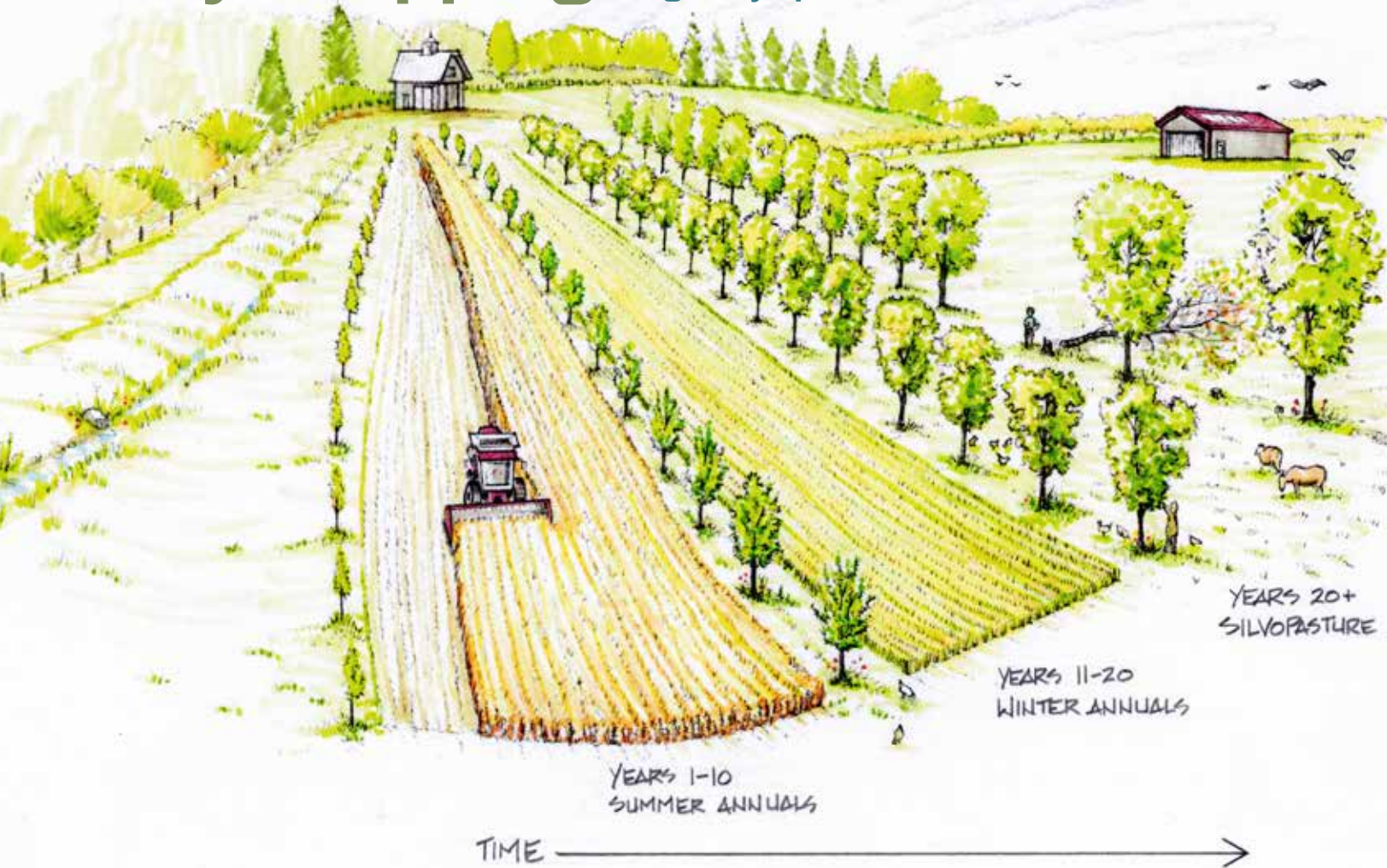




## Alley Cropping

The cultivation of crops in the alleys between regularly spaced rows of trees or shrubs.



## BENEFITS

### Economic

**INCOME STABILITY** through diversified revenue streams from trees and crops.

**HIGHER LAND-USE EFFICIENCY:** Tree roots capture nutrients that crops cannot access, thereby increasing the productive potential of the land.

**CROP YIELD STABILITY:** Trees reduce wind stress on crops, stabilize crop temperatures, and reduce evaporation of water from soil.

### Ecological

**CARBON SEQUESTRATION** in woody perennials and soil organic matter.

**SOIL HEALTH AND FERTILITY:** Trees reduce soil erosion, nutrient leaching, soil compaction, and water runoff.

**PEST AND DISEASE SUPPRESSION:** Perennial crop structural diversity provides habitat for natural enemies.

**POLLINATOR AND WILDLIFE HABITAT** via structural diversity and uncropped area within tree rows.

## CHALLENGES

**INCREASED COMPLEXITY** of management interventions and required farmer skill set.

**CHANGING ALLEY CROP OVER TIME** as tree-crop competition increases.

**HIGH CAPITAL INVESTMENT** in initial tree and shrub establishment.

**LONG-TERM LAND TENURE** required to realize the full profitability/benefits of trees.

# PUTTING IT INTO PRACTICE



## Frequently Asked Questions

### WHAT TREES/SHRUBS TO PLANT?

Timber trees require low capital investment and minimal ongoing maintenance. Fruit and nut trees require higher investment and maintenance, but can provide higher, earlier, and annual returns.

Additional shrubs/other perennial crops can be planted within the tree rows between the primary trees. Since mechanical harvest is difficult between trees, this area should focus on hand-harvestable species (e.g. elderberry, red currants, decorative stems/flowers).

Since mechanical harvest is difficult within tree rows, this area should focus on hand-harvestable species (e.g. elderberry, red currants, decorative stems/flowers).

### WHAT CROPS TO GROW?

The alley crop will change over time to optimize productivity during different phases of tree maturity. For example:

YEARS 1-10: Sun-loving summer annuals (corn, soybean, vegetables)

YEARS 11-20: Winter annuals with a growing season complementary to the trees (wheat, barley, oats)

YEARS 20+: Crops with deep roots and shade tolerance (forages, shrub fruits), with possible transition to a silvopasture system.

### MECHANICAL HARVEST?

Systems dimensions are designed to allow standard mechanical crop management. Mechanical harvest of trees (nuts, fruits, timber) can be completed after crop harvest.

### PLANTING DIMENSIONS?

**ALLEY WIDTH** between tree rows is typically a multiple of the width of the alley crop farmer's widest implement.

**WITHIN-ROW TREE SPACING** depends on the mature canopy size of trees.

**UNCROPPED AREA** within tree rows is kept as narrow as possible while still permitting access for periodic maintenance.

### FUNDING AND PLANNING ASSISTANCE?

Connect with the local conservation district and extension offices to learn about federal and state cost-share programs such as EQIP, CRP, and CSP. These offices can also provide connections with regional consultants and technical service providers.

*The Savanna Institute is a 501(c)(3) nonprofit organization working to catalyze the development of and adoption of resilient, scalable agroforestry in the Midwest US. We work in collaboration with farmers and scientists to develop perennial food and fodder crops within multifunctional systems grounded in ecology and inspired by the savanna biome. The Savanna Institute strategically enacts this mission via research, education, and outreach.*



This product was developed with support from the Sustainable Agriculture Research and Education (SARE) program, which is funded by the U.S. Department of Agriculture-National Institute of Food and Agriculture (USDA-NIFA). Any opinions, findings, conclusions or recommendations expressed within do not necessarily reflect the view of the SARE program or the U.S. Department of Agriculture. USDA is an equal opportunity employer.