Manure and Mud Management

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OSU Extension Service
What we’ll cover...

- Benefits of Manure and Mud Management
- Different practices and possibilities
- Resources for assistance
Good reasons for M&M Mgmt

- Get a handle on the “mud”
- Benefits to the animals
- Environmental protection
- Pasture Improvements
Cost of Mud: Animal

- The effect of rain, wind, and mud on feedlot cattle performance

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Initial weight</th>
<th>ADG</th>
<th>Feed intake</th>
<th>Feed gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete, wind, rain</td>
<td>648</td>
<td>2.77</td>
<td>22.2</td>
<td>8.01</td>
</tr>
<tr>
<td>Concrete, wind</td>
<td>634</td>
<td>3.23</td>
<td>20.8</td>
<td>6.44</td>
</tr>
<tr>
<td>Concrete, shelter</td>
<td>654</td>
<td>3.44</td>
<td>22.0</td>
<td>6.44</td>
</tr>
<tr>
<td>Mud, shelter</td>
<td>658</td>
<td>2.67</td>
<td>20.0</td>
<td>7.49</td>
</tr>
<tr>
<td>Mud, wind</td>
<td>625</td>
<td>2.47</td>
<td>19.7</td>
<td>7.97</td>
</tr>
</tbody>
</table>

From 9th California Feeders’ Day, 1969, University of California
Cost of Mud: Animal

- Gain in mud
- Calf Scours
  - Calf
  - Udders
- Scald leading to footrot

<table>
<thead>
<tr>
<th>Mud Depth</th>
<th>Potential Loss of Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>No mud</td>
<td>0%</td>
</tr>
<tr>
<td>Dewclaw-deep</td>
<td>7%</td>
</tr>
<tr>
<td>Shin-deep</td>
<td>14%</td>
</tr>
<tr>
<td>Below hock</td>
<td>21%</td>
</tr>
<tr>
<td>Hock-deep</td>
<td>28%</td>
</tr>
<tr>
<td>Belly-deep</td>
<td>35%</td>
</tr>
</tbody>
</table>

*Source: Kansas State University, University of Nebraska*
Cost of M & M: Environment

- Sediment
- Bacteria
- Flowing to streams
Sacrifice Area

- Small area that is going to be “sacrificed” to save the rest of the pastures
- Choose a smart location—close to barn, feeding area, etc…
  - Rocky, hillside area, low productivity
- Over seed annual ryegrass in spring
Improved Sacrifice Area

- Site is prepared for heavy use
- Scrape away accumulated manure, mud and organic material
- If possible, gently slope the land, 1 to 2 % away from barn
Popular Footing Options:

- **Hog fuel**
  - Wood chips, shredded bark, fairly inexpensive, packs down and decomposes, 6” minimum, 12” is better. Decomposes with time. Add a new layer every 1 -2 years.

- **Gravel**
  - 6 to 8”. Larger gravel (3” minus, possible pit run) for base, with ¾” minus on top.

- **General rule of thumb**
  - Min. of 2:1 ratio of footing to mud.
Where’d the gravel go?
Geotextile Fabrics

- Synthetic material, filter fabric
- Small holes so that water can pass through, but not soil particles
- Soil stability and load distribution
- Provides separation
  - Prevents the base material from mixing with the footing material
Rock & Geotextile Fabric Specs

- Details in “Using All-Weather Geotextile Lanes and Pads” (MWPS, AED-45)
- http://www.mwps.org/
- Select “Construction on the farm”
Exercise Area

Protect the pasture:
Fence off a “run” or “track”
for exercising horses. Use pasture carefully.
Other Heavy Use Areas

- Area around
  - water troughs
  - gates
  - barn
Animal Walkways

- Prevent
  - Compacted soil in summer
  - Mud in the winter
Portable Feeding Area

- Reduce mud and manure accumulating in any one place
- Place feeding area away from water resources
Keep “Clean” Water Clean

- Divert water drainage away from your barn and sacrifice areas
  - Use berms to create a physical barrier
  - Water bars (speed bumps)
  - Drain tiles

- Caution: Divert only clean water. Waste water diversion requires a permit
Tools To Divert Water

- Drain Tile
- Drainage Ditch
- Culverts
- Caution: Rules and Regs
Rain Gutters and Downspouts

- The Problem
  - 1” of rain on a 20’x50’ barn roof produces 620 gallons of water.
  - 40” of rain per year
  - 25,000 gallons of extra water!
Rain Gutters and Downspouts

- Install gutters and downspouts on roofs that contribute to the mud problem.
- Be sure to direct the downspouts away from sacrifice areas.
- Protect the downspouts from damage.
Keeping Water Clean

- Use vegetation and fencing to protect sensitive areas
  - Grass waterways and buffer strips
  - Use plants to utilize water
    - Willows, cottonwoods, red-osier dogwood
Fencing

- Sensitive areas like streams and rivers
- Around the wellhead
Using Riparian Areas

- Unused/unmanaged areas revert to weeds
  - Use appropriate weed control

- Make riparian pastures

- See Handouts
  - Graze at appropriate time
  - Graze at appropriate intensity
Well-head fenced off
Buffer Strips

- Grass and/or other vegetation
  - Adsorbs excess nutrients
  - Catches sediment
- Down slope of heavy use areas
- Along streams and other waterways
- Around wellheads
Vegetative Strips

What practices would be good here?
Off Stream Watering

- Reduces stream bank erosion
- Keep your soil!
- Helps prevent bacteria and nutrient contamination in water
- Provides clean water for animals
Not Good!
Better!
Even Better!

See handout on “Livestock Watering Alternatives”
Put the cattle to work--

Cattle learn to use the nose pump to get water.
Average daily gain: Dugout versus trough water

Bohnert (2009)
Collect and Store Manure

- Not just behind the barn!
- Find a “safe” place
  - Area away from water
  - Compacted gravel area
  - Concrete pad
  - Covered storage facility
Cover Manure Pile

- Cover pile during the rainy season
  - Prevents nitrate-nitrogen from leaching to drinking/groundwater.
  - Prevents bacteria from contaminating water
Composting can kill parasites and weed seeds.

See Publications:
Manure and Compost Facilities
Composting (OSUES - EM 8825)
Composting Livestock Manure (WSU)
Utilize Manure Resources

- Applying manure increases soil nutrient value and organic content
- Apply when plants can use it
  - Unsaturated soils
  - Growing weather
- Buffer from water
- Away from natural drainages
Low Cost Fertilizer!

- Cattle manure is a good source of Phosphorus
Fertilizer Value

- Manure Source (animal type)
- Storage conditions
- Application technique

See publications

- Fertilizers and Lime Materials (FG 52)
- Fertilizing with Manure and Other Organic Amendments (EM533)
Soil Fertility Status

Current

Required
Soil Testing

- How to take a soil sample
- List of Laboratories
- OSU Fertilizer Guides
- Consultations by OSU
Need some assistance?

- Local Extension service
- For cost-sharing and technical assistance
  - Soil and Water Conservation District (SWCD)
  - Natural Resource Conservation Service (NRCS)
QUESTIONS?
Publications

- [https://extension.oregonstate.edu/crop-production/pastures-forages](https://extension.oregonstate.edu/crop-production/pastures-forages)
- [http://pubs.cahnrs.wsu.edu/learn/](http://pubs.cahnrs.wsu.edu/learn/)