SS-AGR-20

UF UNIVERSITY of FLORIDA
IFAS Extension

The Role of Livestock in Integrated Peanut/Cotton Cropping System-Economics[1]

T. W. Katsvairo, D. L. Wright, J. J. Marois, D. Hartzog, P. J. Wiatrak and J. R. Rich [2]

The very first cattle in the U.S. were brought to Florida in 1513 by Ponce de Leon. Over the years, the role of cattle in agriculture has changed several times from subsistence mixed farming, where farmers kept both cattle and crops, to specialization, where for some farmers, cattle production became their sole agriculture business. The current economic situation and environmental and wildlife concerns favor the integration of livestock into peanut/cotton farming systems as well as other row crops. From research results, a four-year cropping system is proposed which includes two years of bahiagrass, followed by peanut and then cotton in place of the traditional peanut/cotton rotation. An overview of this farming system is given in IFAS/EDIS publication SS-AGR-126 *Sod/Livestock based Peanut/Cotton Production Systems: Why We Recommend It!* (http://edis.ifas.ufl.edu/AG258) and also on our website at http://nfrec.ifas.ufl.edu/programs/sod_rotation.shtml.

Row crop growers stand to reap several benefits when they include cattle in their farming systems. In the course of grazing, cattle reduce chances of forest fires, control weeds, and make use of plants that cannot be digested by humans, i.e. from low-energy grass to high-protein beef or milk. Livestock provides a fallback alternative for utilization of crops when grain quality or quantity is not good enough to be sold or harvested. In the case of the proposed livestock integrated peanut/cotton cropping system, bahiagrass can be baled and fed to the cattle, or alternatively, the cattle can graze on the bahiagrass. Livestock fit well with the already existing cover crop system and can graze on the winter small grain crops. In winter, small grain crops could potentially be grown on land which would be used for peanuts and cotton in summer. This would enable farmers to achieve higher carrying capacity and more intensive summer and winter grazing increases income to be obtained from livestock. Livestock manure provides nutrients and other beneficial properties important to soil quality and plant growth. Livestock manure can increase soil organic matter content, and manure and urine can also raise the pH level. Cattle also recycle N which can reduce N application while maintaining plant growth.

1. This document is SS-AGR-20, one of a series of the Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date July 2006. Reviewed August 2009. Visit the EDIS Web Site at http://edis.ifas.ufl.edu.

2. T. W. Katsvairo, crop and soil scientist; D. L. Wright, professor; J. J. Marois, professor; D. Hartzog, professor, Auburn University; P. J. Wiatrak, agronomist; and J. R. Rich, professor; North Florida Research and Education Center--Quincy, FL; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

Expansion and intensification of agriculture and associated tillage has robbed wildlife habitat and reduced plant and animal biodiversity and numbers. It is necessarily for humans to co-habit with wildlife if we are going to preserve wildlife for future generations. Many animal species including ground nesting birds, deer, wild turkey, quail and rabbits all live in close proximity to humans. Diverse cropping systems result in diverse plants which are likely to attract insects, which will in turn attract birds. Introducing pastures in the traditional row crop increases plant species composition and wildlife habitat.

Economics of the Crop/Livestock Farming System

Cotton and peanut yields have not increased much over the past 15-25 years, while the cost of production has continued to rise. Thus it is not surprising that many row crop growers have found it difficult to remain financially viable and hence have sold their land or planted pine. Our research and research across the country has shown that incorporating livestock into the traditional peanut/cotton or other row crop rotations greatly increases the profitability for farmers. We have an interactive business model which growers can use to evaluate the economic feasibility of a four year livestock/peanut/cotton/sod rotation for their own farms. The model can be found at http://nfrec.ifas.ufl.edu/programs/sod_rotation.shtml. Farmers can input values for their farm scenarios and find how the system works for them. Generally results from the model show low net returns at the beginning of the integrated farming system compared to the traditional peanut/cotton rotation. However, returns quickly jump up and can be 2 - 6 fold in year 3 and by year 4, can be 3-7 fold greater compared to the conventional peanut/cotton rotation (Table 1). The low profits at the beginning of the rotation are a result of establishment costs with bahiagrass. The greater returns in years 3 and 4 are from the cattle revenue and greater returns from crops with higher yields. Even if the grower does not have cattle but adopted the sod rotation, the sod-based rotation would still be more profitable than the conventional peanut/cotton rotation, because of the higher crop yields from the rotation. As pointed out earlier, bahiagrass hay or seed can be sold for income. Many of the small row crop farmers in Florida have small cattle herds, and they may buy hay from their neighbors. Likewise, farmers who may not want to invest in cattle can still incorporate livestock into their rotations through contract grazing. Thus, they gain the advantages of integrated farming without actually owning cattle.

Conclusion

An integrated sod/livestock based peanut/cotton farming system adds value above the traditional peanut/cotton rotation. This system increases yield, profitability and allows for wildlife proliferation. While the integration of crop and livestock systems is challenging as it requires new knowledge and greater management skills, the potential rewarding returns from this systems should make farmers willing to learn to manage cattle. Complete details on the sod rotation including the effect on plant and soil health, weeds, diseases, pests and yield are also available on our Web site http://nfrec.ifas.ufl.edu/programs/sod_rotation.shtml and also in our other publications on the EDIS Web site (http://edis.ifas.ufl.edu/).

Table 1. Cost, returns and profits for the conventional compared to the livestock based peanut/cotton cropping system.

Enterprise	Yield/Acre	Units	Area	Cost ($)	Returns ($)	Profits ($)
Conventional peanut and cotton rotation						
Peanut	2504	lbs	67	30531	25000	2719
Cotton	650	lbs	67	28163	29393	1230
Cotton	650	lbs	67	28163	29393	1230
Total			**200**	**86857**	**83786**	**5179**
First year in sod rotation						
Peanut	2504	lbs	50	22956	25000	2044
Cotton	650	lbs	50	21175	22100	925
Bahia 1	2	tons	50	12935	10000	-2935
Cotton	650	lbs	50	21175	22100	925
Total			**200**	**78241**	**79200**	**959**
Second year in sod rotation						
Peanut	2504	lbs	50	22956	25000	2044
Cattle	68	head	50	24301	37500	13199
Bahia 1	2	tons	50	12935	10000	-2935
Cotton	650	lbs	50	21175	22100	925
Total			**200**	**81367**	**94600**	**13233**
Third year in sod rotation						
Peanut	3757	lbs	50	22956	33150	10269
Cattle	68	head	50	24301	37500	13199
Bahia 1	2	tons	50	12935	10000	-2935
Cotton	650	lbs	50	21175	22100	925
Total			**200**	**81367**	**102750**	**21458**
Fourth year in sod rotation						
Peanut	3757	lbs	50	22956	33150	10269
Cattle	68	head	50	24301	37500	13199
Bahia 1	2	tons	50	12935	10000	-2935
Cotton	650	lbs	50	21175	33150	10269
Total			**200**	**81367**	**113800**	**30802**