



**Science
Societies**

Management and productivity of corn–alfalfa intercropping systems in the southeastern United States

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Photo not from the current study. Photo by Will Osterholz (originally published in CSA News magazine <https://www.sciencesocieties.org/publications/csa->



Corn is widely grown for livestock feed in the southeastern United States, but low protein and sensitivity to heat and drought can limit its productivity.

Alfalfa provides high-protein forage, and warm-season grasses like

crabgrass may help maintain growth

during stressful summers. This two-year study evaluated corn, alfalfa, and crabgrass mixtures for forage growth, quality, and corn silage yield.

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1. What was the primary objective of this study?

- a. To evaluate forage productivity, quality, and corn silage yield under different fertilization programs.
- b. To compare forage productivity, quality, and cattle performance in annual grazing systems.
- c. To evaluate forage productivity, botanical composition, quality, and corn silage yield in corn–alfalfa intercropping systems.
- d. To assess forage productivity, quality, and stand persistence under different alfalfa establishment methods.

2. Which four cropping systems were compared in the experiment?

- a. Corn, soybean, alfalfa, and bermudagrass.
- b. Alfalfa alone, corn alone, alfalfa + corn, and alfalfa + crabgrass + corn.
- c. Corn alone, corn + ryegrass, corn + clover, and soybean.
- d. Alfalfa alone, crabgrass alone, corn alone, and bermudagrass.

3. Where was the study conducted?

- a. Knoxville, TN.
- b. Athens, GA.
- c. Spring Hill, TN.
- d. Lexington, KY.

4. What experimental design was used?

- a. Split–plot design with three replications.
- b. Latin square design.

- c. Completely randomized design.
- d. Randomized complete block design with four replications.

5. Which forage species was included to help maintain productivity during hot, dry conditions?

- a. Bermudagrass.
- b. Annual ryegrass.
- c. Crabgrass.
- d. Tall fescue.

6. What was the seeding rate used for alfalfa establishment?

- a. 10 lb pure live seed/acre.
- b. 15 lb pure live seed/acre.
- c. 20 lb pure live seed/acre.
- d. 30 lb pure live seed/acre.

7. How did total herbage mass respond to treatment?

- a. It was greatest in ACC every year.
- b. It was influenced by year but not by treatment.
- c. It was greatest in corn monoculture.
- d. It declined equally across all systems.

8. Which treatment showed the greatest decline in alfalfa proportion by 2024?

- a. AA.
- b. AC.

c. ACC.

d. CA.

9. **Nitrogen fertilizer was applied to corn during both years of the study.**

a. True.

b. False.

10. **What happened to crude protein concentration as alfalfa persistence declined?**

a. It increased substantially.

b. It remained unchanged.

c. It disappeared completely.

d. It generally decreased.

11. **Which treatment had the greatest neutral detergent fiber digestibility (NDFd)?**

a. AA.

b. AC.

c. ACC.

d. CA.

12. **In 2023, which treatment produced the highest corn silage yield?**

a. Corn alone (CA).

b. Alfalfa + corn (AC).

c. Alfalfa + crabgrass + corn (ACC).

d. All treatments were equal.

13. **Why were corn silage yields much lower in 2024?**

- a. Excess nitrogen fertilization reduced growth.
- b. Poor seed quality reduced emergence.
- c. Reduced soil moisture and a drier growing season limited productivity.
- d. Corn was planted later than recommended.

14. **Which laboratory technique was used to evaluate forage nutritive value?**

- a. Gas chromatography.
- b. Near-infrared reflectance spectroscopy (NIRS).
- c. High-performance liquid chromatography.
- d. Kjeldahl digestion only.

15. **Which conclusion best summarizes the study?**

- a. Intercropping consistently increased corn silage yield and improved forage quality across all years.
- b. Alfalfa persistence and forage productivity improved as stands aged over time.
- c. Corn monoculture produced the highest forage quality and greatest overall productivity.
- d. Crabgrass helped maintain forage quality, but weather had a greater influence on productivity than intercropping system.

This quiz was drafted with AI assistance and reviewed by the editorial team for accuracy and appropriateness.

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