

## **Narrative**

### **Background:**

An excess of 1,000 people move to Florida each day, many choosing to put roots in centralized Marion County; where prime agriculture real estate meets a growing urban core. The county services much of the states' freshwater with three first magnitude springs within county lines. The Florida Department of Environmental Protection studies suggest nutrients leaching from agriculture, more specifically equine operations in Marion County account for nearly 18% and 9% of the Nitrogen load in the Rainbow Springs and Silver Springs Basins respectively. This leaching is largely due to mishandling of equine manure and fertilizer inputs to horse pastures. Providing education and outreach to the equine sector of the agriculture industry in Marion County is paramount for continued growth and maintaining the highest standard for quality of life for Marion County citizens; both rural and urban populations. UF/IFAS Extension in Marion County has developed programmatic expertise in the area of equine farm management. The ultimate goal being adoption of Best Management Practices (BMP) related to manure and pasture management on horse farms which are science-based management practices that work to minimize water quality impairment.

### **Educational Objectives:**

- To raise awareness of the science behind Best Management Practices recommendations to horse farm owners.
- To familiarize farm owners with partner agencies that are vested in the BMP program.
- To encourage practice change in the areas of equine BMPs, specifically manure management and pasture management in order to reduce runoff of nutrients to nearby waterways.
- To increase the number of farms enrolled in the state BMP program to reflect compliance with environmental standards set forth by stakeholders.

### **Program Activities:**

Since 2018, one on-farm manure management research study was conducted in Marion County that worked directly with local clientele and resulted in two field days with hands-on learning experiences. One grant-funded BMP demonstration project was constructed on a local equine show facility, to display a compost bin system that could be effective on small to medium-sized farms. Two field days were held at this demonstration site, which included topics on pasture and manure BMPs for horse farms. Ten additional equine BMP talks with emphasis on manure composting and pasture management topics such as soil testing, fertilization, and grazing management have been given at various extension programs from 2018-2020. One program was a stakeholder tour to two local equine facilities that were composting manure on a large-scale which hoped to highlight the efforts of the commercial equine industry in adopting BMPs. This event paved the way for local cost-share programs to encourage additional large-scale operations to adopt

composting as a manure management strategy. In addition to educational lectures and on-farm tours, two manure management videos were made to highlight the importance of BMP adoption on horse farms and how to compost manure using proven methods. These videos have over 10,000 views, collectively, being shared on social media sites.

### **Teaching Methods:**

Applied field demonstrations are one of the most effective means of practice change in the equine community. Use of compost demonstration systems on working horse farms allow farm owners to see how this system can work in real time and hear first-hand from farm owners like themselves what they can expect from a management and cost standpoint. Classroom lectures and online learning were used as means to convey technical knowledge about BMPs, how to adopt them on a case-by-case basis, and the impacts they have on agriculture industries moving forward. An important aspect to the success of this program has been the inclusion factor. Meaning, all state partner agencies with environmental quality and natural resource responsibility as well as agriculture stakeholders were invited to participate during these events. The adoption of Best Management Practices is now mandatory on all farms within an environmentally sensitive area in Florida, which comes with some heart burn and confusion from many farm owners. These programs allowed participants to mingle with regulatory and non-regulatory entities to understand what each organization's objectives were and how everyone can work towards a common goal of improved water quality for the greater good of our communities. Stakeholders in regular attendance other than Extension personnel included representation from the local water management districts, Florida Department of Agriculture, county government, and the Florida Department of Environmental Protection. Additional teaching materials created included fact sheets, weekly compost management guides, BMP farm check lists, and trade journal articles.

### **Results:**

This effort had a total participation of 648 people from 2018-2020. Specific results were as follows:  
N=445

- 95% increase in awareness of equine BMPs.
- 62% adoption of at least one pasture or manure management strategy.
- 41% adoption of an environmentally sound manure management plan.
- 8 farms totaling over 2,200 acres enrolled in the state BMP program.

**Impacts:**

By quantifying the impact that different manure management practices have on freshwater systems, Extension agents will be better able to make science-based recommendations for proper manure handling. Adoption of BMPs will ensure water quality and natural resources are maintained at a high standard. Reducing the amount of nutrients reaching surface and ground water sources via leachate and runoff from agriculture, specifically, nitrogen, will allow the Upper Floridan Aquifer to service the growing population of Marion County and Florida while also maintaining the agriculture industries of Florida. Providing horse farms with alternate means of managing their equine waste stream and education on properly applying nutrients in the form of fertilizer in accordance with UF/IFAS recommendations as well as enhanced pasture management will reduce overall nitrogen inputs from the largest agricultural contributor in Marion County.

The Rainbow springs and Silver Springs river basin of Marion County requires an 82% and 66% reduction in nitrates, respectively, to maintain its quality for drinking water. Providing horse farms with alternate means of managing their equine waste stream (responsible for 18% and 9% of total nitrate loads in each of those basins) and education on properly applying nutrients in the form of fertilizer in accordance with UF/IFAS recommendations will reduce overall nitrogen inputs from the largest agricultural contributor in Marion County.

**Evaluation:**

Evaluation methods include post program surveys, pre- and post-testing, as well as individual contact to verify practice change. The program surveys allowed self-reporting of knowledge gain as well as overall awareness change in the subject matter. Individual contacts included office, phone, and email consultation as well as farm visits to individual sites. Working in coordination with Florida Department of Agriculture field staff that manage enrollment in the BMP program has helped track acreage enrolled as well as any challenges keeping farms from enrolling and where Extension can provide educational resources to break these barriers.