

Get to know: **Alley Cropping**

What is alley cropping?

Alley cropping is an agroforestry practice defined by the U.S. Department of Agriculture (USDA) as “the planting of rows of trees and/or shrubs to create alleys within which agricultural or horticultural crops are produced.” Like other agroforestry systems, the roots of alley cropping techniques likely predate what many consider the dawn of modern agriculture. By revisiting and reimagining these practices, today’s land stewards can conserve and enrich natural resources while diversifying their income streams.



An example of an alley cropping site. Credit: Tracey Coulter, Pennsylvania Department of Conservation and Natural Resources

What forms might alley cropping take?

- **Planting rows of trees and/or shrubs to create “alleys” in which annual crops are grown is the most common application of alley cropping principles on farms today.** Adding trees and shrubs to annual crop systems can reduce wind and soil erosion, mitigate flooding, improve soil, sequester carbon, and diversify farm income. Challenges often include increases in farm management complexity, and loss of income over the short term.
- **Another approach is to incorporate annual crops in existing alleys in orchards.** Advantages include income and ecosystem diversification, as well as increased profit. However, farm management will become more complex. Increases in management complexity should correlate with increases in productivity, both ecological and economic.
- **Alley cropping might also involve the production of animal forage, such as hay, between rows of trees or shrubs.** If these alleys were to be grazed

by livestock, this would be considered *silvopasture*, a practice classified separately by the USDA within the spectrum of agroforestry. As of 2022, alley cropping is a practice that's currently eligible for state funding support in Pennsylvania; silvopasture is currently not eligible for state funding support. For the most current information on agroforestry funding programs, contact your state's USDA Natural Resource Conservation Service office.

What's the most appropriate scale for an alley cropping system?

Alley cropping techniques can be applied to farms small and large. The management complexity and horticultural diversity of alley cropping systems may require farmers to make changes to their existing mechanical equipment and may require new training for farmworkers.

What are the financial benefits?

The financial benefits of an alley cropping system are measured by the goals of each individual farm. Farmers must determine whether the ancillary benefits of alley cropping—such as windbreaks and erosion control—are worth the increase in management complexity and loss of annual cropland area. If the prime motivation for a farm manager is short-term profit, based on a year-to-year view these systems are likely to disappoint. But in a changing climate, with natural resources at an increasing premium, farms willing to invest in perennial scaffolds for annual systems could realize not just long-term payment on their investment, but greater production overall.

What should a farmer consider when designing an alley cropping system?

- **Is the land secure?** Alley cropping systems typically require years to mature and realize profitability; therefore, these systems may not be suitable to implement on leased land unless a long-term arrangement is in place.
- **What are the goals for the system?** (increase income, increase biodiversity, etc.)
- **What are the site conditions?** (soil type, water table, slope, sunlight, etc.)
- **Given the site conditions and goals, what plants could work?** (moisture needs, shade regimes, spacing requirements, rooting profiles, etc.)
- **How will the system be managed, and can the design accommodate this work?** For instance, if large equipment is needed, are the alleys wide enough for tractors?
- **How will the system deal with potential pests?** (deer, voles, birds, etc.)
- **How will the system evolve over time?** Alley cropping systems aren't static, and the design and management of them will often need to change as trees grow and alter both light and moisture regimes.

Learn about real examples of alley cropping on working farms.

Read case studies about farms in Pennsylvania that are working to incorporate alley cropping into their operation by scanning the **QR code** or visiting pasafarming.org/alley-cropping-case-studies.



Funding for this project was provided by a state Conservation Innovation Grant awarded by the Pennsylvania office of the Natural Resource Conservation Service.