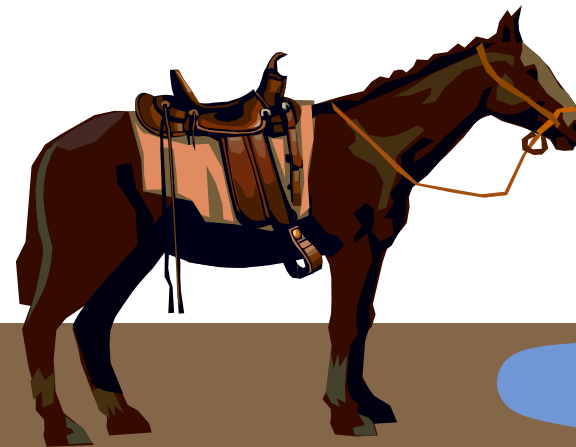


Mud & Manure

*A Management Guide for
Southern Oregon Horse Owners*



Healthy Horses, Clean Water

Healthy Horses, Clean Water

Illinois Valley SWCD
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www.ivstreamteam.org

A publication of the Illinois Valley
Soil & Water Conservation District

Introduction

Greetings from the Illinois Valley Soil and Water Conservation District

Hello, neighbor!

You don't have to live in Southern Oregon for long to know how many problems our wet winters can cause. If you are worried about taking care mud and manure, you are not alone!

Since 1949, the Illinois Valley Soil and Water Conservation District has helped land owners and farmers find the best ways to take care of their property. We are committed to working with you to find solutions that make your land productive while making sure our Valley's waterways stay clean and healthy. Luckily, taking care of mud and manure is a win-win situation: your horses benefit, and you are also keeping the water clean.

We hope this booklet will give you some ideas about how to take care of mud and manure on your land. But please don't stop there! Our professional staff can provide free help with planning and possibly paying for improvement projects.

We hope you will call us 541-592-3731, visit us online at www.ivstreamteam.org, or stop by our offices in the Josephine County Building, 102 S. Redwood Highway in Cave Junction.

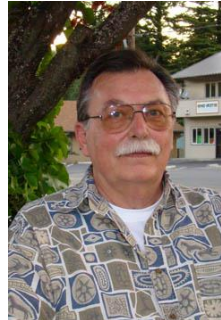
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Why protect water quality?

Healthy horse and clean water in action

Equines and the environment

1. No one likes dirty water.

Water that soaks through manure carries a mix of nutrients that can contaminate water supplies. Wells, streams, rivers, and groundwater can all be affected by manure run off. We all live downstream from someone. Doing your part to keep the water clean will benefit your neighbors.

2. Protecting water protects wildlife.

The Illinois Valley is a prime location for Salmon to spawn. Even if your property does not connect to a stream or a river, your water will eventually reach salmon-bearing waters. Keeping water clean improves habitat for salmon and other important wildlife species.



3. It's the law.

Oregon agricultural law has water quality standards: No one is allowed to cause any pollution of any waters of the state, nor is one allowed to place wastes in a location where they are likely to be carried into waters of the state (ORS 468b.025). By taking steps to keep manage mud and manure and keep your pastures healthy, you can meet these requirements.

Want to get involved with our efforts to help farmers and protect water quality?

Please share what you have learned about managing mud and manure with your friends and neighbors. Our office may be able to help with funding demonstration projects. We would also love to hear about your successes! We are always looking to share what has worked for others in the Illinois Valley.



How to manage rainwater

Constructing drainage systems & keeping clean water clean

Water runs downhill

1. Keep clean water clean.

Divert the rain that falls on the roof of barns and shelters. Using gutters and downspouts to re-direct this water reduces the water in your pasture and sacrifice area. It also keeps this water from being contaminated by manure and causing runoff pollution.

Water can be stored in rain barrels for future use of directed downhill and away from pastures and heavy-use areas.



2. Protect drain fields and well heads.

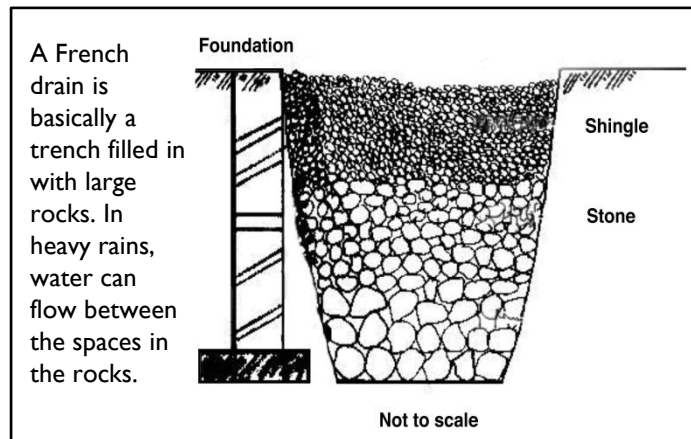
Your pasture is a place for your horse, not for your drain field or well head. When the two mix, manure can enter your drinking water. The soil around your drain field can be compacted, causing drainage problems.

3. Consider buffer strips.

Create an ungrazed strip of grass or trees around the outside of your pasture. During heavy rains, these buffer areas can prevent soils that may wash away from travelling too far. Buffer strips also help protect water quality by trapping potential pollutants.

4. Drainage systems.

In especially wet areas, you might consider adding small ditches, drain tile, or French drains to direct rainwater away from your sacrifice area or other important areas on your farm. Since ditches and French drains are open to the air, they are often a cheaper solution than underground drain tile. To prevent erosion, they may need to be lined with gravel.



What is mud?

Understanding the problem

Mud = soil + water + organic material

Mud is formed when soil, water, and small bits of organic material combine to create a sticky, goeey, muddy mess. **Southern Oregon's horse pastures are the perfect place to make mud.** Soil in the ground, manure from your horse, and winter rains are all mixed together by trampling hooves. All of a sudden, you have a mess on your hands.

There's not much we can do about soil or rain, but **taking care of manure**—the organic material in paddock mud—**can help control mud.** This booklet covers 7 components of mud and manure management:

- **Why is mud a problem?** p. 3
- **How to deal with muddy pastures** p. 4
- **How much manure do horses create, and what can you do to manage manure?** p. 5-6
- **Should you compost your manure?** p. 7-8
- **Constructing a sacrifice area** p. 9-12
- **Managing rainwater** p. 13
- **Why protect water quality** p. 14

Use this booklet as a starting place for coming up with a plan to effectively manage mud and manure on your property. Your local Soil and Water Conservation District can help you develop this plan and connect you with resources for improvement projects.

Want to learn more about the Illinois Valley Soil and Water Conservation District?



Just ask! Please feel free to call our office at **(541) 592-3731**. If you are in the area, we would love a visit! Our offices are in the Josephine County Building, 102 S. Redwood Highway, Cave Junction, OR.

You can also find us online at <http://www.ivstreamteam.org>. Visit our website to read about past projects, upcoming events, our organization's history and mission, and more.

We look forward to hearing from you!

Why manage for mud?

Understanding the problem

Horses+ Mud = Problems

1. Mud makes chores a mess.

It is no fun—for you or for your horse—to have to wade through mud! Everyday chores can be easier to complete when mud is kept under control.

2. Mud and manure are a breeding ground for flies.

Decaying piles of manure can be an ideal place for stable flies to deposit their eggs. Though your farm will always have some flies, you can reduce their numbers by quickly removing and properly storing manure.

3. Mud can lead to infections.

Manure contains the eggs from internal parasites, and they can cause re-infection when your horses' food comes in contact with manure. Muddy wet, pastures contribute to horse infections.

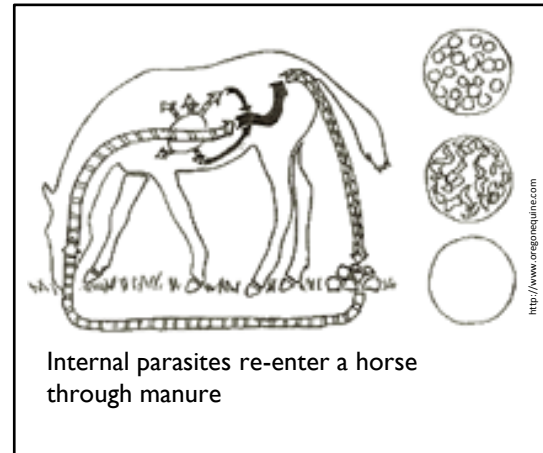
Rain rot/rain scald is caused by an organism that lives in warm, damp conditions. Also, the bacteria that causes thrush leads to infection when trapped in a horse's hoof along with moisture.

5. Mud is messy!

Taking care of mud and manure on your horse property can make your farm a more beautiful place!

3. Muddy water runs into our groundwater, streams, and rivers.

Many farms receive water from wells. Contamination from horse manure can enter groundwater or cause pollution as it runs into waterways. We all live downstream from someone! Your neighbors will appreciate your efforts to keep mud under control, too.



Internal parasites re-enter a horse through manure

Constructing a sacrifice area

Choosing materials

Footing	Notes	Pros	Cons
Gravel	Rocks smaller than 5/8" to protect horses' hooves	Drains well; long-lasting	High initial cost; large rocks can cause problems
Hog Fuel/Mulch	Use only evergreen wood, as some deciduous trees can be toxic to horses	Inexpensive; helps reduce urine odor	Decomposes and must be replaced ~3 years
Sand	Best for sites with no slope & well-draining soil	Inexpensive	Works into soil and must be added frequently; feeding on hay can cause colic
Plastic grids	Brand names include HoofGrid, Stabiligrd, EcoGrid	Durable, long-lasting and effective	Can be very expensive
Geotextile fabric	Can be used with gravel, sand, and hog fuel to keep material from working into soil	Effective	Higher initial cost



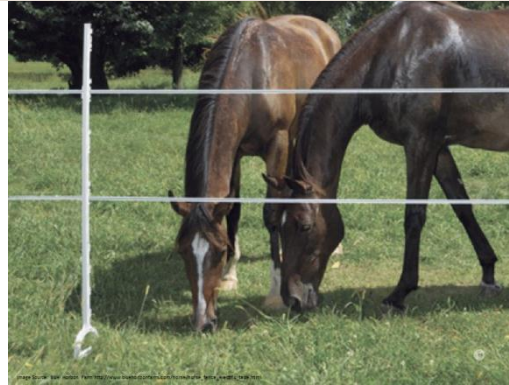
Left: Geotextile fabric is unrolled underneath gravel footing. Above: EcoGrid, a plastic footing grid

Constructing a sacrifice area

Choosing materials

2. Fencing

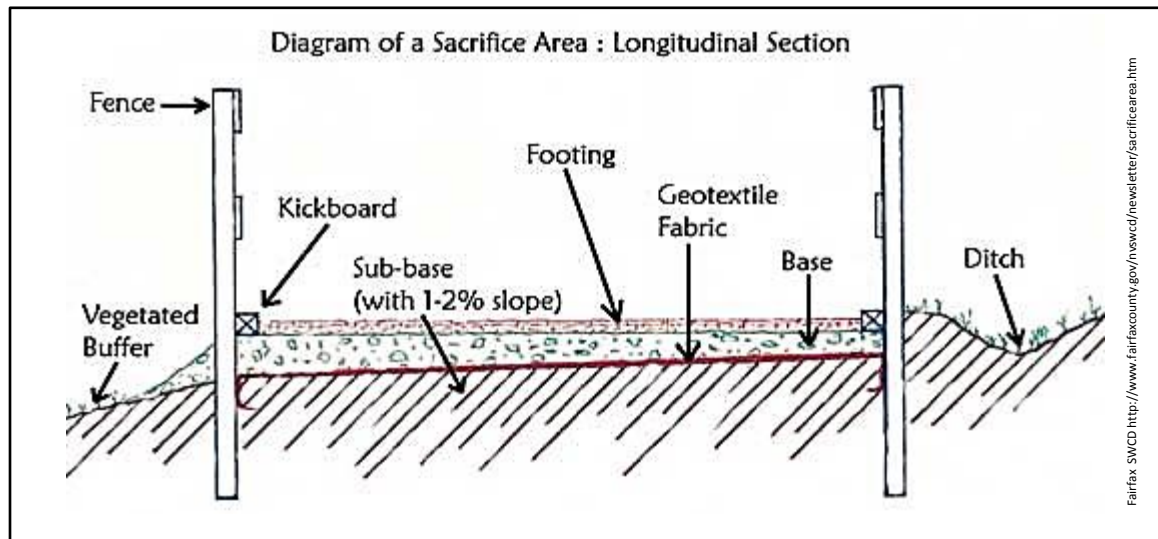
For horse safety and security, design your pastures with a permanent sturdy exterior fence, built of wood, PVC or non-climb fencing. Interior divisions can be created with white electric pasture tape, a low-cost yet effective fence option that can easily be moved if necessary.



3. Footing

What you decide to put on the ground in your corral/sacrifice area is a matter of cost, availability, horse health, and chore efficiency. Ideally, the site of your sacrifice area will be mostly flat. The drawing below shows how footing material can be used to help keep water from pooling. Outside the sacrifice area, drainage ditches (p. 13) and vegetated buffer strips (p.13) can help take care of water runoff.

Several options for footing are summarized in the chart on the opposite page. Investing in Geotextile fabric to lay below your footing can help keep material from working into the soil.



What about muddy pastures?

Mud and manure on the 'open range'

Mud can be a special concern when it covers more than just the heavy-use areas where horses access food, water, and shelter.

1. More space = more mud = more problems.

When pastures become as trampled and muddy as small holding areas, environmental concerns, like pollution and runoff, are multiplied. Muddy pastures can also lead to future problems with weeds and poor grass growth.

2. Protect your pasture by using a paddock or sacrifice area.

If a pasture is too wet to drive on, it is too wet for your horse! Prevent future pasture problems by placing your horse in a smaller "sacrifice area" when soils are wet. **Learn more about sacrifice areas on pages 9-12.**

3. Prevent weeds.

Muddy, trampled pastures are the perfect starting place for weeds. Weeds can germinate in upturned soil and gain an early advantage from the moisture as muddy pasture dry out. Planning ahead to protect wet pastures can help prevent future weeds from being established.

A closer look at flies and mud:

Common house flies, stable flies, and face flies lay eggs in warm, moist organic material—exactly what the mud in horse pastures is made of! The best way to control flies is to eliminate places where flies can lay eggs and reduce the manure that attracts adult flies.

Covering your manure pile or compost pile can help keep flies out. It also can make the pile's temperature hot enough to kill eggs from flies and horse parasites.

In open pasture, dragging fields with a weighted wooden pallet, box spring, or harrow can break up clumps of manure and reduce fly breeding grounds. If your horse is regularly dewormed, this will not spread parasites.

The University of CA offers pest control information online at <http://www.ipm.ucdavis.edu/> You can also receive their fly control factsheet by contacting the IVSWCD office.



How much manure do horses create?

How to reduce your workload

One horse produces 50 lbs of manure per day!

That's a lot to deal with. Here are some management tips:

1. Set yourself up for success!

Store shovels, rakes, and wheelbarrows where you need them. Locate manure piles where they can be reached. Sometimes an outside opinion can help spot ways to make your chores more efficient. Ask a friend or neighbor or IVSWCD planner for their ideas!

2. Remove manure regularly.

Pick up manure at least every three days—this is the time it takes for insect larvae to hatch from eggs. When manure is collected frequently, the work is easier to accomplish.

3. Don't over-use bedding.

Although it is important to remove manure frequently, do not remove more bedding than necessary! By picking up only dirty bedding, you can lower the amount of work you need to do—and save space in your manure storage! Experiment with how much bedding is necessary. A thin layer is often enough.



Malene Thyssen, <http://commons.wikimedia.org/wiki/User:Malene>

4. Store manure safely.

Although it is a concern, small manure piles are unlikely to catch fire. Keeping piles small and providing enough oxygen for the manure to “breathe” (sticking PVC pipes are into the pile is a simple, effective way to do this). Additionally, do not store manure near waterways or in areas with poor drainage. Watch where water travels on your property, and store manure somewhere else to protect water quality.

Constructing a sacrifice area

What to consider and where to learn more

- C. **Buffer zones.** Because sacrifice areas are constructed with manure, mud, and run-off in mind, they should be in a location where they will not affect waterways. Do not place a sacrifice area next to a stream, river, irrigation ditch, or well head. You can help control runoff by keeping a **buffer** of un-grazed grasses around the sacrifice area. The size of the buffer depends on your property.

A few feet of ungrazed pasture around a stream or river can make a big difference in controlling pollution. Here is an example of a buffer along a cattle pasture; barbed wire is not recommended for horse fencing.

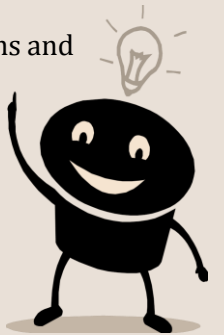


A sacrifice area is a big project. Where to learn more:

Oregon State University's Extension Service has created “Managing Small Acreage Horse Farms”, a comprehensive guide for horse owners. This guide can be found online at extension.oregonstate.edu and at the IVSWCD office.

Horses for Clean Water offers multiple examples of demonstration farms and sacrifice areas at www.horsesforcleanwater.com

Soil and Water Conservation District staff can offer help with planning and finding funding for constructing your sacrifice area.



Constructing a sacrifice area

What to consider when you are planning

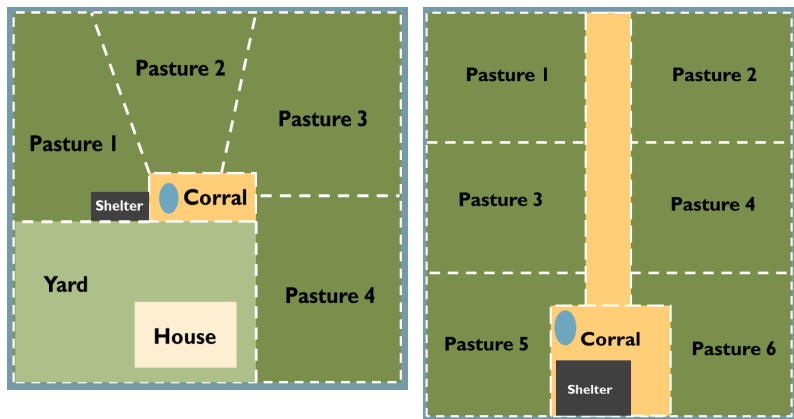
Setting aside part of your pasture as a “sacrifice area”, or heavy-use paddock, can contain problems with mud and manure to a manageable size. Sacrifice areas are used whenever your pasture cannot support livestock, typically when the ground is too wet or the grass is too short to be grazed.

1. Layout

When deciding on a layout for your pastures and paddock/sacrifice area, there are a few things to consider. These designs are created to use with a rotational grazing, a technique that improves pasture quality. (You can learn more about rotational grazing online or in the “Pasture Management” Healthy Horses Clean Water factsheet.)

A. Access to water and shelter. You might arrange your farm so that all pastures connect on a central location for shelter and water, or it might be necessary to add additional watering sites.

There are many options for designing a sacrifice area. Take the time to sketch out a few possibilities before you make your final decision. Make sure to avoid drainage paths and naturally “wet” areas on your property. Here are a few ideas to get you started:



B. Location, location, location. Your sacrifice area should be located for easy access for chores and manure storage. It’s also important to consider drainage—constructing a sacrifice area at the bottom of a hill will do you no favors for controlling mud!

Making a plan for manure

What to do with what’s left

There are many ways to reduce the amount of manure you deal with, but it will never disappear completely.

1. Consider composting.

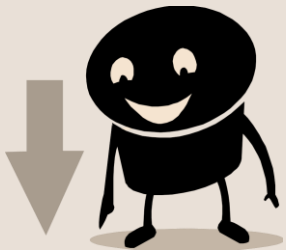
Composting manure can turn waste into “black gold”. Manure that has been properly composted no longer holds weed seeds or parasite eggs and can safely be added to your pasture or garden. Plus, composting reduces the size of your manure pile by 50% and turns what is left into something useful. Compost is free fertilizer!

2. Use the Southern Oregon Manure Exchange!

The Manure Exchange connects people who have manure and people who need manure—composted or fresh, it’s up to you. The Manure Exchange serves Jackson and Josephine Counties. Find the link at <http://www.jswcd.org> You can also advertise manure in the classifieds or on Craigslist, donate it to neighbors or local gardeners, or pay someone to haul it away.

Looking for more ideas on decreasing the size of your manure pile?

All horse owners have to deal with manure, and it is a popular topic online. www.thehorse.com has many articles on manure management. The pictures of demonstration farms at www.horsesforcleanwater.com provide examples of ways other Northwestern horse owners deal with manure.



What you choose to do with your manure has a lot to do with your farm, however. Sometimes, individual information is best and having a fresh set of eyes can provide new ideas.

The Illinois Valley SWCD offers free on-farm consultations. We would be happy to join you in researching solutions. We can suggest ways to store and compost manure, how lay out your horse pasture so chores are as easy as possible, help you identify toxic weeds, and more.

Should you compost your manure?

Turning waste into fertilizer safely

You have to do something with manure. Is composting a good fit?

1. Pros and cons of composting

Composting can take manure, a waste product, and make it valuable for fertilizer or for resale. Composting can reduce the size of manure piles. When done correctly, composting does not create odors or produce runoff. It does, however, require some investments. You must create a structure to store manure while it composts, and you must manage your compost.

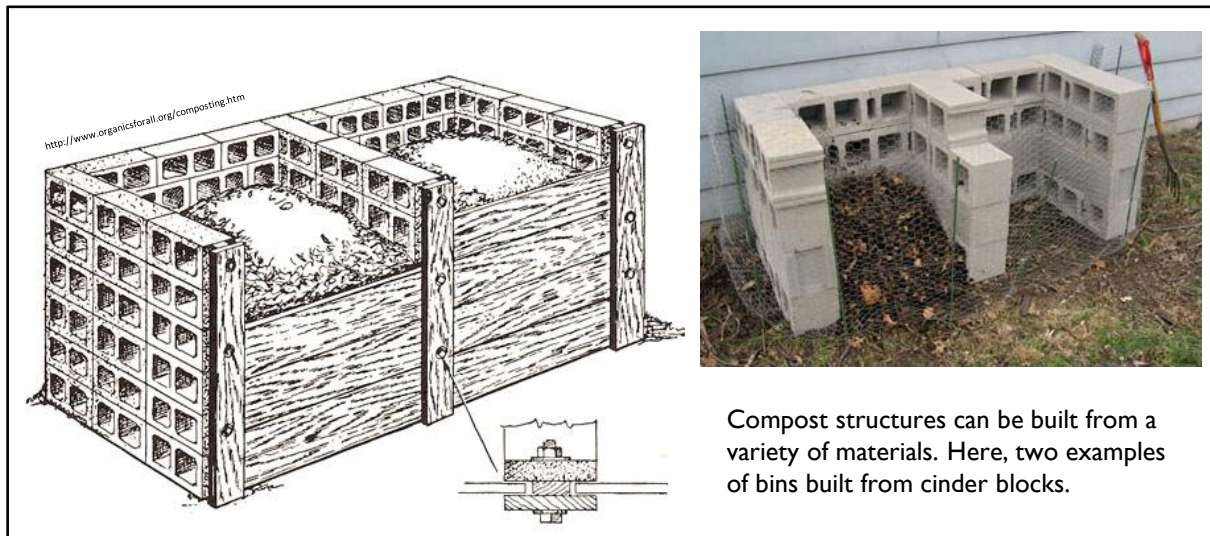
2. Compost Structures

A compost structure can be as simple as a tarped pile on a concrete slab or as sophisticated as a separate shed with wheelbarrow ramps and adjustable bin sizes. Designs can be found at your local SWCD office as well as online.

It is important that the structure be large enough to hold manure for six months while composting. 3-bin structures allow separation of fresh manure, composting manure, and finished compost. Here are some simple ideas to get you started.

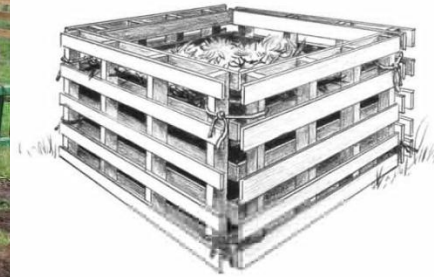
3. Using compost

Finished compost can be spread on your pasture in spring or early fall. If you have too much or too little compost, consider using the **Southern Oregon Manure Exchange**. See page 6 for more information.



Compost structures can be built from a variety of materials. Here, two examples of bins built from cinder blocks.

How to build a compost structure



Compost structures can also be built from simple wooden pallets, ventilated with PVC pipes, and covered with a tarp.

Where to learn more about composting manure:

These factsheets are available online through search engines and at the IVSWCD Offices:

- “Composting System for Small Horse Farms” –Oklahoma Cooperative Extension Service, online at <http://osufacts.okstate.edu>
- “Composting for Small Scale Livestock Operators” –Northeast Recycling Council, www.nerc.org
- “Managing Horse Manure by Composting” —from *Manure and Pasture Management for Horse Owners*, Alberta Agriculture and Rural Development

Need help designing or paying for a manure compost structure?



Please let us know! The Illinois Valley Soil and Water Conservation District’s goal is to help landowners take care of their land while protecting our natural resources. We have many designs on hand for places for composting your manure. Our staff will work with you to find an effective, affordable solution, and we may be able to provide assistance for purchasing materials.