

Permaculture People's Garden at the Forest Products Laboratory

The garden around the hawthorn and crabapple trees adjacent to the Research Demonstration House was designed using permaculture principles as a part of the USDA People's Garden Initiative. This unique garden was designed to provide a sampling of the USDA's efforts to teach others how to nurture, maintain, and protect a healthy landscape.

Permaculture is a systems-level form of ecological gardening design that uses techniques and practices that combine the best of wildlife gardening, edible landscaping, and native-plant cultivation into one low-maintenance, self-contained, and productive ecosystem.

When deciding on the garden design, our designers walked the 25 acres of Federal property where the Forest Products Laboratory (FPL) resides. They noticed that this property, with the main buildings built on top of a hill, has some fairly serious erosion and concerns with water. Bare spots in a downward path of the Research Demonstration House's lawn tell the story of runoff.

As more buildings and roads are constructed, runoff has become an increasing concern because roofs, roads, parking lots, sidewalks, driveways and other hard surfaces are impervious to rain. Virtually all of the rain that falls on these surfaces has nowhere to go but downhill, fast. As a result, flooding increases in frequency and severity. The speed of water moving across the land and in streams increases and accelerates soil erosion.

Much of the soil washed off vacant lots, cleared land, uncontrolled construction sites, and from road cuts is carried into streams, storm water sewers, and Madison's lakes. This runoff will likely include a variety of pollutants: metals from downspouts and pipes, paints, brake linings, engine drippings, and residue from tires join nutrients from lawn fertilizers, detergents, leaves, and animal wastes.

To address our concerns about runoff and to provide both beauty and food, we designed a guild (a community of supportive plants) for the understory of established trees for our People's Garden. In permaculture, certain botanicals work together as "guilds" to conserve water, ward off predatory insects and animals, choke out weeds, build soil, grow edible produce, and encourage beneficial insects and birds. Many shrubs, bulbs, herbs, flowering perennials, and annuals make great understory plants for crabapple guilds.

For this design, the first step was to lay out three swales and berms on the fairly steep slope. A swale is simply an open-air gently sloping ditch dug on the contour (equal elevations) of the land. This ensures that the water will flow into the swale and not around it. A berm is an earthen dam on the down side of the swale, created from the excavated soil dug from the swale.

Swales and berms not only capture the rain to prevent runoff, but they conserve the water for future use by forcing the rainwater into the Earth down to the impervious layer of soil. The water then infiltrates under the surface and provides plant roots with needed



irrigation. Such water can travel great distances and be stored for extended periods of time because the water has a chance to slowly filter into the ground rather than run off into the storm sewer. Swales and berms, similar to their better-known counterpart, the rain garden, thereby reduce nonpoint source pollution and protect our lakes and streams.

In keeping with the People's Garden Initiative, the Earth Day 2010 workday brought in community volunteers from the Madison Area Permaculture Guild, Sustainability on Stilts, UW-Madison, and the UW Arboretum, who worked side by side with FPL employees. These individuals and others from the Permaculture Guild and FPL donated a variety of plants. Our hardy volunteers dug the swales, while other volunteers prepared five dumpsters of cardboard for the next step of sheet mulching.

Sheet mulching has many names and just as many variations. The basic idea is that instead of pulling out sod, tilling or digging the soil, and incorporating compost or manure to create a garden bed, sheet mulching builds the soil on top of what is already there. The process, then, is one of *construction* rather than *disruption*, using the main ingredients of compost: nitrogen and carbon. The volunteers covered the cardboard with 30 yards of chipped bark, thus providing an effective weed barrier, as well





as the carbon (cardboard and bark) needed to interact with the nitrogenous layer of sod. This sheet mulching will effectively create compost in place and thus enrich the soil and encourage microbes, beneficial fungi, and earthworms.

The next step was to plant fruiting shrubs (currants, American highbush cranberries, and dwarf Nanking cherries) in the berms, along with clover and annual rye grass. Other plants were added in the berms and around the trees, with specific purposes for the guild: insectory plants (yarrow, borage, nasturtium, allium, and bergamot), whose blooms attract pollinators; nitrogen-fixing plants (lupines, clover, and prairie indigo), which capture free nitrogen from the atmosphere and

convert it into a form of nitrogen that can be absorbed by plants; and dynamic accumulators (comfrey, allium, and daylilies), plants whose deep roots bring up trace minerals from the soil. Together, these classes of plants provide the guild that supports the trees.

Other than needing to apply more wood chips or mulch at least annually, the guild garden will be relatively self-sustaining. The Research Demonstration House and its companion Carriage House demonstrate sustainable, innovative ways to use rainwater, and the Permaculture People’s Garden complements that research by catching and holding rainwater on the land while providing beauty, food, and wildlife habitat.



In May 2010, 1 month after planting, the fast-growing rye grass and clover, planted to prevent erosion, have covered the berms and swales. The other plants and shrubs in the garden will take more time to become established.

