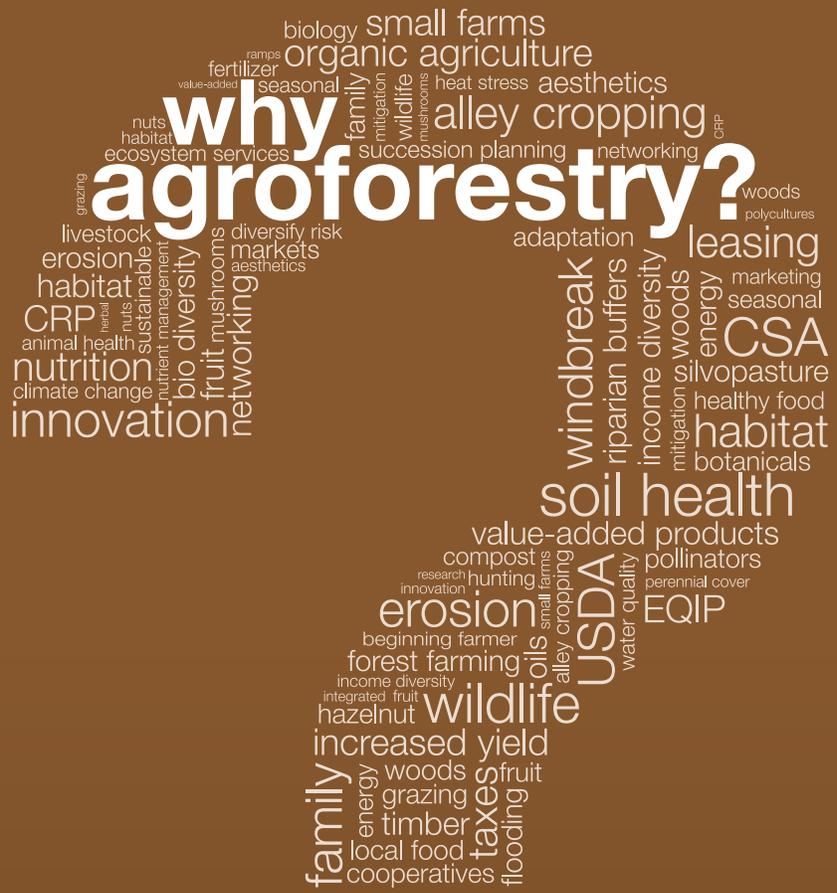


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Inside Agroforestry

VOLUME 25 ISSUE 1



Part II

pg. **2** New Ways for Old Terrain

pg. **8** Agroforestry for New Farmers



NAC Director's Corner

A commentary on the status of agroforestry by Susan Stein, NAC Director

As we searched for stories on the topic of "Why Agroforestry?" for Inside Agroforestry, we heard so many insightful experiences and perspectives that we decided to create two issues. This is our second issue on this important topic. We are fascinated and excited by the range of reasons voiced by landowners, researchers, educators, and practitioners for their involvement in agroforestry.

Each contributor to the two "Why Agroforestry?" issues has described economic, environmental, and/or social reasons for integrating trees with agriculture. Each has also provided helpful insights into potential risks, tradeoffs, and

opportunities associated with adding agroforestry practices into agriculture, forestry or livestock management.

Like our first issue, this one provides a variety of perspectives and experiences on a range of agroforestry practices including forest farming, alley cropping, silvopasture, and riparian forest buffers. While for some landowners agroforestry was an important step in protecting or diversifying production on existing farm operations, others have integrated trees with agriculture from the very beginning.

We are thankful for each of these stories, shared by producers, researchers, and others, and hope that you will share them further, with colleagues, neighbors, and clients.

Rosmann Family Farms: Combining Windbreaks, Organic Practices, and Pollinators

Richard Straight, USDA National Agroforestry Center

"I guess I've always been a tree lover. I remember having trees as a 4H project. I even thought about forestry when I went to college," says Ron Rosmann of Harlan, Iowa. The Rosmann Family Farm has been certified organic since 1994. Their beef operation was certified organic in 1998 and their pork production has been certified organic since 2004.

The family has been planting and managing windbreaks since 1983. "We planted about 100 pine and spruce trees on the top side of a bench terrace in 1983. Then in 1993 we started planting trees on a longer terrace. I suppose now we have about 12 to 15 acres of tree and shrub buffers on the 700 acre farm" says Rosmann.

Most of the Rosmann windbreaks serve one of three purposes. The top of the bench terraces provide protection for livestock

grazing in pastures on the lower side of the terraces. "Our new calves really like those areas protected by the windbreaks. When we add those pollinator friendly shrubs on the back side of the terraces we are going to install permanent fences in the pastures where we calve out. Those calves really like to sneak up into the pines and spruces. And it is really tough to get them back out."

Another purpose for their windbreaks is to buffer neighboring non-organic farmland. "In 2007 we started planting 35 foot wide tree buffers near our neighbors. We planted quite a variety of species including black cherry, white spruce, and concolor fir. The deer were too hard on red oak and the hawthorn didn't seem to have the survival rate I wanted," says Ron.

Continued on Page 11



➤ Rosmann uses windbreaks to provide protection for livestock. Photo by Ron Rossmann.



➤ Windbreaks also serve as a buffer between Rosmann's organic farmland and neighboring non-organic farmland. Photo by Ron Rossmann.

New Ways for Old Terrain

Diomy Zamora, University of Minnesota Extension

There's an old saying that it is hard to see the forest for the trees, but some Minnesota farmers look to the trees to help increase agricultural productivity and address environmental issues, including water quality. They aren't simply managing the trees; they are intentionally combining trees with forage and livestock systems.

Lifelong farmer Dan Caughey and his family raise beef cattle and dairy cows on more than 1600 acres (1000 owned and 600 rented) near Fort Ripley, Minnesota. They have been working with USDA's Natural Resource Conservation Service (NRCS) for years to improve conservation and productivity on their farm. However, "there are a number of challenges to achieving productivity on our farm," says Dan. To learn how to overcome these challenges, Dan attends community and University of Minnesota (UMN Extension) educational programs to learn about increasing production in a sustainable manner, while protecting the environment.

Recently, researchers and extension educators from the UMN Extension were looking for farmers to partner in establishing on-farm silvopasture demonstration trials. Because Minnesota has more than 439,000 acres of unproductive and unmanaged wooded pasture, according to the 2012 USDA Census of Agriculture, UMN Extension has secured funding to address the issue through outreach activities. Managing these grazed woodlands with best management practices will provide environmental and economic opportunities. Silvopasture is a best management practice that combines forestry and grazing principles. The result is the production of timber, forage, and livestock on the same acreage at the same time. It not only improves the appearance of the landowner's property, it helps the livestock and environment too.

Dan agreed to establish a silvopasture demonstration trial on his farm. Because it was a new concept for him, he was curious as to what this practice had to offer. "On our farm, we have more than

100 acres of wooded pasture and we have fences around them. The beef cows run through the forest. During the summer, the beef cows graze what they can from it. I see that the forested pastures are not productive from an agricultural standpoint. So I am interested in how to make those acres more productive," said Dan.

To assess the impacts of silvopasture economically and environmentally, researchers and extension educators of UMN set up a demonstration to compare the performance of forages and livestock grazing in open pasture and in unmanaged wooded pasture.

Management interventions to develop the silvopasture included timber stand improvement (TSI) by cutting down some trees to encourage forage growth. In the fall, the area was seeded with cool season (e.g., red clover, timothy) and native grasses and forbs (e.g., Virginia wild rye, fringe broom). Cool season grasses dominate Dan Caughey's pasture. Fertilizer was also applied in the silvopasture area to correct soil fertility deficiency.

Dan is actively involved in every aspect of the project. As he walks through the paddocks, he observes a big difference in forage productivity and the cows' health in the silvopasture system. "The most impressive part is that we have five acres of heavily wooded pasture right next to the five-acre silvopasture demonstration. The amount of forage in the silvopasture is much higher than that in the heavily wooded pasture," said Dan. "Grasses in the silvopasture were lush, the cows were happy and were in their comfortable habitat and did not disturb the soil, unlike the heavily wooded pasture where the cows just ground up the soil with their hoofs allowing potential environmental setback," Dan continued.

If shade is added to pastures, it can keep plants cooler and in prime growing condition later in the summer. Reducing heat

Continued on Page 11

📍 Cattle graze beneath trees in a silvopasture system near Fort Ripley, Minnesota. Photo by Diomy Zamora.



Confluence Farms:

Habitat and Farmland Benefit from Partnerships in the Long Tom Watershed

Kate MacFarland, USDA National Agroforestry Center
Katie MacKendrick, Long Tom Watershed Council

Stream and riparian restoration, a riparian forest buffer, a conservation easement, and farming overlap to provide beneficial outcomes for Trey and Tammie Hagen. At Confluence Farms, west of Junction City, Oregon, Trey and Tammie farm blueberries and sell them locally to schools and businesses. They also produce figs, manage meadows for hay, and grow Douglas fir trees. Over 2.3 miles of Ferguson Creek and South Fork Ferguson Creek pass through their farm. The headwaters of these streams are important spawning and rearing grounds for cutthroat trout and other native fish. Trey grew up in this watershed, about a mile and a half from his current residence. As a kid, Trey and his friends spent countless hours fishing, camping, and mucking about along its banks. “In retrospect, Trey says, “I think Ferguson Creek could qualify as my best friend growing up.”

However, as Trey got older, land uses in the area reduced the health of the creek and its banks. The stream became disconnected from its floodplain, down cut in its channel, and left high, steep banks prone to erosion. Their former playground had been degraded. Years later, when Trey’s family bought the Knebel Homestead and the pieces of Ferguson Creek running through it, Trey said “I vowed to do my part to return the stream to its former habitat. This has been my ongoing motivation for involvement with numerous agencies.”

Trey and Tammie became involved with the non-profit Long Tom Watershed Council (LTWC), in addition to other conservation organizations. The mission of LTWC is “to improve water quality and watershed condition in the Long Tom River basin and surrounding drainages through education and collaboration among all interests, using the collective wisdom and voluntary action of our community members.” The property’s large size and contiguity with other LTWC projects made the Hagen property a high priority for creating an extended corridor of improved fish and wildlife habitat.



Log jams like the one pictured at left create pools by slowing down and varying stream flow which can create important habitat for fish and aquatic insects. Photo by Katie MacKendrick.

The LTWC partnered with the Hagens to improve habitat in the creek and on its banks. With conifer logs removed from a nearby wildlife refuge to release oak trees from competition and improve oak habitat, the LTWC created 22 log jams in South Fork and mainstem Ferguson Creek, part of a broader effort to increase the frequency of large wood in four contiguous stream miles. Log jams create pools by slowing down and varying stream flow, allowing the buildup of gravel, which creates important habitat for fish and the aquatic insects they eat. Over time, it also helps reconnect the stream with its floodplain. To improve the creek banks, the LTWC replaced herbaceous pasture grasses and nonnative blackberry with a riparian forested buffer that included a diverse mix of native trees and shrubs across 20 acres. Planting occurred between 2012 and 2014 and actions to ensure the plants establish well will continue into 2018. Trey said that before the process of restoration, about three-quarters of the creek had become inaccessible due to mountains of invasive blackberry bushes. One benefit of this restoration work has been the rediscovery of swimming holes and beautiful stretches of water. Trey mentioned that after the restoration work, “it was like owning a new piece of property of natural wonders.”

In addition to the corridor improvements, the LTWC worked with the Hagens to improve a rocked crossing on South Fork Ferguson Creek. Before the work, the crossing blocked upstream fish passage

during low flows when water would flow through the rock but not over it. LTWC used funds from an Oregon Watershed Enhancement Board small grant to rebuild the crossing at the proper elevation so that water would continue to flow over the crossing, even during low stream flows. The stream crossing is also more farm-equipment friendly with a sloped and graded gravel bed.

Trey thinks there is a symbiotic relationship between Ferguson Creek and their farm; “the better we take care of it, the better it will take care of us.” Trey also mentioned that unlike other berry and fruit farmers in the region, they have not had trouble with pests or diseases in their blueberry and fig crops. While they say that they cannot be certain that they have avoided these issues because of the restored riparian corridor, they think they benefit from the abundance of beneficial insects residing within the riparian corridor. The diverse native shrubs and trees provide shelter and food for pollinators throughout the year. Trey mentioned, “We made the decision quite some time ago to never use insecticides, but it’s nice to have never faced the issue!”

Trey and Tammie also sold a conservation easement to McKenzie River Trust, the local land trust. While they don’t know if conservation easements are right for every family, for Trey and Tammie, “seven years after signing papers on a 62-acre easement running along the western half of our

Continued On Page 11

LESSONS FROM GROWING GINSENG

Kate MacFarland, USDA National Agroforestry Center

Denny Colwell's family has been growing ginseng under forest canopy in Pennsylvania for over 70 years. As he says, "growing ginseng is not something you can jump into on a whim and expect to produce large scale results." Rather, it takes patience and time.

Colwell got involved in growing ginseng because it's something his family has always done. His grandfather started growing ginseng as an extension of his trapping and logging work. He'd always selectively harvested his timber and added ginseng as another income source. Colwell grew up helping his grandfather to plant and manage ginseng. He stresses that it takes time to learn and gain experience. Colwell continued to build the business while working for someone else but has transitioned to growing ginseng full time. In the next ten or fifteen years, he expects that his son will take over the business.

While Colwell has considered producing ginseng in a field under shade cloth, he has decided against this because the quality is lower than that grown in the woods. He points out that, "Like with most other things, you have two choices. You can grow something as cheap as possible and make money on volume, or you can produce a top grade product and get a good price." Colwell prefers to do the latter. He believes his is as close to wild as possible. Producing this quality is a challenge: rather than selling it at 3 or 4 years old, his ginseng is a minimum of 10, but more often 15 or 20 years old.

One of the biggest challenges to forest farming ginseng is the long timeframe required to produce a profit. Sustaining a viable business also requires a lot of land and with the proper microenvironment. Other hurdles include damage from deer and turkey as well as the threat of theft. Forest farming ginseng can also be labor intensive — most of Colwell's work is by hand, including clearing trees that fall and raking leaves in new areas where seeds are planted.

In addition to growing and selling ginseng, Colwell works with others who are interested in this practice. Most people are not interested in large scale production, in part because of the land requirements. Most want to grow just a little to keep the species

Like with most other things, you have two choices. You can grow something as cheap as possible and make money on volume, or you can produce a top grade product and get a good price.

– Denny Colwell

out on the land and for their own use. For those who are interested in getting involved at a larger scale, Colwell impresses upon them that it's not a business that is built overnight. Instead, ginseng can provide a secondary income later in life that might allow someone to retire early or supplement their retirement income.

Recently, Colwell has gotten involved with the Forest Grown Verification Program. This program, administered by Pennsylvania Certified Organic, verifies that his ginseng is produced and harvested in a sustainable and legal manner. It was developed to address issues with unsustainable harvesting of ginseng and other non-timber forest products. This program both assures buyers that the ginseng was not stolen and also assures buyers, consumers, and producers of the quality and identity of the products. There are a number of companies within the US who want to produce forest grown verified products from ginseng, so it is possible that Colwell's business will become even more fruitful in the coming years. †

† Denny Colwell's ginseng grows beneath a forest canopy in Pennsylvania. Photo by Eric Burkhart.



Conservation and Biological Diversity in Organic Production



Miles McEvoy, USDA National Organic Program
Lindsay Haines, Natural Resources Conservation Service

The National Organic Program (NOP) is housed within USDA's Agricultural Marketing Service (AMS). Its role is to protect the integrity of certified organic products by developing clear standards, overseeing the certification of organic farms and businesses, and ensuring compliance with the USDA organic regulations. One reason some operations use agroforestry practices is to help meet organic regulations.

Organic is a labeling term that means the food or other agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices. These practices foster cycling of resources, promote ecological balance, and conserve biodiversity. Certified organic crop and livestock producers manage their farms according to the USDA organic regulations. This means using materials that are approved for use in organic production, and maintaining or improving the natural resources of their operation, including soil and water quality.

What does this really mean?

Organic systems seek to mirror nature by maintaining biodiversity on the farm and using methods that support conservation of natural resources. For instance, organic producers often plant native vegetation throughout a certified organic farm. The vegetation provides food, cover, and corridors for beneficial organisms such as pollinators like bees and bats, slows wind and water down for erosion control, provides groundwater recharge, and filters pollution.

Organic farmers and producers may also use practices that attract or introduce beneficial insects by planting and maintaining diverse plant species. They can protect habitats for birds and mammals, and protect water ways by controlling livestock access to sensitive areas along rivers, creeks, streams, and wetland areas. Organic farmers and producers can also provide conditions that boost diversity in soil organisms by adding organic matter or growing deep rooting cover crops as a part of the crop rotation. Additionally, organic farmers and producers can manage the frequency, intensity, and timing of grazing and forage harvests to protect soil and water quality.

In addition to benefitting the environment and improving soil health, organic operations are often able to decrease their dependence on fertility inputs purchased from off the farm, reduce pest management costs, maintain reliable sources of clean water, increase drought resiliency and achieve better pollination by using these types of production practices.

The NOP recently released new Guidance on Natural Resources and Biodiversity Conservation. It provides information on the types of production practices that could be used to support natural resources conservation and biodiversity, as required by **7 CFR. § 205.200**. For certified operations that also participate in USDA Natural Resources Conservation Service (NRCS) activities (e.g., conservation planning, Conservation Stewardship Program (CSP), or the Environmental Quality Incentives Program (EQIP), etc.), it details which practices may be supported through NRCS as part of its conservation programs and specifies that the operation may refer to a current conservation plan and/or contract developed in conjunction with NRCS or other conservation agency or non-governmental organization as part of their OSP, to meet the requirements of **7 CFR. § 205.200**.

For more examples of production practices that organic producers can and do use to support conservation and biodiversity and meet the organic standards, you can visit the NOP website to download the Guidance on Natural Resources and Biodiversity Conservation. The USDA Natural Resources Conservation Service also provides numerous resources on conservation in organic systems, including technical and financial assistance and their recently published Organic Farming Handbook. 🌱

This article was adapted from a USDA blog post by Miles McEvoy, Deputy Administrator of the National Organic Program and Lindsay Haines, Organic Program Specialist, NRCS, on February 29, 2016 at 11:00 AM "Conservation and Biological Diversity in Organic Production": <http://blogs.usda.gov/2016/02/29/conservation-and-biological-diversity-in-organic-production/>

A few examples of activities that may maintain or improve natural resources and biodiversity that are most relevant to agroforestry and are mentioned in the guidance include the following:

Examples Relevant to All Types of Organic Certification

Soil Composition

- Adding organic matter through the diversity of crops and inputs, to the soil to increase the diversity of soil organisms and to improve nutrient cycling, competitive exclusion of plant pathogens, long-term storage of soil carbon, and adaption to extreme climatic conditions.
- Conserving and restoring forests, shrublands, woodlands, grasslands, riparian areas and wetland areas, which sequester carbon in soils and aid in cycling soil nutrients.



- ④ Riparian forest buffers like the one pictured above support soil stability and water quality. NAC Photo.

Soil Stability and Water Quality

- Creating, conserving, and restoring vegetative covers (forests, shrublands, woodlands, grasslands, riparian areas, and wetland areas) that control erosion and filter nutrient, pesticide, and pathogen pollutants. Minimizing disturbances, maximizing diversity, living roots and cover.
- Using no-till or permanent cover, conservation tillage, terracing, contour farming, micro-irrigation, windbreaks, cover crops, grass waterways and soil health practices.



- ④ Through species selection and design windbreaks can provide benefits for wildlife. NAC Photo.

Water Quantity

- Choosing crops and other plants that are appropriate for the climate and landscape with water conservation in mind.
- Conserving or restoring forests, shrublands, woodlands, grasslands, riparian habitat, and wetland areas that absorb and hold water for long periods as part of a healthy water cycling process.

Native Species and Natural Areas of the Operation

- Conserving and restoring wildlife and native plant communities specific to the site (forests, shrublands, woodlands, grasslands, riparian habitat, and wetland areas).
- Conserving wildlife corridors and large blocks of habitat that reduce fragmentation.

Wildlife Benefits

- Maintaining or improving diverse mixtures of plants to provide food, habitat, or shelter for pollinators, insects, spiders and other beneficial organisms such as arthropods, bats, and raptors.

Examples Specific to Wild Harvest Operations

Soil Stability and Water Quality

- Using practices for wild harvest that maintain or improve soil stability.
- Using practices for wild harvest that maintain or improve water quality.

Native Species and Natural Areas of the Operation

- Maintaining the sustainability of harvested native plants and animals and associated species when determining the quantity and timing of the wild harvest.

Agroforestry for New Farmers: Unexpected Benefits

Kate MacFarland, USDA National Agroforestry Center

Casey Dahl uses alley cropping, an agroforestry practice that produces an agricultural crop simultaneously with a long-term tree crop, to grow chestnuts in Palmyra, Wisconsin. However, he doesn't own the land on which he grows them. Dahl rents land for his chestnuts from Kirsten Jurcek of Brattset Family Farm. Her farm is a long running grass-fed beef operation that recently became the first in Wisconsin to be certified Animal Welfare Approved. In between Dahl's rows of chestnuts, Jurcek continues to produce hay, just as she did before Dahl's chestnuts were planted.

For Dahl, agroforestry was initially appealing for its ecological benefits. Agroforestry increases the amount of diversity in the landscape, which leads to more diversity of animal and insect life. Over time, Dahl has realized there are additional benefits, including economics. While producers are often interested in alley cropping because it balances long term revenue from trees with short term income from crops, for Dahl alley cropping is a way to lower the rent. Dahl has a long-term lease on a portion of the ten acres of land while he is establishing his orchard. This allows him to get started and only rent a small portion of land.

Dahl and Jurcek both caution that leasing ground for agroforestry practices isn't for everyone. Most important is a good relationship and lots of discussion about expectations and practical issues. Dahl said that he had known Jurcek and her family for a long time; they live in the same community where he grew up and he had worked at her farm before. Over the years they stayed in touch and Jurcek shared that she was interested in agroforestry, but didn't really have the time or resources to implement it. Dahl and Jurcek talked about how they could achieve both of their objectives through agroforestry. "It was a long process of discussing everything, talking to insurance agents, and hiring an attorney to write up the lease agreement," Dahl said, adding that it took about two years between the initial discussions and planting the trees. They both believe that taking the time was important to protect one another's operations. Dahl and Jurcek have a lease agreement for 15 years, by which time the chestnut trees will be very productive.

Jurcek's interest in agroforestry also stemmed from its environmental benefits. She first learned about agroforestry at the Midwest Organic and Sustainable Education Service (MOSES) conference about fifteen years ago. "I was totally taken with the idea," she said, "I loved the idea of bringing biodiversity to the farm." However, Jurcek recognized that she didn't have the skillset, time, or human resources needed to plant and maintain trees on the farm. With the lease arrangement, Dahl is able to reap financial benefits and the entire farm reaps environmental benefits.

In addition to providing plant diversity (and the ecological benefits that come from that), including Dahl's operation on her land allows Jurcek's kids to learn from Dahl. "Casey is a good educator and he's teaching them an ag skill that I don't have," Jurcek said. She also appreciates being able to help a new farmer achieve his goals: "I've been fortunate and a lot of people have helped me. I thought it would be nice to give back to another beginning farmer."

Over the long term, Jurcek will continue cutting hay until shade from the trees lowers hay production. At that point Dahl may pay more rent or Jurcek will convert her operation to silvopasture, allowing her cattle to graze under the chestnut trees. However, there are a lot of questions to be answered. How will the land maintain forage production? Will the chestnut trees be large enough to stand up to the cattle at that point? How will they work through key timing issues such as when to harvest the chestnuts? Dahl and Jurcek's strong relationship will be an essential ingredient to working through these issues. While the two talk regularly, their lease also specifies they must meet each spring and fall to discuss how things are working.

Dahl cautions that for many farmers new to agroforestry, the long term aspects of agroforestry can be a challenge. It's hard to envision not just what an operation will look like in the long term, but also what the management needs are along the way. Each step requires different skills and equipment. For example, the equipment needed for planting chestnuts is different from what's needed for harvesting and



☛ Chestnuts are included in this alley cropping system. Photo by Casey Dahl.

maintaining the trees. For Dahl, his leasing arrangement helps him overcome some of these barriers. Alley cropping can require a fair amount of capital for equipment investments; with this arrangement, Jurcek has the equipment for cutting hay, so he only needs what is required for managing the trees.

The lease arrangement also helps overcome another barrier for new farmers: access to land. While for some it's hard to justify putting in perennials when you don't own the land, Dahl's philosophy is that he needed to start sometime. "This may not be the most ideal situation in terms of land access, but it's a situation that works for a certain amount of time and I have a good relationship with the person who owns the farm,"

Dahl points out. In some ways, Dahl sees it as an incubation opportunity – he can get started now, and perhaps one day other opportunities will arise that will lead to him owning his own land.

The lease also forced Dahl and Jurcek to work through questions that Dahl suggests are important to everyone who is implementing agroforestry. Whether or not you own your land or rent it, thinking about goals, challenges, and solutions is worthwhile, Dahl says. In a family operation, sometimes people assume that everyone in the family agrees that agroforestry is the right way to move forward. But asking "is everyone on board?" is important whether you are renting land from someone else or you are establishing agroforestry practices on your own land. †

For more information on agroforestry leases, see *Inspirations for Creating a Long-Term Agricultural Lease for Agroforestry: A Workbook* by Farm Commons at: <https://farmcommons.org/resources/inspirations-creating-long-term-agricultural-lease-agroforestry-workbook>

IN BRIEF...

A periodic summary of agroforestry-related journal articles

John S. Weedon, Connecticut Farmland Trust

Northeast Silvopasture Practitioners Need Information

Researchers chose 20 farms in New York State and New England for interviews and inventories on silvopasture practices and perspectives, the first baseline study for the region. The majority of the farmers in the study had practiced silvopasture 10 years or less; the median years of silvopasture management was four years. Most were beef operators who managed the trees for sawtimber, firewood, and nuts/fruit. Only six were actively regenerating trees. When asked the best way to deliver information, some wanted case studies, others farm tours. Farmers were split on print vs. online. Despite the different experiences and attitudes of the farmers, four key issues emerged from the study: the need to distinguish between silvopasture and wooded paddock grazing, complexity of integrating livestock and tree management, the unique challenges of pigs in silvopasture, and the demand and opportunities for silvopasture outreach.

TAKE HOME MESSAGE: Silvopasture is a nascent practice in the Northeast, and farmers need the same kind of learning infrastructure - best management practices, case studies, and demonstration sites - that underpins established farming methods.

Orefice J, Carrol J, Conroy D, Ketner L. 2016 Silvopasture practices and perspectives in the Northeastern United States. Agroforest Syst. doi:10.1007/s10457-016-9916

Renters: An Untapped Market for Conservation

Renters are increasingly farming more acres compared with people who own all the land that they farm. Kitchen table wisdom has it that renters are only interested in maximizing short-term monetary returns, often at the expense of environmental concerns. A survey of agricultural operators in the Clear Creek watershed in Iowa reveals renters often blend both economic and environmental factors when deciding what and how to plant. Compared to full owners, the Clear Creek renters plant significantly more continuous corn, but they were more likely to practice conservation tillage (no-till, ridge-till, and mulch till). Possible explanations for adopting conservation tillage include mitigating the impact of continuous corn, reducing fuel consumption, decreasing labor hours, and complying with government regulations to receive direct payments and crop disaster insurance on highly erodible land.

TAKE HOME MESSAGE: Because renters are nuanced in their decision-making and able to see beyond one season, agroforesters should include this group of farmers when promoting conservation practices like windbreaks and buffers.

Varble S, Seechi S, Druschke CG. 2016. An Examination of growing trends in land tenure and conservation practice adoption: results from a farmer survey in Iowa. Environ Manage. 57:318-330.

Back to the Future: Producer Implements Silvopastures to Create a New Two-Story Agriculture

John Fike, Crop and Soil Environmental Sciences, Virginia Tech

For a new generation of producers, returning to the farm often comes with desires both to connect to past heritage and to do something different. In Buck Holsinger's case, the motivation for getting involved with agroforestry evolved from a desire to improve stream and pasture management to benefit future generations.

Holsinger runs a 70-acre farm in the Shenandoah Valley that has been in the family for seven generations. He direct markets beef and plans to expand to other pasture-raised livestock. Since the 1980s the farm had been one large open field in endophyte-infected fescue pasture. The fields were continuously stocked and cattle had free access. Over time, a long stretch of water on one side of the property became degraded. To improve the situation, Holsinger sought and received assistance through the NRCS's Conservation Reserve Enhancement Program (CREP) to fence out the cattle, plant trees along the stream, and begin rotational grazing on the remaining acreage.

Although implementing the CREP project began the process of stream rehabilitation, it left his animals without shade or shelter. Not one to watch his cattle stand and pant in summer or carry a layer of snow after winter storms, Holsinger began searching for answers and found J. Russell Smith's book, "Tree Crops: A Permanent Agriculture." The book describes how trees might be used in agricultural systems for improving production and conserving soil. Holsinger's reaction was "I can do this."

Holsinger consulted with specialists at Virginia Tech and NRCS about tree species, planting configurations, and field layout. He secured Environmental Quality Incentives Program (EQIP) funding to help with the planting costs. After many conversations and trips to the field, he drew up the initial designs. Hybrid pitch-loblolly pine trees would be used as windbreaks on the western edge of his property. These would also serve as "trainer" trees for his hardwoods (black locusts (*Robinia pseudoacacia*), black walnuts, thornless honeylocusts (*Gleditsia triacanthos*), and yellow poplars) to encourage more rapid, upright growth. An avid hunter, Holsinger also planted Dunstan chestnuts and persimmon trees for hard and soft mast.

Although Holsinger's farm is not certified organic, he strives to minimize the use of chemical inputs. Thus, when considering

vegetation control for the planting he decided to use scalping rather than killing the sod with herbicide. Scalping worked well for site preparation and was followed by planting, by a commercial outfit, in spring 2014. Unfortunately, the exposed soil presented opportunities for weed encroachment, and the laid-over sod made the ground uneven and difficult to mow. Keeping the weeds down would have been manageable if he only had his day job as a computer engineer, but Holsinger is also a part-time pilot for the National Guard and an extended deployment kept him off the farm last summer, allowing thistles to flourish. Despite this challenge, black locusts have thrived on the site and once Holsinger tackled the weeds the pines responded well. The wild black locusts on Holsinger's farm are a preferred summer food for his cattle. He is now thinking of ways to include this tree as a fodder crop.

Installing the silvopasture also has had unanticipated benefits for management. Holsinger uses semi-permanent fencing with polywire to protect the trees. This has facilitated his rotational grazing management by creating mini-paddocks, which has reduced his time in the field. Even his young children can handle the animal movements now. He also sees anecdotal evidence of a better microclimate for his forages. Holsinger feels confident about what he has learned with his first 19 acre planting and he is putting in an additional 20 acres this year, which will include some soft mast fruit trees to provide additional sources of food for his diversifying livestock operation. He'll use what he's learned to tweak the layout and management of the new silvopasture, including using herbicide for site prep. He sees little risk, thinking it's much cheaper to plant trees that can appreciate in value and improve the aesthetics of the operation than to build a barn that will do the opposite.

In the process of learning, Holsinger has become an advocate of rotational grazing and silvopasture. He has been a willing speaker to agriculture students at Virginia Tech and his farm will be used for field days and service provider trainings. The silvopasture also provides entry to conversation with customers, neighbors, other farmers. The customers get it, he says, and are happy to see a more integrated, "two-story" agriculture that offers improved animal welfare, habitat, and numerous conservation services. Holsinger notes that many who farmed a generation or two back remember having some trees in pastures – and not having large round bales to feed; he enjoys seeing how this "new" way of managing trees and livestock is connected to solutions known in our past. 🌱



🌱 Thistles in scalped tree rows. Photo by John Fike.

Continued From Page 2 — Rosmann Family Farms

“We will add pollinator shrubs like viburnums and other native shrubs over the next few years.” On the day of the interview for this article, February 26th, 2016 Ron said, “As a matter of fact, today FSA, Farm Services Agency, is announcing a new initiative under the Conservation Reserve Program to help organic farmers plant buffers just like this.... We like the diversity of plants because of the wildlife and beneficial insects that we get with the field buffers. But until now those field buffers just didn’t make us much money. They were just a requirement for our organic certification.”

The Rosmann farm headquarters and livestock feed yard are also protected by windbreaks. They have two big windbreak projects planned for the next three years using the Conservation Stewardship Program, CSP. The first is to renovate the old farmstead windbreak. The second is to plant edible nut and fruit crops on some of the bench terraces as well as the neighbor-buffer strips. “By adding diversity to these windbreaks we support wildlife, pollinators for our crops and we might be able to harvest some new crops for our on-farm store,” says Ron.

Another area, about a quarter of a mile long, will be planted with at least three species of pollinator shrubs: nannyberry,

arrowwood and serviceberry. Ron is thinking about adding additional species like plum, pear, blueberries, red currants and buttonbush. This new shrub planting will provide pollinator food and habitat and complement an older planting of rare and declining prairie plants. That prairie planting was placed on the top side of the terrace. That 30 foot strip isn’t farmed. “We do ridge tilling with a Buffalo Tiller. It provides some of the best weed control in our organic operation. I don’t like ridges on my turn rows. So, I planted permanent vegetation there, like this prairie. This makes it a lot smoother to turn around and I need a 30 foot wide buffer adjacent to my neighbors anyway,” says Rosmann.

“An alley cropping system would be cool,” Ron says, “but I can only do so much. We have four windbreaks that add up to a mile or more in length, that need gaps filled. I’ve also got quite a few trees that need to be trimmed up.”

Ron recognizes that windbreaks of trees and shrubs take time and labor but are worth the effort. “Those windbreaks, prairies and shrubs provide a diversity that enriches our lives. You get to see the biological system at work.” 🌱

Continued From Page 3 — New Ways For Old Terrain

stress also creates higher feed value, while the added shade helps reduce heat stress for livestock. Even in northern climates like Minnesota and Vermont heat stress is a common issue that producers deal with. “Silvopasture is a win-win situation because you can add value from the forage, from cutting trees, and from reducing soil compaction,” said Dan.

Demonstrating the theory and concept of silvopasture has heightened Dan’s interest. With the more than 100 acres of heavily wooded pasture that his family owns, there are many opportunities to increase silvopasture on his farm. So far he has seen that converting some wooded acres to silvopasture has improved their cow-calf operation. When the silvopasture system allows Dan to generate or wean more beef calves, there is economic benefit from the system and more saleable products from the farm.

Dan Caughey recently bought 72 additional wooded acres. He intends to harvest some of the timber from this land in winter 2017 for income and follow that by seeding in some grasses. He then plans to convert this wooded pasture into silvopasture that will become part of his rotational grazing plan.

“There are a lot of pastures in our area where cows are introduced and picked up after four months. I really believe in allowing the grass to grow back. Then I turn the cows back in to graze again, and then pull them out to let the grass grow back again to ensure viability of the plant species and help the soil to recover.” Dan is not only interested to learn more about improved pasture management, he is also interested in maintaining and taking care of the land to pass it on to his kids. 🌱

Continued From Page 4 — Confluence Farms

riparian corridor, it has heightened, not dampened, our enjoyment.” In fact, they say “our experience has been so positive that we are currently in deliberation to expand the easement over the majority of our property within the next two years.” The expanded easement would include and protect their working farm acres.

Trey and Tammie’s efforts demonstrate that riparian buffers, corridor restoration, and habitat improvements are very compatible with farming. Partnerships between farmers and nonprofits can help produce many environmental benefits consistent with and beneficial to farming operations. 🌱



Before and after pictures of the riparian forest buffer installation at Confluence Farms. Photos by Katie MacKendrick.

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February 17-18

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Lake Placid, NY
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June 27-29, 2017

North American
Agroforestry Conference
Blacksburg, VA
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For more upcoming events, visit our website calendar: <http://nac.unl.edu/events>

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