



Conservation Farming

Conservation Farmers are good and important neighbors in our watershed. Conservation is the planned management of natural resources, such as soil, water and air, to prevent exploitation, destruction or neglect.

Conservation Farms add character, beauty and open space to the Scituate Reservoir Watershed. We are very fortunate to live in an area where we see trees, farms, and natural open space. They give us the opportunity to connect with the land. We can pick apples, blueberries and strawberries at local farms. Farms are a very important part of our landscape. Once they become developed, they are not likely to ever be restored to their historical value.

Farms in the Scituate Reservoir Watershed provide people with corn, eggs, apples, tomatoes, peaches, blueberries, strawberries, squash, onions, pork, beef, chicken, turkey, lamb, pumpkins, eggplant, hay, flowers, ornamental plants, goat cheese, milk, wool, soaps, honey, wood, witchhazel, maple syrup, mushrooms, Christmas trees, wood and more! All of these products depend on soil to grow.

The vegetables, trees and other plants start out as seeds planted in the soil. **It can take 500 – 1000 years for nature to produce 1 inch of rich topsoil!** Soils are a naturally occurring mixture of minerals (broken up rocks), organic matter (dead and living plants and animals), water and air. Soils provide rich nutrients for plants to grow in. The animals eat plants that are grown in the soil. We drink milk, eat cheese, eggs and meat that come from the animals.

Conservation Farmers provide the essentials of life for a variety of wildlife: food, water, cover and space.

Conservation Farmers address soil, water, air, plant, animal and human (SWAPA+H) natural resource concerns:

Soil:

Conservation Farmers protect soil by keeping it covered with vegetation at all times, using cover crops after harvest and during times when the fields are not being used for production. They install conservation practices like diversions, waterways and terraces to slow water down on steep slopes to reduce/prevent soil from washing away in a process called **erosion**. They minimize the number of times they drive across a field and try not to plow/till unless absolutely necessary to reduce soil compaction – when soil is compacted, water and air do not enter it easily increasing runoff and reducing beneficial bacteria that help plants grow.

Conservation Farmers add soil amendments, like **compost** and manure to increase organic material and improve soil health. They test the soil to determine the amount of nutrients (fertilizers) to add so that excess nutrients are not washed into rivers/ponds or leached into groundwater and wells.

Water:

Conservation Farmers do their best to protect and conserve water resources. Farmers use fertilizer, spread manure, spray pesticides, graze animals and irrigate crops – many of which are necessary farming practices. Conservation Farmers take measures to ensure that when they do these activities they do not pollute surface and groundwater and they do not use more water than they need. They establish vegetated buffers along stream and ponds to prevent runoff and erosion from entering water bodies, they fertilize only what their plants need so excess fertilizer does not leach into groundwater. They time their nutrient applications during periods of good weather so manure is not washed away. They scout for pests and apply pesticides only when necessary and at minimum rates. They utilize efficient irrigation systems so water is not lost to evaporation, or by runoff due to saturated soils. They keep their animals out of streams and ponds and provide them water in dry areas. They collect and store manure in a location where the soil is not

saturated and runoff is minimized, often they construct a concrete facility with a roof for the sole purpose of storing manure. Many conservation farmers also maintain farm ponds so that they benefit wildlife like fish, birds and turtles.

Air:

Conservation Farmers minimize the use of on farm equipment, by reducing their tillage (plowing) operations and orientating their fields for optimal use. Tractors and other equipment like diesel/gas pumps and greenhouse heaters use fossil fuels and emit greenhouse gasses that contribute to global warming. By minimizing the use tractors and other vehicles and switching to more efficient equipment (pumps), conservation farmers help improve air quality. Conservation Farmers are also early adopters of renewable energy equipment like windmills and photovoltaic panels, electric pumps and heaters, which can replace traditional fossil fuel burning equipment.

Conservation Farmers also take measures to reduce dust, odors and chemical drift from pesticide applications by monitoring weather conditions and installing conservation practices like windbreaks (a row or multiple rows of trees/shrubs that vary in height) to disrupt air flow to their neighbors.

Plants:

Conservation Farmers monitor their fields for **invasive plant species**, which often out compete **native**, more beneficial species. They take measures to control invasive species before they spread to other places on and off the farm. Conservation farmers take the health of their crops very seriously. They proactively monitor for pests that are harmful to their crops and take measures to reduce the pests impact before it becomes a severe problem. They apply fertilizers and water to meet the plant's needs for optimal growth and may even test the plant tissue to determine what nutrients are required. Many conservation farmers also plant field borders and other areas with plant species that provide pollinator and other wildlife habitat. They may create or maintain forested buffers along ponds and streams to allow wildlife to travel to adjacent properties.

Animals:

Conservation Farmers strive to ensure the health of their livestock by providing adequate water and food, and suitable living conditions. Heavy use areas are established in places where animals are confined to allow for collection and removal of manure and to provide shelter during inclement weather. Animals are grazed according to a rotation schedule to allow pastures to rest and grow in order to maximize plant forage availability. Feed is provided when forage is not available. Conservation farmers also create or maintain habitat for wildlife like birds, mammals and invertebrates, in areas that are not used for growing crops or pasturing animals. Types of habitat may include shrub, early successional and forest, as well as grassland. **Conservation Farmers provide the essentials of life for a variety of wildlife: food, water, cover and space.** Farms usually have streams or watering ponds. There are a lot of areas for wildlife to find a home, like the hollow of a tree or burrows underground. Different species need special circumstances to reproduce. For example, **vernal pools**, that usually only appear in spring, are often found on farms. They provide an area for amphibians to lay their eggs without the threat of predators that are found in larger, year round water bodies. Conservation Farmers also manage their crop/pasture/hayland in ways that benefit wildlife, such as cutting hay fields after ground-nesting birds have fled, or spraying pesticides in the evening or at night when wildlife are less active.

Humans:

Conservation Farmers are also concerned about the human aspect as a resource concern. They take care to mitigate on-farm activities so that their neighbors' are properties are not impacted. Field borders, windbreaks, hedgerows etc... are used to control runoff, odors etc. from leaving the farm. Conservation Farmers provide opportunities for their neighbors to participate and learn about their farming operations and its benefits. Conservation Farms provide the oxygen we breathe, remove greenhouse gasses from the atmosphere and provide the food we eat.

"In a remarkable turn around from the prior century, the state is now growing new farms and farmers. According to the U.S. Census of Agriculture, the number of farms in Rhode Island swelled from 858 to 1,219 between 2002 and 2007 — an increase of 42 percent that is the highest in New England and 10 times the national average."
Kenneth Ayars,
Chief RI Division of Agriculture
Eco RI News

Credit for SWAPA + H to: Justin R. Tuthill - USDA Natural Resources Conservation Service, District Conservationist - Providence County

Since 1940, RI has lost 80% of its farmlands. In 1940 RI had 300,000 acres of farmland, in 2010 the number of acres of farmland in RI was estimated to be 40,000 acres. Land is very expensive in RI and more money can be made by development than by farming.

Part III Conservation Development

Much of the loss of farmland is due to urban sprawl. Urban sprawl has occurred over the past several decades when the majority of residents began to move from cities to suburban and rural areas, primarily

on larger portions of land. Vast amounts of forests and farmlands were sold and subdivided into large lot subdivisions for homes or businesses.

Instead of an average family living on a typical urban lot which is 5,000 square feet, people who moved (sprawled) into the rural communities typically reside on 120,000 square feet (where zoning requires 3 acres of land per house.) The collective impact on the state has resulted in an extreme reduction of farmland, forestlands and open space. This leaves less space to grow our food and recreate. It means less room for wildlife, and fragmentation of land which impacts the ability for wildlife to have sufficient space to live and reproduce. It also means an increased stress of pollutants on our natural resources, like the water, soil and air that we need to live.

Leaders are now seeing the value of living in cities, in multi-family housing units and on changing zoning toward conservation development.

If more people lived in cities, we could improve our mass transportation systems and save on fossil fuels. In cities people can walk to many locations which conserves fossil fuel and increases physical activity - improving health.

When communities consider conservation development by changing zoning laws, developers are able to look at the land differently. They start with considering the natural resources (streams, forests and wetlands) and cultural resources (stone walls and historical features) and place the houses in closer proximity to one another, leaving room for recreation, community gardening, and wildlife. They can still build the same number of houses on a particular piece of land, but the way they place them leaves more room for open space. They may also put in mixed use zoning, which would allow for stores, restaurants, offices and homes to be in the same neighborhood, mimicking the value of cities where people can walk to many destinations.

In the Scituate Reservoir Watershed, villages serve as mixed use areas and are a resourceful way to use the space for families to live.

People who live in cities and villages must be very careful how they treat the land because more of the land that the rain falls on is covered with pavement, businesses and homes (**impervious surfaces**.) Because the rain cannot penetrate these hard surfaces, most of the water will rush over the surface carrying pollutants with it into local water bodies. This runoff is called **stormwater**. As new developments are built, more consideration is given to **low impact development**. Having pervious pavement or gravel driveways, using rain barrels to collect roof run-off for watering later, installing rain gardens to filter stormwater run-off from roofs, driveways and parking lots, and green roofs are some examples low impact development.

Part IV Conservation Gardeners

While RI has lost 80% of farmlands since 1940, there is a resurgence of interest in growing the food we eat. The number of farms in RI has recently increased by 42 percent while the amount of acreage used for farming has only increased by 11 percent. That means we have a growing number of small farms.

You can be a part of this great resurgence by growing your own garden!

You can plant a garden in your yard and produce many of the foods and products that we obtain from farms. During World War II, Victory Gardens produced 40 percent of the vegetables people ate. Gardening is fun and easy! You can be a Conservation Gardener by applying many of the same methods that farmers do.

Garden Classroom Activity Suggestions (Contact NRICD if assistance is needed):

- Teach about gardening, organic gardening and/or composting
- Start seeds at school
- Plant a garden at school
- Start a compost pile at your school
- It All Flows Down Stream (see attached)

Planting a garden (teachers please add your own suggestions to our recommendations):

Remember to start with good soil. You should get your soil tested.

You will also need seeds or starter plants for your garden. You can start seeds indoors using cardboard egg cartons. The egg cartons are biodegradable and can go directly into the soil when you plant outdoors. Read the label to find out when to transfer your plants outside, or you can plant the seeds directly in the garden.

To prepare the ground in your yard, ask your parents for permission and help. Find a sunny place that is not wet or rocky, and not close to your well or septic system. Determine how big your garden will be and mark it off with some string or stakes. Turn the soil by digging up 8 – 12 inches with a shovel. Break it up and rake it. If your parents prefer, you can plant a raised bed garden. Use wood to enclose the area and fill with soil.

What did your soil test indicate? Ask your parents to help determine if you need to add anything to the soil.

You can add compost to your garden, it will feed your soil. Composting is a great way to recycle vegetable scraps, yard waste and other organic matter and return the rich nutrients to the soil. See the Compost Activity provided.

Once your garden is planted, be sure to keep an eye on the weather. Your garden needs to be watered if it has not rained. Check to see if the soil is moist.

Once a week you can weed your garden.

Be patient. Enjoy!

You can try organic gardening. Organic gardens are gardens that do not use chemical fertilizer or pesticides. Rotating crops like farmers do is beneficial to organic gardening. Organic gardeners often use companion planting which lessens the need for fertilizers and protection from pests. Companion gardening is the practice of planting two different plants in close proximity to each other on the theory that they help each other in some way. Some plants complement each other, giving off by products that the other plant needs. Those by products are chemicals and micro-nutrients. Other beneficial plants provide some protection against insects and planting a few of them near a desired plant will keep the insects away (see below for examples).

You can create a drip irrigation for your garden.

If you do not have the time or space for a big garden, you can grow vegetables or flowers in a container on your lawn, deck, porch or even your roof.

You can plant a rain garden. A rain garden is a garden shaped like a bowl that is used to catch and filter rain running off a roof or parking lot (stormwater). Usually native flowers, plants or trees are planted in the rain garden, not food. The rain garden filters out pollutants and helps to clean the stormwater. Rain gardens help store water during a heavy rain storm and prevent flooding. Rain gardens can be very attractive and can be designed to attract butterflies, and other important pollinators like bees. Many of the foods we eat require pollinators. To see what a rain garden looks like, you can visit a rain garden demonstration site that is located behind Bentley’s Tavern in North Scituate, RI at the corner of Routes 116 & 6. Learn more about rain gardens at www.nricd.org.

Just like Conservation Farmers, you can make sure that any waste from your pets or animals does not end up in the water. If you have pets, like cats or dogs you can pick up pet waste and put it in the trash. If you have farm animals, you can rake the waste to a high place away from your well or any surface water and cover it with a tarp so that it doesn’t wash off in the rain. Under the manure you should have either a concrete pad or a plastic lining. You can use the waste from your agricultural animals as fertilizer on crop lands in appropriate amounts (based on soil testing) once it is dried, or you can take it to a compost facility or use some in your compost pile. Keep all manure at least 100 feet away from wells or surface water.

Companion Plants		
Try:	With:	For:
Borage	Pumpkins, squash, cucumbers and a variety of plants.	Squash Bug and other insect control. Note, a disadvantage is they spread "everywhere".
Basil	Peppers, Tomatoes, Marigold	Keeps flies and mosquitos away
Garlic	Roses, tomatoes and a wide variety of	Wards off aphids and other insects and pests.

	flowers and vegetables.	
Mint	Cabbage and Broccoli	Deters Cabbage moths
Marigold	A wide variety of flowers and vegetables.	Wards off insects. They are also used in Organic Insect sprays .
Nasturtium	Pumpkins, Squash, and a wide variety of vegetables.	Deters Cucumber Beetles, Squash Bugs, Aphids, and more. And, they are edible!
Rosemary	Cabbage and Broccoli	Deters Cabbage moths
Sage	Carrots	Wards off Carrot Fly
Thyme	Cabbage	Deters cabbage worm

From <http://www.gardenersnet.com/atoz/compan.htm>