

Introduction

The Food and Agriculture Organization estimates that by 2030 beef and dairy consumption in high income countries, like the United States, will increase by 15% and 31% respectively.

Expanding the production livestock within the country will be necessary to meet future needs, but it will have negative effects on the environment.

It's important to find ways of expanding the production of livestock without causing further deterioration of the environment.

Florida's Cattle Industry

Florida is one of the nation's major producers of cattle, with:

- Over 231 million pounds of beef, contributing \$475 million to Florida cash receipts.
- Over 2.3 million pounds of milk, contributing \$513 million to Florida cash receipts.

Cattle industry is an important part of Florida's economy.

- We can expect it to grow as meat and dairy consumption increases nationwide.

However, this industry already causes concerns over its environmental impact.

- N and P runoff from cattle operations has led to nutrient enrichment and eutrophication in Florida's surface waters.
- Florida ranks 6th in the USA for total greenhouse gas emissions, with increasing amounts of atmospheric CO2 emissions being recorded yearly.



Bennet, Z. (2019). Cattle walk and eat at Archbold Biological Station's Buck Island Ranch in Venus, Florida. [Photograph]. Tampa Bay Times. <https://www.tampabay.com/news/environment/2020/06/08/why-floridas-toxic-algae-crisis-is-worse-than-people-realize/>

Hypothesis

Silvopastures, which integrate forestry, pastures, and grazing livestock on the same land, are a more environmentally sustainable way to increase cattle production in Florida.



Mayo, D. (2015). *Silvopasture is an agricultural practice co-managing trees, forage, and livestock.* [Photograph]. UF/IFAS Extension. <https://nwdistrict.ifas.ufl.edu/phag/2015/01/30/converting-planted-pine-to-silvopasture-benefits-cattle-timber/>

Florida Species for Silvopasture

Trees:

Species	Soil Tolerances	Pruning Requirements	Disease Resistance	Production (Chip and Saw)
Longleaf Pine	Dry, sandy soils.	Low	Very High	30-45 years
Slash Pine	Low-lying, well-drained areas.	Low	Very Low	22-35 years
Loblolly Pine	Upland, well-drained areas or clay soils.	High	Low	22-35 years

Pastures:

Species	Season	Soil Tolerances	Fertilization Requirements	Productivity
Bahiagrass	Warm	Dry, sandy soils	Low	1.5 to 5 tons/acre
Bermudagrass	Warm	Well-drained, sandy soils.	High	4 to 7 tons/acre
Oat	Cool	Dry, sandy soils.	Mid	2.5 to 3.8 tons/acre
White Clover	Cool	Well-drained, organic soils.	High	1 to 2 tons/acre
Rhizoma Peanut	Warm & Cool	Well-drained, sandy soils.	Low	3 to 6 tons/acre
Limpograss	Warm & Cool	Wet, organic soils.	Mid	8 to 10 tons/acre

Benefits

Diversified farm outputs and income:

- Cattle production in woodlands or tree plantations will create income prior to the harvest of timber.
- Timber production in a cattle operation will provide supplemental (long-term) income for the farmers.

Increased tree growth:

- Wider tree spacing means less competition and greater timber yields.

Decreased fertilizer needs:

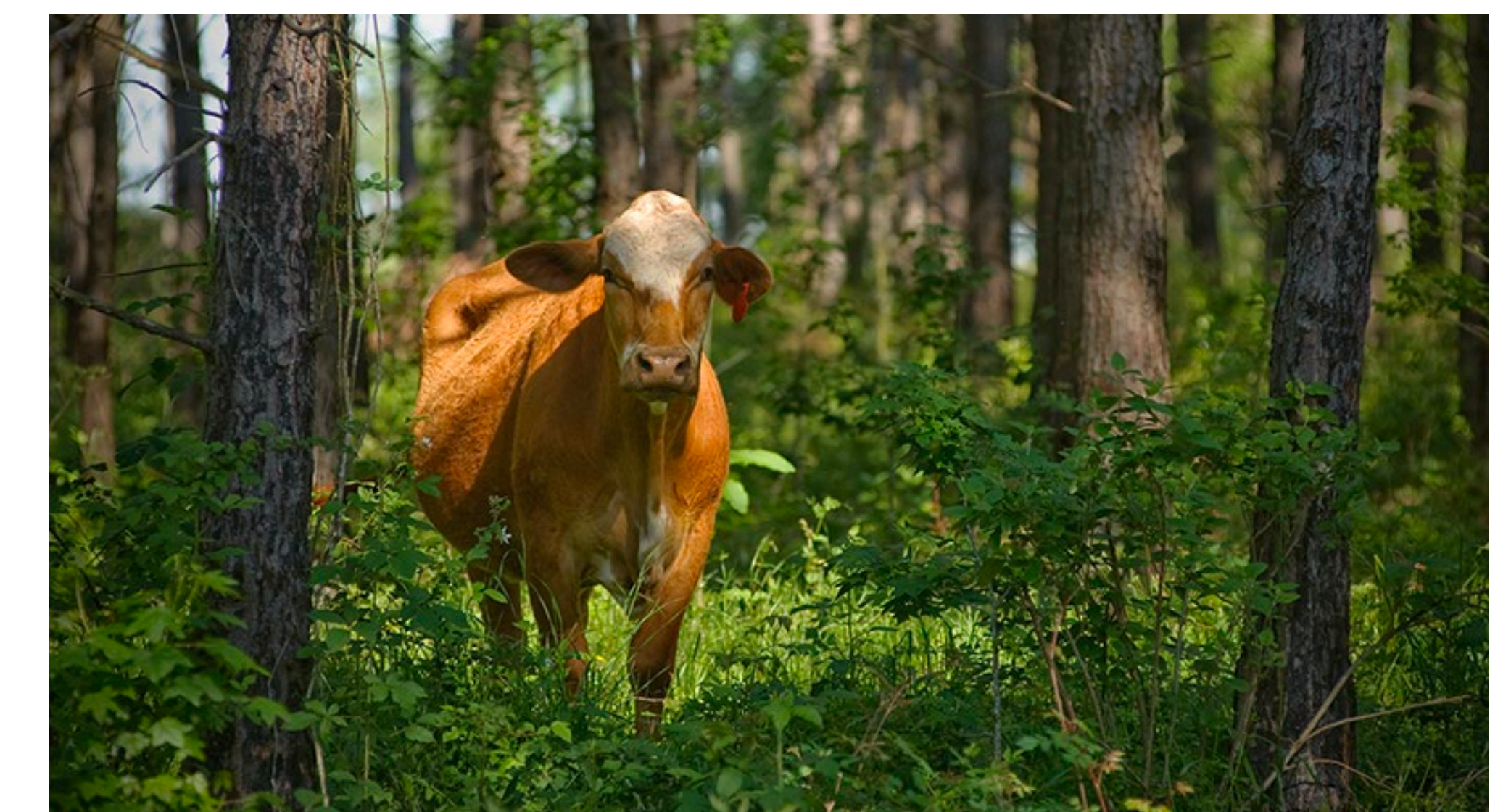
- N-fixing species (such as Rhizoma peanut and white clover) and animal manure will minimize fertilizer inputs.
- Reduced fertilizer applications will decrease nutrient runoff.

Improve overall cattle performance:

- Shelter provided by trees will improve animal performance during hot or cold periods.
- High branching pines, especially Loblolly Pine, will be useful in Florida's hot, rainy climate.

Increased carbon sequestering:

- Higher aboveground and root biomass produced (from trees and pastures) will allow for higher carbon storage.



California State University. (n.d). *Silvopasture.* [Photograph]. <https://www.csuchico.edu/regenerativeagriculture/ra101-section/silvopasture.shtml>

Conclusion

- Cattle production is an important part of Florida's economy, and will continue to grow as the meat and dairy consumption increases.
- Silvopastural systems will allow for a more sustainable intensification of cattle production.
- Well-managed silvopastural systems will provide farmers with increased short and long-term income, while decreasing inputs and negative environmental effects.