlemen need to be more proactive, emphasizing that their ranches are 'sustainable' enterprises with a low 'environmental risk' relative to nutrients, pesticides, or any hazardous substance. Ranches are not major contributors to phosphorus contamination of Florida's ground and surface waters. Florida agriculture is proving to be a major part of the solution to Florida's environmental problems created by an ever increasing human population with fewer places to dispose of urban wastes.