CONSERVING ROUND BALE QUALITY DURING OUTDOOR STORAGE

July 16th, 2020

OSU Ranchers Thursday Lunchtime Series

Dr. Kevin Shinners

University of Wisconsin – Madison
Hay Loss Perspective

<table>
<thead>
<tr>
<th>Storage Method</th>
<th>Range of Dry Matter Loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under Roof</td>
<td>2 - 10</td>
</tr>
<tr>
<td>Covered, rock pad or elevated</td>
<td>2 - 17</td>
</tr>
<tr>
<td>Uncovered, rock pad or elevated</td>
<td>3 - 46</td>
</tr>
<tr>
<td>Uncovered, on ground, net wrap</td>
<td>6 - 25</td>
</tr>
<tr>
<td>Covered, on ground</td>
<td>4 - 46</td>
</tr>
<tr>
<td>Uncovered, on ground</td>
<td>5 - 61</td>
</tr>
</tbody>
</table>
HAY LOSS PERSPECTIVE

$120

$12

$17

$29
**TAKE HOME MESSAGES**

- **To Conserve Quality During Storage:**
  - ✓ Start with “Baling Smart”:
    - Dense bales, leaves saved, net wrap
  - ✓ Finish with “Storing Smart”:
    - Well drained, slight slope, N-S direction, not stacked, exposed to sun
STORAGE SPACE VS CONSERVATION
• Bale Shape and Density

✓ Advantages of dense bales:
  • Fewer bales to handle & transport
  • Less squat, rejected hay

✓ Making dense bale:
  • Starts with core
  • Drag on sidewall
WEATHERED LAYER

6 ft. Bale

Outer 2 in. 11%

Outer 4 in. 21%
WEATHERED LAYER

5 ft. Bale

Outer 2 in. 13%

Outer 4 in. 25%
**Bale “Thatch”**

- **Thatch**

  ✓ Leaves form the bale thatch:
  
  - Grasses with wide leaves forms better thatch than alfalfa
  
  - Wrapping with net saves alfalfa leaves

<table>
<thead>
<tr>
<th></th>
<th>Wrapping time (sec)</th>
<th>Wrapping loss (% of DM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net</td>
<td>$22_a$</td>
<td>$1.0_a$</td>
</tr>
<tr>
<td>Twine</td>
<td>$75_b$</td>
<td>$2.9_b$</td>
</tr>
</tbody>
</table>

Shinners et al., 2007
Bale “Thatch”
MOISTURE DISTRIBUTION
OUTDOOR STORAGE OPTIONS

Single Rows  Pyramid  Mushroom

Round Bale Storage Conservation

Updated June 23, 2020

Written collaboratively by Sara Bauder, Tracey Erickson, and Kevin Shinnere

https://extension.sdstate.edu/round-bale-storage-conservation
INDOOR STORAGE

Moisture %

[Color gradient diagram showing distribution of moisture in indoor storage]
SINGLE BALE OUTDOORS
Bales Stored in Rows
BALES STORED IN ROWS

MOISTURE %
Bales Stored in Rows - Touching
Bales Stored in Rows - Touching

Moisture %
MUSHROOM STACK
MUSHROOM STACK

MOISTURE %
Pyramid Stack
DRAINAGE

Well Drained

Poorly Drained
DRAINAGE
TWINE VERSUS NET WRAP
# Twine versus Net Wrap

<table>
<thead>
<tr>
<th></th>
<th>1(^{st}) Cutting (149 days)</th>
<th>2(^{nd}) Cutting (356 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sisal Twine</strong></td>
<td>16.3(_c)</td>
<td>22.9(_c)</td>
</tr>
<tr>
<td><strong>Plastic Twine</strong></td>
<td>9.0(_b)</td>
<td>15.1(_b)</td>
</tr>
<tr>
<td><strong>Net Wrap</strong></td>
<td>6.8(_a)</td>
<td>8.0(_a)</td>
</tr>
</tbody>
</table>

Shinners et al., 2007
BEST STORAGE PRACTICES

- Net wrapped, good thatch
- Gentle slope, well drained
- No shade, Rowed N–S Southern Exposure
- At least 3 ft. between rows
- Vegetation managed
STORAGE ALTERNATIVES
TAKE HOME MESSAGES

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