

Stabilizing the Climate with Regenerative and Perennial Farming Practices

Climate change is already making our planet less inhabitable, with droughts, floods, and severe weather events on the rise. Stabilizing the climate is perhaps the central challenge for humanity in the early decades of this century. While reforestation is a critical strategy to sequester carbon, climate change science tells us that we cannot sacrifice agricultural land to plant carbon-capturing trees. But perennial farming practices can offer us the best of both worlds, including agroforestry, coppice, rotational grazing, and remarkable staple crops that literally grow on trees.

Globally, a massive switch to regenerative practices, perennial crops, and regional self-reliance are essential to sequester carbon and reduce emissions. The organic farming and gardening community is already on the forefront of these efforts, but much more is required. Regenerative agriculture is a multipurpose strategy, addressing soil building, regional self-reliance and food sovereignty, perennial farming systems development, climate justice, and productive conservation. As farmers, gardeners, food system organizers, and citizens, it is time for us to reorganize agriculture to address the climate crisis.

The Worldwatch Institute report *Mitigating Climate Change Through Food and Land Use* lays out a palette of farming practices with a positive climate impact. The first set are improvements to annual agriculture, many of which have been practiced by organic farmers for decades (or centuries), and include various soil building techniques, reduced tillage, and reduced use of chemical fertilizers. The report also notes biochar as an important strategy. Rotational grazing, restoring degraded lands, and protecting intact habitats are also mentioned.

Most interesting to me as a plant geek is the report's emphasis on the importance of perennial crops and agroforestry systems that integrate annuals with working trees. My research indicates that carbon sequestration by perennial farming systems can be a major contributor to climate stabilization. If we were to convert the world's sloping farmland from annual to perennial crops or to perennial-annual agroforestry systems we could sequester roughly 8% of the 200 gigatons of atmospheric carbon that need to be removed from the atmosphere (see my article in the upcoming *Permaculture Activist* for calculations). And we don't need to limit ourselves to sloping land – agroforestry can improve the productivity of much of the world's farmland.

This sounds lovely, but what does it mean for the Northeast? Cold humid climates like ours have the best carbon-holding capacity of all the world's regions. We have strong movements for localization, soil building, and rotational grazing. However, besides fruit orchards, asparagus, and rhubarb, we are not producing or eating many perennial food crops, and our models for perennial food production are mostly small-scale and experimental.

What we do have are a number of interesting crops ready for production in direct-market farm operations. These include some low-maintenance fruits and berries, some very interesting nut species, and a number of perennial vegetables. This last group includes such new specialty crops as climbing spinach (shoots and greens), perennial arugula (salad), sea kale (broccoli), and many interesting perennial alliums from scallions to leeks.

Commercializing the success of the edible forest garden requires some entrepreneurial minds willing to experiment. Around the country farmers are trialing new crops and production systems. Permaculture farms like Three Sisters in Pennsylvania and Forest Agriculture Enterprises in Wisconsin are developing markets for tree crops and the useful perennials that grow beneath and between them, providing pest control and improved fertility as well as specialty products.

Of course we have a long way to go in developing perennial staple crops for cold climates. Two efforts have been under way for several decades. The Land Institute's work to develop perennial grains is

fairly well known in organic circles (as is Rodale's perennial grain work). Perennial grain breeding is making headway, with recent reports of perennial wheat yielding about 70% as well as annuals. The other direction for perennial staple crop breeding is the work of Badgersett Research Corporation to replace corn and soybeans with chestnut and hazel. Their breeding work has had remarkable results, including chestnuts with nine nuts per burr instead of three to four.

The organic movement is already on the forefront of carbon-friendly farming. It is my hope to use the 2011 NOFA summer conference to put forward additional crops and practices that can solve global problems while simultaneously providing healthy food for our region.