

Memorandum

To: Mayor Haemmerle and Hailey City Council;

From: Hailey Tree Committee

RE: Recommendation regarding Water Conservation Landscaping Guidelines and Plant List

Date: May 7, 2018

Background: A working group of representatives from the community have collaborated resources and efforts to produce a list of best practices and guidelines for establishing and maintaining landscaping while conserving water resources. Discussed at the regular meeting of the Hailey Tree Committee on March 8, 2018, the Committee gave a recommendation regarding the Water Conservation Landscaping guidelines.

The following recommendation was made on March 8, 2018:

The elements of the recommendation for landscaping within the Water Conservation Landscaping guidelines include:

- The necessity for diversity in species. Native plants definitely have their benefits, but nonnative plants should not be discouraged only because they are nonnative. The selection of plants that will thrive in this valley is slim. When limiting that list more, the risk of monocultures increases. This scenario is ideal for insect and disease infestations.
- The term compost is too general. Compost is decayed organic material. It would be helpful to know, specifically, in this valley, what compost needs to contain, and ratios of these materials.
- When composting or adding mulch around plants, trees will not thrive if the top dress material meets the trunk. Having this dark and slightly wet area at the base of a tree is very inviting for insects.
- There is a lot of good information in the irrigation section of this document. It is important to encourage people and for people to understand that, though there are many inefficiencies in irrigation systems, watering for longer time periods at infrequent intervals is key for reducing water and becoming closer to meeting the water needs of many landscape plants.
- The list of Drought Tolerant Trees, Shrubs, and Grasses for The Wood River Valley lists *Pinus spp* and *Picea spp*. This is too general. The lesser planted species that will do well should be encouraged.

The Mayor and Council allowed the Hailey Tree Committee to take the landscaping guidelines and the plant list to their next meeting and make revisions applicable to Hailey that would be presented to Council on May 14, 2018.

Recommendation: The Hailey Tree Committee reviewed the Water Conservation Landscaping Guidelines and Plant List and made changes that fit within Hailey. At their regular meeting, on Monday, May 7th, 2018, the Hailey Tree Committee voted to recommend updates of these guidelines to Council.

One member abstained from the vote; the vote passed. The updates to the Water Conservation Landscaping Guidelines and Plant List from the Hailey Tree Committee are attached to this memo.

Water Conservation Landscaping *guidelines*

These standards of practices have been drafted by industry experts, local municipalities and nonprofit organizations to promote water saving techniques and efficiency standards. The Wood River Valley is a dry ecosystem averaging 10-18 inches of precipitation a year. Using proper design, watering efficiently, and implementing sustainable practices can reduce the strain on this valuable resource and save water users money.

Soil composition: First, determine what type of soil and drainage you have. Knowing the soil texture will help you choose the proper watering practices. Many soils in the Wood River Valley are extremely rocky because the valley was a glacial outwash with round cobbles and because of this some landscapes have been capped with various depths of topsoil, which could be high in clay. This clay layer could impede drainage and limit air spaces. Clay and compacted soils will retain water longer but will not promote deep roots for plants thus decreasing their ability to withstand drought. Without topsoil or compost some soils may be so porous that water flows away quickly.

Soils and Compost. Soils with 25% compost can hold four times more water than soils without composted matter. Compost is an excellent way to amend existing soils or build better soil. By adding compost you improve water infiltration and decrease runoff and erosion. Compost improves the water holding capacity of the soil and improves the microorganism life in the soil which allows plants to utilize necessary soil nutrients and minerals. Healthier plants are able to better withstand drought.

A minimum of 25% compost needs to be added to existing soils because the soil types in the Wood River Valley do not have adequate organic material for water holding capacity.

- 🍷 All new turf areas require a soil depth of 6": ONE PART COMPOST TO 3 PARTS SOIL.
- 🍷 All new shrub and flower beds require a soil depth of 12": ONE PART COMPOST TO 3 PARTS SOIL.
- 🍷 During excavation, existing soil is to remain on site and temporarily fenced to protect from compaction.
- 🍷 Protect and minimize disturbance of existing trees and vegetation when excavating.

Mulch. Organic mulch is composed of materials such as **leaves**, bark, wood chips, soil pep, and wood compost. Mulch works to keep plants cool, prevent soil crusting, minimizes evaporation and controls weed growth.

- 🍏 All shrub beds, tree rings*, exposed soil and beds should have 4-6” of mulch to minimize evaporation.
- 🍏 Mulch around trees should ***be placed several inches away from tree trunks** and go to the outer drip line of the trees.

Vegetation. Choosing the right vegetation can significantly reduce water use. Native or drought tolerant species require 1” or less of water per week. Use of floodplain trees species are effective for compacted soils.

- 🍏 All turf species should be native or drought tolerant
- 🍏 30% of trees and shrubs should be low-water use plants

Irrigation for Trees: During a drought, trees must be given top watering priority over your lawn. Irrigation systems designed to water turf do not sufficiently water your trees. A general rule for watering trees is to water deeply and infrequently rather than frequent shallow watering. Sprinkler heads watering on or too near the tree's trunk should be redirected to the drip-line and beyond. Lawns can be replaced in a matter of months whereas a 20 year old tree will take 20 years to replace.

What you can do to save trees during a drought or water restrictions:

- ***Deeply and slowly water mature trees 1 – 2 times per month*** with a simple soaker hose or drip system toward the edge of the tree canopy – NOT at the base of the tree. Use a Hose Faucet Timer (found at hardware stores) to prevent overwatering. How much to water your trees? Measure the trunk diameter at knee height. *General formula:* Tree Diameter x 5 minutes = Total Watering Time. Example: When you hand water using a hose at medium pressure, it will take approximately 5 minutes to produce 10 gallons of water. If you have a 4” diameter tree, it should receive 40 gallons of water - multiply by 5 minutes to equal total watering time of 20 minutes.
- ***Young trees need 5 gallons of water 2 – 4 times per week.*** Create a small watering basin with a berm of dirt.
- ***Do not over-prune trees or fertilize during drought or the heat of summer,*** both which stress your trees.
- ***Protect the tree root zone (drip line)*** to obtain maximum water infiltration and also help it rejuvenate the soil microbial activity. The **tree canopy drip line** is the beginning point of where the tree begins to get moisture from the soil. The drip line is the area directly located under the outer circumference of the tree branches is where the tiny rootlets are located that take up water for the tree. Trees should be watered here, not by the base of the trunk, or the tree may develop root rot. Tree root locations are opportunistic and will travel a distance equal to the height of the tree to get moisture. In a natural, undisturbed situation, tree roots go beyond the tree canopy easily a third the distance of the tree radius. Feeder roots are concentrated in the upper 6-8in (152-203mm) of soil, where there

is abundant oxygen and moisture. Roots under the tree canopy are mainly for support. Deeper roots are for support and they seek water during dry conditions. Use need non-chlorinated water and to build up the microbial activity in the soil.

- ***Make the Soil around the tree drip line more absorbent.*** To insure deep watering in times of drought and water restrictions, each droplet of water is so valuable. To maximize the water infiltration drill a 2-3 inch size hole in the soil to a depth of 24 inches and space these holes every 2 feet around the circumference of the tree. Fill each hole up with hollow sand. In addition, the use of some **compost** mixed in with top soil at time of planting will help with absorbing water, but using too much compost can create air pockets as it decomposes. Avoid using woody compost in soil as this will use up nitrogen as it decomposes and can change the soil pH.
- ***Watering deeply in non-drought means to saturate the ground over a long period of time*** such as 24 hours. Saturation should be done by setting the water flow out of the hose to a stream about the size of a pen or straw. Place the end of the hose within 2 to 3 feet of the drip line and allow the water to flow for three to five hours, and then move it to another area within the drip line area. Continue the process until you have saturated 2 to 3 feet on both sides of the drip line all the way around the tree. Watering this way allows the water to reach the roots at the bottom of the root zone and puts the water where the water harvesting roots are located.

Tree loss is a very costly problem: not only in expensive tree removal, but also in the loss of all the benefits trees provide. **Your trees provide an immense range of health, energy, environmental and economic benefits:**

- Trees improve air and water quality
- **Trees provide shade to the landscape and reduce water needs**
- Trees help keep your home cooler
- Trees slow storm water runoff and help recharge groundwater
- Trees reduce soil erosion
- Trees add value – sometimes thousands of dollars' worth – to your home and neighborhood

Irrigation tips for your landscape and turf: To reduce overwatering, be aware of evapotranspiration (ET) needs. During cool, wet weather irrigation systems should be shut off until there is a need for irrigation. Some plants will display wilting in the heat of the day, but recover when it is cooler in the evening. Do not use overhead sprays in the heat of the day or when it is windy.

Current irrigation system installations have no regulation for efficiency. Without using industry best practices, irrigation systems can waste 40-60% more water than they should. Following the best practices guideline, the user can rest assured that they will have a system that saves water and protects the water resources.

- 🍏 All landscapes are limited to irrigating .5 acre or less unless there is an additional water right.
- 🍏 Sprinkler system should have an approved backflow preventer if tied to a potable water source. Backflow should be installed so during winterization no air will be blown through backflow preventer.
- 🍏 Sprinklers should be laid so that the area is getting hit with a minimum of two sprinklers. This provides for 100% coverage. Recommended overlap would be 5-10%.
- 🍏 Limit of .60" per hour for sprinkler application rates. 1/2" bubblers are not recommended due to their high application rate and poor distribution uniformity (coverage).
- 🍏 All sprinkler types should be pressure regulated to either 40 or 45 pounds of pressure at the sprinkler head to assure uniform sprinkler nozzle distribution rates. 15 psi is recommended for delivery to the far end of any drip zone for proper operation. Recommended spray height: 4" pop up for mowed grass and 12" pop up for natural areas.
- 🍏 Sprinkler nozzles should have matched precipitation rate so the same amount of water covers each zone.
- 🍏 Drip should be laid out in a grid pattern so water is uniform in distribution and it is staked to the ground a minimum of every 24" to assure the drip tube stays in contact with the soil.
- 🍏 Drip pipe should be 1/2" pressure compensating and also have a check valve to prevent drain out.
- 🍏 Pots, barrels, or hanging baskets are recommended to have a dedicated irrigation zone. Irrigated with 1/4" pressure compensating drip tube no longer than 15' in length. 1/4" drip tube shall not be more than .6 gallons per hour water pressure.
- 🍏 Plant materials with similar water needs should be planted in the same irrigation zone.
- 🍏 Sun areas and shade areas should each have a separate irrigation zone.
- 🍏 Sprinkler controller should be able to adjust irrigation automatically via weather station or soil moisture sensor (Time Domain Transmission recommended). Irrigation and Smart Technologies should be installed to industry/manufacturers standards (including 2-wire systems).
- 🍏 If property has more than 5 feet of elevation change - all sprinkler heads should incorporate check valves to prevent all of the water from draining out of the low heads.
- 🍏 For larger sprinkler systems with a water supply that is larger than 1-1/2" a flow meter

Drought Tolerant Trees, Shrubs, and Grasses For The Wood River Valley

Watering levels are for plants that have been established for a minimum of one year. These watering levels are above and beyond any natural precipitation that may fall during the growing season. Low = 0.2-0.5 in/week, Medium = >0.5-1 in/week, High = >1 in/week. FS = sun, DS = dappled shade, S= shade

Conifer Trees

Common Name	Botanical Name	Water Needs	light
White fir	<i>Abies concolor</i>	Medium	FS/DS
Rocky Mountain Juniper	<i>Juniperus scopulorum</i>	Low	FS
One seeded juniper	<i>Juniperus monosperma</i>	Low	FS
Western Larch	<i>Larix occidentalis</i>	Medium	FS
Pinyon pine	<i>Pinus edulis</i>	Low	FS
Bristlecone pine	<i>Pinus aristata</i>	Low	FS
Pondersosa Pine	<i>Pinus ponderosa</i>	Low	FS
Limber pine	<i>Pinus flexilis</i>	Low	FS/DS
Lodgepole pine	<i>Pinus contorta</i>	low to med	FS
Austrian pine	<i>Pinus nigra</i>	Low	FS

Deciduous Trees

Common Name	Botanical Name	Water Needs	light
Apple	<i>Malus spp.</i>	low/medium	FS
Apricot	<i>Prunus spp.</i>	low	FS
Cherry	<i>Prunus spp.</i>	low	FS
Chokecherry	<i>Prunus virginiana</i>	low	FS
Crabapple	<i>Malus spp.</i>	medium	FS
American Elm	<i>Ulmus spp. - DED resistant</i>	medium	FS
Hackberry	<i>Celtis occidentalis</i>	low	FS
Hawthorn	<i>Crataegus spp.</i>	low	FS
Honeylocust, thornless	<i>Gleditsia triacanthos spp.</i>	low	FS
Horsechestnut	<i>Aesculus hippocastanum</i>	low	FS

Japanese Tree Lilac	<i>Syringa spp</i>	low	FS
Linden, American or Little leaf	<i>Tilia spp.</i>	medium	FS/DS
Maackia, Amur	<i>Mackia amurensis</i>	low	FS
Maple, Norway or Freemanii	<i>Acer spp</i>	medium	varies
Mountain ash	<i>Sorbus spp</i>	medium	FS
Oak, Bur	<i>Quercus macrocarpa</i>	low	FS
Oak, Swamp White	<i>Quercus bicolor</i>	low	FS
Pear, no Bradford	<i>Pyrus spp</i>	low	FS
Plums	<i>Prunus spp.</i>	low	FS

Evergreen Shrubs and groundcovers

Common Name	Botanical Name	Water Needs	light
Juniper, common	<i>Juniperus communis</i>	low	varies
Kinnikinnik	<i>Arctostaphylos uva-ursi</i>	low/medium	DS
Oregon Grape	<i>Mahonia repens</i>	low	DS/S
Soapweed	<i>Yucca glauca</i>	low	FS
Curl leaf Mtn Mahogany	<i>Cercocarpus ledifolius</i>	low	FS

Deciduous Shrubs and Small Trees

Common Name	Botanical Name	Water Needs	light
Alder	<i>Alnus tenuifolia</i>	medium	FS/DS
Almond, Flowering	<i>Prunus glandulosa</i>	medium	FS/DS
Apache plume	<i>Fallugia paradoxa</i>	low	FS
Barberry	<i>Berberis spp</i>	medium	FS/DS
Bitterbrush	<i>Purshia tridentata</i>	low	FS
Buckthorn	<i>Rhamnus spp</i>	medium	FS
Buckthorn, Sea	<i>Hyppophae rhamnoides</i>	low	FS
Buffaloberry, Russet	<i>Shepherdia canadensis</i>	low	FS
Burningbush	<i>Euonymus alata</i>	medium	FS
Chokecherry	<i>Prunus spp.</i>	low	FS
Cliffrose, Mexican	<i>Purshia mexicana</i>	low	FS/DS
Coralberry	<i>Symphoricarpos spp</i>	low	FS
Cotoneaster	<i>Cotoneaster spp</i>	low	FS/DS

Cranberry, American	<i>V trilobum</i>	medium	FS/DS
Cranberry, European	<i>V opulus</i>	medium	FS/DS
Currant, golden	<i>Ribes spp</i>	low	DS/S
Deutzia	<i>Deutzia spp</i>	medium	FS
Red Osier Dogwood	<i>Cornus spp</i>	medium	FS/DS
Elderberry	<i>Sambucus spp</i>	low	FS
Fernbush	<i>Chamaebatiaria millefolium</i>	low	FS
Filbert	<i>Corylus spp</i>	medium	FS/DS
Forsythia	<i>Forsythia spp</i>	medium	FS
Gooseberry	<i>Ribes spp</i>	low	FS
Honeysuckle	<i>Lonicera spp</i>	low	FS
Hydrangea	<i>Hydrangea spp</i>	medium	DS/S
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	low	S/DS
Lilac	<i>Sryinga spp</i>	low	FS
Maple	<i>Acer spp</i>	medium	FS/DS
Mockorange or Syringa	<i>Philadelphus lewisii</i>	low	FS
Mormon Tea	<i>Ephedra viridis</i>	low	FS
Mtn Mahogany, Birch Leaf	<i>Cercocarpus montanus</i>	low	FS
Ninebark	<i>Physocarpus spp</i>	low	FS/DS
Oak, Gambel's	<i>Quercus gambelli</i>	low	FS
Peashrub	<i>Caragana spp</i>	low	FS
Plum	<i>Prunus spp.</i>	low	FS
Shrubby Cinquefoil	<i>Potentilla spp</i>	low	FS
Quince	<i>Chaenomeles spp</i>	medium	FS/DS
Rabbitbrush	<i>Chrysothamnus spp</i>	low	FS
Raspberry	<i>Rubus spp.</i>	low	FS
Rose, Woods	<i>Rosa woodsii</i>	low-medium	FS
Sagebrush	<i>Artemisia spp</i>	low	FS
Saltbush, Four Wing	<i>Atriplex canescens</i>	low	FS
Sandcherry	<i>Prunus besseyi</i>	low	FS
Serviceberry	<i>Amelanchier spp</i>	low	FS/DS
Snowberry	<i>Symphoricarpos spp</i>	low	FS
Spirea	<i>Spiraea spp</i>	medium	FS
Spirea, Ashleaf	<i>Sorbaria sorbifolia</i>	low	FS
Spirea, Rock	<i>Holodiscus dumosus</i>	low	FS

Sumac, Oakleaf	<i>Rhus trilobata</i>	low	FS
Summersweet	<i>Clethra alnifolia</i>	medium	DS/S
Thimbleberry	<i>Rubus deliciosus</i>	low	FS
Viburnum	<i>Viburnum spp</i>	medium	DS/S
Waxflower	<i>Jamesia americana</i>	low	FS
Winter Fat	<i>Cerotoides lanata</i>	low	FS

Grasses

Common Name	Botanical Name	Water Needs	height
crested wheat grass	<i>Agropyron cristatum</i>	low	12-18"
sideoats grama	<i>Bouteloua certipendula</i>	low	1-2'
blue grama	<i>Bouteloua gracilis</i>	low	1-2'
blue fescue	<i>Festuca ovina gluca</i>	low	4-10"
blue acenea grass	<i>Helictotrichon sempervirens</i>	low	4'
karl foerster feather reed	<i>C arundinacea 'Karl Foerster'</i>	medium	2-4'
norhern sea oats	<i>Chasmanthim latifolium</i>	medium	3-4'
hardy plume grass	<i>Erianthus (Saccharum) ravennae</i>	medium	9-12'

Grasses for Xeriscape

Common Name	Botanical Name	Water Needs	height
western wheat grass	<i>Agropyron smithii</i>	low	2-4'
blue grama grass	<i>Bouteloua gracilis</i>	low	1-2'
hairy grama grass	<i>Bouteloua hirsuta</i>	low	6-24"
kalm's chess	<i>Bromus kalmii</i>	low	2-4'
bluejoint	<i>Calamagrostis canadensis</i>	low	2-5'
prairie sand reed	<i>Calamovilfa longifolia</i>	low	2-6'
Canada wild rye	<i>Elymus canadensis</i>	low	2-5'
virginia wild rye	<i>Elymus virginicus</i>	low	2-4'
sheep fescue	<i>Festuca ovina</i>	low	1-2'
June grass	<i>Koeleria cristata</i>	low	1-2'
glaucous bluegrass	<i>Poa glaucifolia</i>	low	1-2'
inland bluegrass	<i>Poa interior</i>	low	1-2'
needle and thread	<i>Stipa comata</i>	low	1-3'

porcupine grasss	<i>Stipa spartea</i>	low	2-3'
purple top	<i>Tridens flavus</i>	low	3-5'

Flowers and groundcovers

common name	Botanical name	water needs	light
Aster	<i>Aster spp</i>	low	FS
Blanketflower	<i>Gaillardia aristata</i>	low/medium	FS/DS
Coneflower, purple	<i>Echinacea purpurea</i>	low/medium	FS/DS
Buckwheat	<i>Eriogonum spp</i>	low/medium	FS
Daisy, cut leaf	<i>Erigeron compositus</i>	low	FS
Geranium, sticky	<i>Geranium viscosissimum</i>	low/medium	FS/DS
Gilia, scarlet	<i>Gilia aggregata</i>	low/medium	FS/DS
Flax, wild blue	<i>Linum perenne</i>	low/medium	FS
Pussytoes, rosy	<i>Antennaria spp</i>	low	FS/DS
Yarrow	<i>Achillea millefolium</i>	low	FS
Penstemon	<i>Penstemon spp</i>	low	FS