

Info

How can agroforestry help landowners adapt to climate change?

Working Trees



Farmers, ranchers, and forest landowners always face challenges posed by weather and these challenges are getting more frequent and extreme. Agroforestry practices provide many benefits including improving yields; protecting soil, air, and water quality; providing wildlife habitat; diversifying income; and sequestering greenhouse gases. But agroforestry can also help landowners prepare for and respond to the risks that come from a changing climate.

the USDA Climate Hub in your region or local NRCS office.

Agroforestry systems need to be developed now to perform an adaptation function in the future. Agroforestry practices can provide benefits that reach beyond the trees. For example, conservation buffers in riparian areas and other parts of the landscape can reduce flood and erosion risks for downstream farms and communities by slowing runoff and stabilizing stream banks. Additionally, riparian forest buffer

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The severity of climate risks depends on location, the type of farming or land management practiced, and the adaptation measures put in place. To prepare and respond, landowners should assess their land's risk to weather variability and long term climate change impacts. Then they should consider which actions may help create a more resilient farm. Information about regional climate risks and potential adaptation strategies can be found by contacting your local university cooperative extension office,

shade can maintain cold-water fish habitat in areas where stream temperatures may rise.

While agroforestry practices help landowners adapt, plant materials used in agroforestry systems are also at risk from climate change. When choosing plant species for agroforestry practices, consider the suitability of the species based on anticipated changes in temperature, precipitation and extreme weather, as well as potential insect, weed and disease pressures. Plant diversity is often the best hedge against climate change effects.

Examples of some risks that landowners may face due to climate change and how agroforestry practices might be used to adapt to those risks.

	Risk	Adaptation	Agroforestry Practice
	Intense precipitation events	Slow water runoff to reduce flooding, soil erosion, and water pollution	Riparian forest buffers; alley cropping
	Increased temperatures	Reduce heat stress on animals by providing shade	Silvopasture
	Increased frequency and intensity of drought	Reduce evapotranspiration by reducing windspeed	Windbreaks
	Increased storm intensity (wind & precipitation)	Protect crops from wind damage	Windbreaks; alley cropping
	Changes in growing season due to temperature and precipitation	Protect crops by creating microclimates	Windbreaks; alley cropping; forest farming
	Winter storms and cold temperature extremes	Reduce cold stress on animals by providing shelter	Silvopasture; windbreaks
	Increased insect and disease problems	Control pests by providing habitat for beneficial insects	Windbreaks; riparian forest buffers; alley cropping
	Increased possibility of crop failure due to other risks	Reduce total crop loss by increasing crop diversity.	All agroforestry practices

Agroforestry and climate change related resources:

- ▶ For more information on agroforestry: USDA National Agroforestry Center: <http://nac.unl.edu/issues/climatechange.htm>
- ▶ For regional information on climate risks: USDA Climate Hubs: <http://climatehubs.ocs.usda.gov/>
- ▶ For information specific to forestry and climate change, the Northern Forests Sub Hub: <http://climatehubs.ocs.usda.gov/northernforests>
- ▶ NRCS climate change resources: <http://1.usa.gov/1llo1aJ>
- ▶ The Northern Institute of Applied Climate Science Adaptation Workbook: <http://www.adaptationworkbook.org/>
- ▶ Branching out: Agroforestry as a climate change mitigation and adaptation tool for agriculture: <http://bit.ly/1UopO4d>



A partnership between:
United States Forest Service
Natural Resources Conservation Service

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The USDA National Agroforestry Center (NAC) is a partnership of the Forest Service (Research & Development and State & Private Forestry) and the Natural Resources Conservation Service. NAC's staff is located at the University of Nebraska, Lincoln, NE. NAC's purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land use systems by working with a national network of partners and cooperators to conduct research, develop technologies and tools, establish demonstrations, and provide useful information to natural resource professionals.

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