

Water and Waterway Conservation



Principle: On-Farm Water and Waterway Conservation



Protection of Ground Water and
Fish Bearing Water Ways



Building Soil

5. Water and waterway conservation

Irrigation needs are required to be met based on strategies that emphasize water conservation. The following water conservation measures need to be demonstrably utilized to their maximum potential.

- Development of soil organic matter
- Mulching, in instances where mulching can be practically applied
- Efficient irrigation delivery systems where such systems can be practically applied
- Alternative pumping methods, such as solar pumps, nose pumps or wind pumps are considered
- The performance of irrigation system equipment is routinely monitored to verify motors, pumps and delivery systems are performing well and per specifications
- Irrigation scheduling takes into consideration crop requirements, daily rainfall amounts, soil types and evapotranspiration rates for the area.

Soil moisture is monitored to improve irrigation efficiency to avoid excessive water application

Waterways (applicable to USA farms with fish bearing waterways)

- When irrigating from native fish bearing waterways the following needs to be considered:
- Installing fish screens on diversions in accordance with appropriate state department of fish and wildlife or other similar guidance specific to the farms geographic location
- Avoiding channel manipulations that could negatively impact native fish populations
- Work on diversions, including installing and servicing pumps and intakes is conducted when sensitive native species are not present.
- If in stream work is done when there is water in the stream in stream sediment control and containment measures to prevent excessive sediment and construction debris from entering the water way.
- Irrigation ponds should not have adverse impacts on stream temperature and water quality.

Riparian, wetland and upland vegetation protection (applicable to USA farms with fish bearing waterways.

- When year round or seasonal waterways that are important habitat for native fish populations are present on the farm the following needs to be considered:
- Riparian zones or cultivation setbacks of year-round and seasonal waterways, potentially harboring native fish, are adequately vegetated and a minimum width of 35 feet.
- Wetlands are protected and wetland buffers established to the greatest extent operationally feasible. Wetland protection is prioritized to provide off-channel salmon habitat, improved water quality, additional floodplain storage, and/or other habitat benefits associated with proper wetland function. In dedicated agricultural production areas, wetlands are protected by a minimum 25 foot uncultivated buffer to the greatest extent operationally feasible.

Manure handling

Demeter certification requires that barnyard manure be carefully collected, preserved and composted. Collection storage and containment of manure/ urine must be done in a manner that does not lead to serious contamination of surface and ground water.

- Livestock confinement and manure storage facilities are designed to prevent any direct or indirect flow of manure into waterways or other surface waters.
- Storage facilities are not located in floodplains or areas with shallow groundwater tables and/or frequently moist or saturated soils.
- Clean water run-off from roofs, surface flows, and overflowing waterers are diverted away from manure piles.
- There is a manure storage management plan in place, taking into consideration a 25 year 24 hour storm event. Sufficient manure storage needs to be in place for 120 to 180 days of manure build- up, unless the operation has access to other environmentally acceptable methods to recycle manure nutrients (such as composting and/or biogas production).
- If manure and/or compost piles are less than 50' upland from a waterway the piles need to be covered during rainy periods and/or a leachate containment system is in place.



WHAT MAKES YOUR BIODYNAMIC FARM

Salmon-Safe?

Demeter USA is rolling out new standards incorporating "Salmon-Safe" guidelines to further protect water and wildlife.

LIVESTOCK

Pastures managed to prevent erosion, fence livestock from waterways, intensive rotation grazing, native plants restored.

WILDLIFE

Upland habitat conserved and connected to riparian areas, invasive plants controlled, barriers to wildlife movement removed, habitat for birds, pollinators, other wildlife.

STREAMS

Streamside buffers in place, wetlands protected, stream habitat restored.

Demeter and Salmon-Safe jointly developed this overlay for biodynamic growers by comparing Salmon-Safe's certification program with the U.S. Biodynamic farm standard. Salmon-Safe requirements are now embedded in the Demeter certification standards and will be required for ongoing certification. West Coast Biodynamic growers will have the ability to use the Salmon-Safe label in sales and marketing.

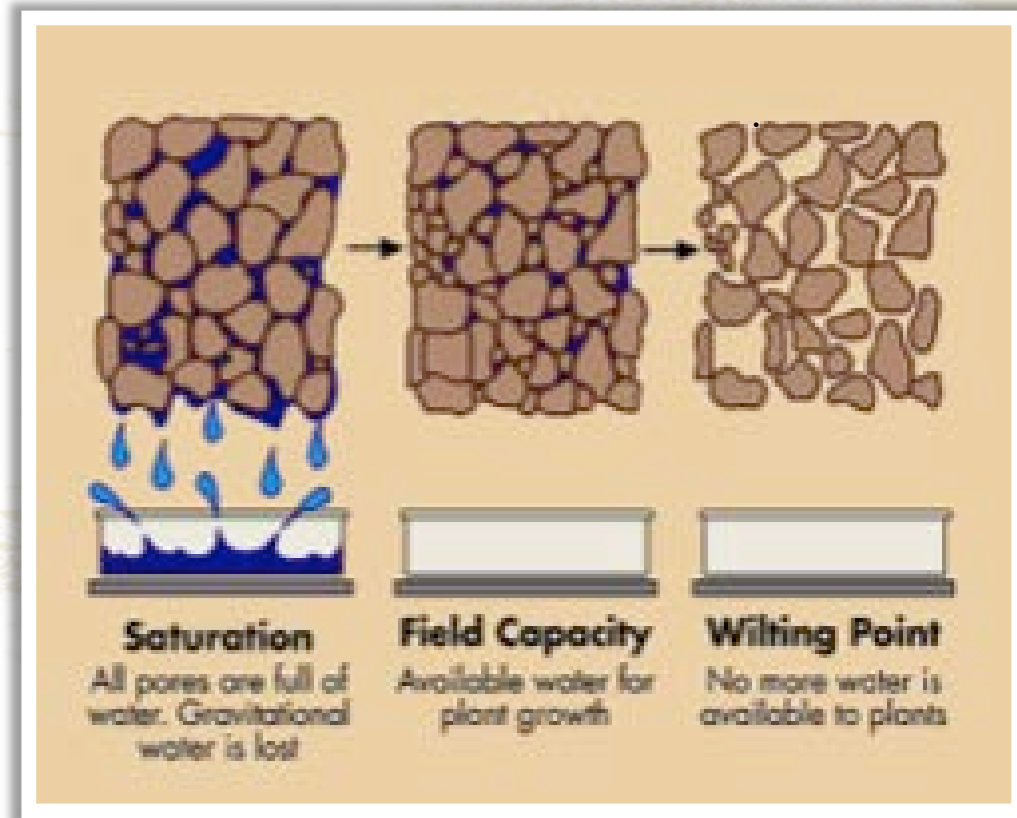
WWW.SALMONSAFE.ORG
WWW.DEMETER-USA.ORG

WATER

In-stream flows maintained for fish, fish screens on irrigation diversions, water use monitored, conservation measures in place.



Building Soil



Humus holds onto 90% of the moisture from a saturated atmosphere

Mulching



Grown and applied mulch



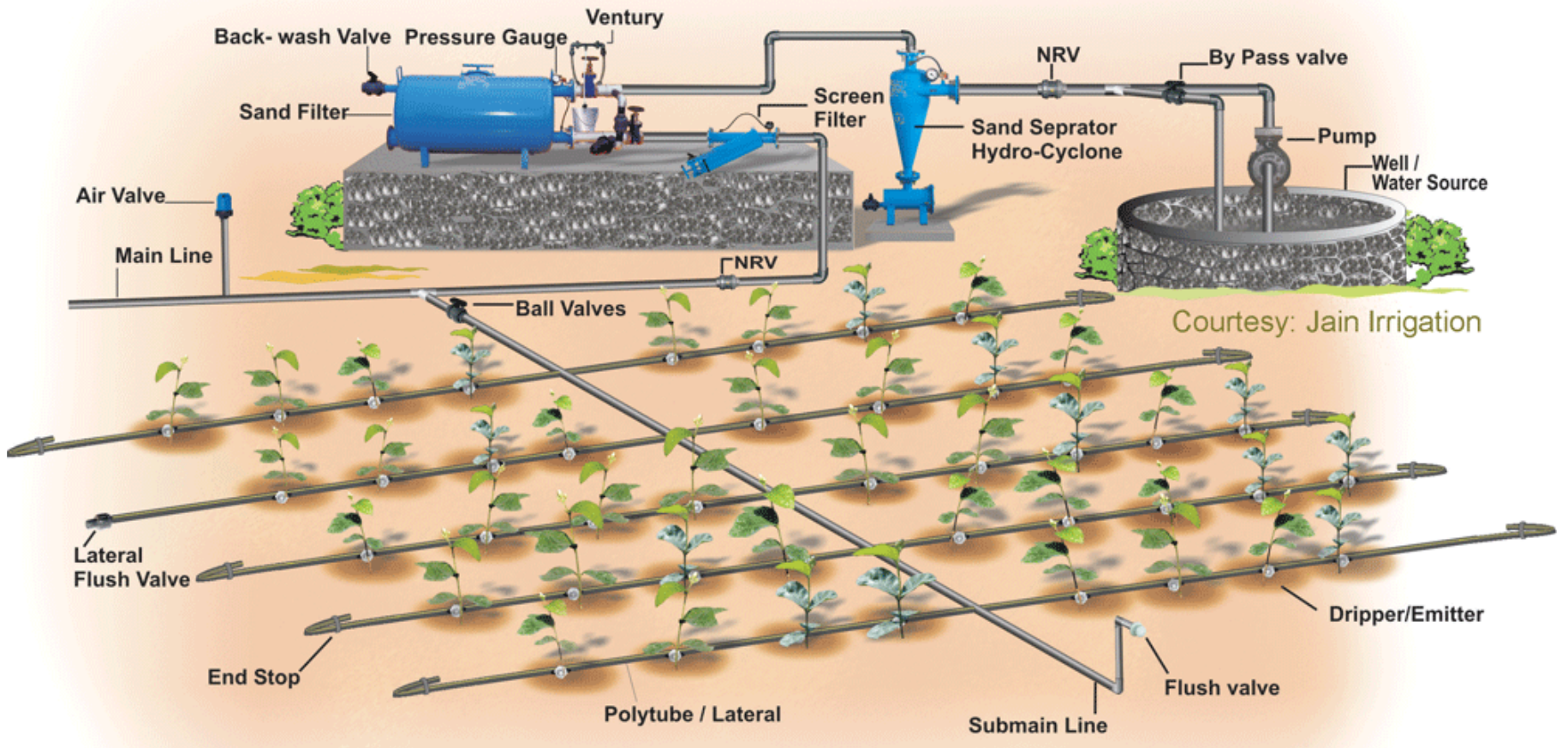
Crimp and roll no-till



Living Mulches

Some examples of on farm strategies of mulching for weed control:

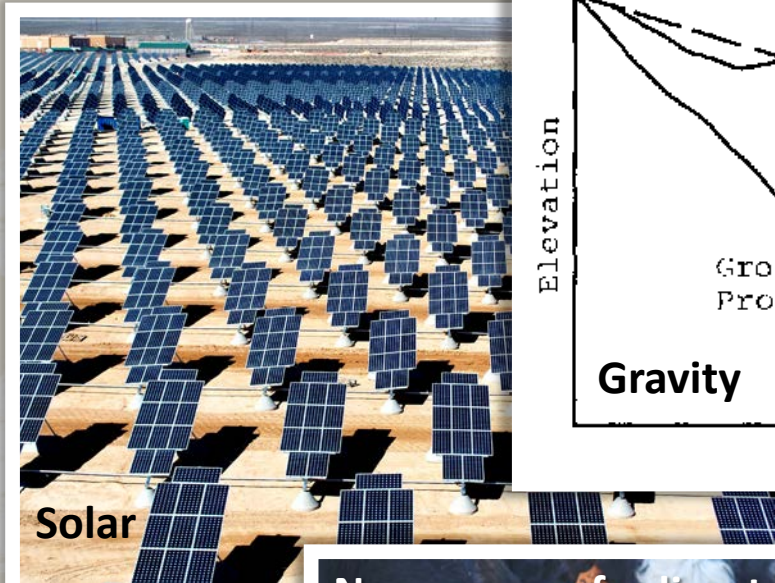
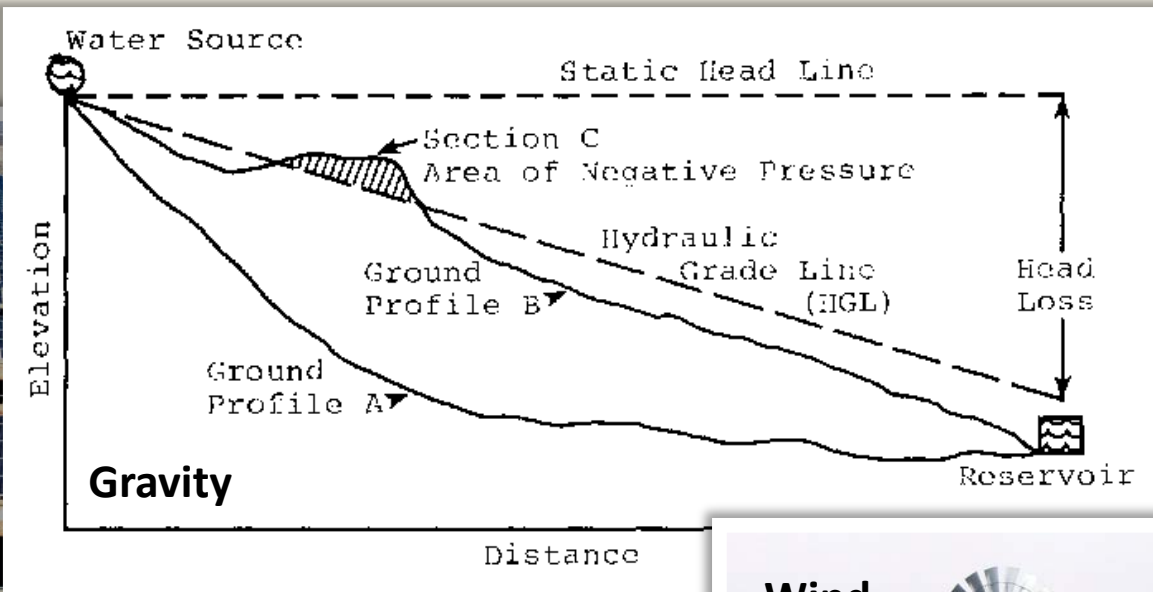
- 1) Growing and applying mulch materials such as harvesting grain straw or hay for mulch and mowing and blowing mulch materials directly in the field
- 2) Crimp and roll no-till. See <http://rodaleinstitute.org/our-work/organic-no-till/> Crops are drilled directly into a mat created by rolling and crimping cover crops planted and grown prior to seeding.
- 3) Living mulch- a desirable living cover is maintained and instead of tilling mowing or grazing is utilized to manage the cover.



Efficient irrigation delivery systems are used where such systems can be practically applied.

The performance of irrigation system equipment is routinely monitored to verify motors, pumps and delivery systems are performing well and according to specifications

Alternative Pumping Methods Considered



Soil Moisture Is Monitored

Irrigation scheduling takes into consideration crop requirements, daily rainfall amounts, soil types and evapo-transpiration rates for the area.

Soil texture	Field Capacity	Permanent Wilting Point	Plant Available Water Content
Well-structured clay	50	30	20
Clay	38	24	14
Loam	34	12	22
Sandy loam	23	9	14
Sand	9	2	7

Water storage ability of various soils (cm water in 1m depth).

Waterways



Installation of fish screens



Attention to channel manipulations and diversions to avoid negative impact to aquatic species



Irrigation ponds should not have adverse impacts on stream temperature and water quality.



Waterways

Riparian adequately vegetated minimum of 35 ft.





Waterways



In dedicated agricultural production areas, wetlands are protected by a minimum 25 foot uncultivated buffer.



Waterways

Manure Handling



Water run off diverted

Livestock confinement and manure storage facilities are designed to prevent flow of manure into waterways or other surface waters