Advantages and Challenges of Multi-species Grazing

Randy Saner
Extension Educator
Multi-species grazing

- To control weeds and brush, while yielding more pounds of gain per acre.
- To increase carrying capacity of pasture.
- To control parasites.
- To diversify income.
- To reduce predation.

Cattle, sheep, and goats have complementary foraging behavior.

Sheep/goats and cattle and horses generally do not share the same parasites.

Image: Missouri NRCS
Decrease Risk

• Disease
  • Break Each Others Parasite Cycles
  • Very Few Diseases that Cross Species

• Drought

• Marketing
  • More Opportunities to Sell

Image: Terrell Ranch
Decrease Overheads

- Labor
  - Fence
  - Fall and Winter Cattle Work
- Land
- Add one Ewe or Doe per cow
Harvesting Multiple Layers Off the Same Land

- Decrease Marketing Risk
- Increase Diversity
- Spread Out Labor and Other Overheads
Adding Sheep or Goats to a Cattle Operation

- Profitable
- Labor Management
- Wool
- Family Friendly
- Positive Range Impact
- Enterprise Stacking
- Meet New People
- Fencing

- H2A Program
  - Bringing in a trained work force
- Guard Dogs
  - Reduce predator loss
- Cold May Rains can be a problem
- Lamb with wool on if in pasture
- Prejudice Against Sheep
- Steep Learning Curve
Double M Farms (Mixed Livestock Operation)

- 40 (1200lbs.) cows 230 (130lbs.) ewes and 40 (130 lbs.) does on 400 acres  7.5 ewes = 1 AU 7.5 does = 1 AU and 1 cow = 1.3 AU
- Pasture based rotationally grazed pastures at two locations 3 miles apart
- 16 paddocks (240 acre)
- 13 paddocks (160 acres)
- 48,000 lbs. of cattle, 29,900 lbs. of sheep and 5,200 lbs. of goats
- 83,100 lbs. on 400 acres = 207.75 lbs. per acre stocking rate
- By using rotational grazing and multi species you are able to have more lbs. sold per acre on the same land.

AU = Animal Unit 1,000 lbs.
### Gross Income/ Brood Stock A. U. Double M Farms

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Ave</strong></td>
<td>$685</td>
<td>$740</td>
<td>$1026</td>
<td>$947</td>
<td>$1375</td>
<td>$1351</td>
<td>$1725</td>
</tr>
<tr>
<td><strong>Does</strong></td>
<td>$221</td>
<td>$752</td>
<td>$435</td>
<td>$1137</td>
<td>$983</td>
<td>$694</td>
<td>$1137</td>
</tr>
<tr>
<td><strong>Ewes</strong></td>
<td>$1067</td>
<td>$850</td>
<td>$1459</td>
<td>$1687</td>
<td>$1530</td>
<td>$1491</td>
<td>$1926</td>
</tr>
<tr>
<td><strong>Cows</strong></td>
<td>$448</td>
<td>$659</td>
<td>$764</td>
<td>$587</td>
<td>$578</td>
<td>$888</td>
<td>$704</td>
</tr>
</tbody>
</table>

|                |       |       |       |       |       |       |       |
| $ gross income per acre | $129 | $152 | $145 | $169 | $176 | $232 | $229 |

<table>
<thead>
<tr>
<th></th>
<th>2017 Feed Expenses/AU</th>
<th>2017 Vet Expenses Per AU</th>
<th>Expense Per AU</th>
<th>Total Expenses</th>
<th>Gross income Total</th>
<th>Gross Income per AU</th>
<th>Net Income over Variable costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Does</strong></td>
<td>$142</td>
<td>$29.40</td>
<td>$171.40</td>
<td>$914.13</td>
<td>$7928.36</td>
<td>$1486.57</td>
<td>$7,014.23</td>
</tr>
<tr>
<td><strong>Ewes</strong></td>
<td>$48</td>
<td>$29.40</td>
<td>$77.40</td>
<td>$3302.40</td>
<td>$54,629.60</td>
<td>$1781.44</td>
<td>$51,327.20</td>
</tr>
<tr>
<td><strong>Cows</strong></td>
<td>$48</td>
<td>$15.69</td>
<td>$63.69</td>
<td>$3311.88</td>
<td>$26,566.63</td>
<td>$718.27</td>
<td>$23,254.75</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$238</td>
<td>$74.49</td>
<td>$312.49</td>
<td>$7528.41</td>
<td>$89,124.59</td>
<td>$81,596.18</td>
<td></td>
</tr>
</tbody>
</table>
GRAZING PREFERENCES

- Goats - Browse
- Sheep - Forbs
- Cattle - Grass
- Deer - Browse
## PERCENTAGE GRASS, FORBS, & BROWSE IN DIETS

<table>
<thead>
<tr>
<th>Animal</th>
<th>Grass</th>
<th>Forbs</th>
<th>Browse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep</td>
<td>61</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Goats</td>
<td>45</td>
<td>12</td>
<td>43</td>
</tr>
<tr>
<td>Cattle</td>
<td>81</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>White-tailed Deer</td>
<td>12</td>
<td>36</td>
<td>52</td>
</tr>
<tr>
<td>Horses</td>
<td>90</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Elk</td>
<td>64</td>
<td>16</td>
<td>20</td>
</tr>
</tbody>
</table>
SEASONAL DIET COMPOSITION FOR CATTLE

![Bar chart showing seasonal diet composition for cattle]

- **Seasons:** Spring, Summer, Fall, Winter
- **Categories:** Grass, Forbs, Browse

- **Grass** consumption is highest in Winter and lowest in Spring.
- **Forbs** are a significant component in Spring and decrease through Summer and Fall.
- **Browse** is consistently low across all seasons.
SEASONAL DIET COMPOSITION FOR GOATS
SEASONAL DIET COMPOSITION FOR SHEEP

- Spring: Grass (50%) > Forbs (40%) > Browse (10%)
- Summer: Grass (60%) > Forbs (30%) > Browse (10%)
- Fall: Grass (70%) > Forbs (20%) > Browse (0%)
- Winter: Grass (55%) > Forbs (35%) > Browse (10%)
Foraging behavior of goats

- Browsers – prefer woody plants, shrubs, vines and leaves.
- Top-down grazer, graze evently (first grazer)
- Tend to select grass over clover
- Inclined to graze steeper, higher, drier areas.
- Like to graze fencelines
- Have a tolerance for tannins and other bitter compounds.
- Tend to have fewer problems with plant toxicities.
Foraging behavior of sheep

- Prefer forbs (weeds)
- Eat grass and browse
- Like clover
- Graze close to the ground
- Inclined to graze higher, drier areas
- Shy away from wet areas.
- Tolerant of salt.
Sheep and goats for vegetation control
What affects what an animal will consume?

- Availability of other plant species.
- Season
- Presence of other grazing animals.
- What species of plants animals were exposed to as juveniles (young learn from their mothers what to eat).
- Anti-quality factors
- Breed
Browse (Goats Prefer)
Brush, briars, shrubs, trees, leaves, bushes

- Multiflora rose
- Black locust
- Greenbriar
- Kudzu
- Sumac
- Blackberry
- Honeysuckle

Contain higher levels of crude protein and Phosphorus than grass.
Forbs (sheep prefer)  
Broad-leaf weeds  

Contain higher levels of crude protein and Phosphorus than grass.
**Legumes (sheep & cattle prefer)**

Pasture should contain 35-40 percent legumes

- **Advantages**
  - Fix nitrogen
  - High quality than grasses
  - Greater intake by animals
  - More productive during summer than cool season grasses.

- **Disadvantages**
  - Harder to maintain in pasture
  - Bloat concerns
  - Estrogen content
Warm season and native grasses

Why?
- To provide forage during summer when cool season grasses are less productive.
- To enable stockpiling

But . . .
- Are harder to establish
- Sheep have generally not performed as well as cattle on warm season grasses. Goats???
Cool Season grasses

- Form the basis of most permanent pastures in Eastern Nebraska.
- Can provide greater yields of high-quality forage than weeds and brush.
Winter Annuals
Small grain, annual ryegrass, matua prairie grass

Provide grazing during late fall, winter, and early spring.
Co Grazing Near Nelson Nebraska
Elements of Good Grazing Management

1. Stocking rate
2. Timing of grazing (season of use)
3. Distribution
4. Kind/class of livestock
Grazing management/system
A compromise between production per head and production per acre

- Rotational grazing recommended over continuous grazing
  - Increases forage production and quality of forage
  - Reduces selective grazing by livestock
  - Increases plant diversity
  - Helps to control weeds.

- Pastures should be grazed a week before the grass heads out. Legumes should be grazed in early or mid-bud stage.
  - “Take half- leave half” - don’t graze below 2 inches.
  - There is no “best” number of paddocks.
  - More paddocks will allow for longer rest periods (better parasite control).
    - 30-day rest period, 3-day grazing period = 10 paddocks.
Grazing Management
Perennial Native and Seeded Pasture
Improved Grazing Distribution → Increased Grazing Efficiency
Seasonal growth
The Pasture Dilemma

Cool season forage produced

Forage needed

700 lb steers per acre

Months during season

What do you plant?
There is no perfect forage/grass for sheep and/or goats.

- Cool season grasses
- Legumes
- Warm season grasses
- Winter annuals
- Forbs (broad leaf weeds)
- Browse
Estrogen content of pastures
Phytoestrogens

• The estrogen content of legumes can interfere with reproduction.
• Ewes and does should be kept off pastures containing high amounts of legumes 2 to 4 weeks before breeding.
Leafy Spurge Control

No sheep
Sheep
Nitrates and Prussic Acid

**Nitrate poisoning**
- Sorghums, millets, corn, oats, rye, and pigweed
- When $\text{NO}_3$ exceeds 1% in plant tissue – occurs when tissue is stressed (moisture) and high levels of nitrogen are present
- Don’t graze during stress periods
- Don’t graze too short
- Dilute with other forages, grain
- Does not leach out of hay

**Prussic Acid poisoning**
- Occurs primarily in sorghum family (johnsongrass, sorghum, sorghum-sudan)
- When HCN levels exceed 500 ppm on DM basis (200 ppm on wet basis)
- Occurs when plant tissue is stressed, primarily after frost or drought in a high N environment.
- Avoid grazing for one week after hard frost or during severe drought.
- Hay can be fed due to volatilization of CN compounds.
Poisonous plants

- Unexplained Deaths
- Relates to quantity of material consumed, portion and age of plant eaten, the season of the year, age and size of the animal, and other factors.
- Signs of plant poisoning can be varied and mimic other health problems.

http://www.sheepandgoat.com/poison.html
http://www.ansci.cornell.edu/plants/goatlist.html
Poisonous Plants

Lily-of-the-valley

Yew

Larkspur

Azaleas

Wild cherry
Grass Tetany  
hypomagnesemia, magnesium deficiency, “grass staggers”

- Can be a problem in sheep and, to a lesser extent goats grazing lush, rapidly growing forage.
- Usually occurs during the early spring on pastures that are well fertilized with nitrogen and potassium.
- A combination of elevated N and P levels in the forage leads to a reduced absorption in the GI tract of the animal.
- Goats and sheep grazing lush cereal grains (e.g. wheat, rye) particularly in early lactation or late gestation are predisposed to this condition.
Frothy Bloat

- Less common in goats than sheep and cattle

**Predisposing factors:**
- Recent turnout to legume or wet grass pastures.
- Feeding of garden greens to animals on a dry hay diet.
- Gleaning of grain fields.

**Prevention**
- Limit legumes to less than 50% of pasture mix
- Gradually introduce animals to greenchop or fresh legumes.
- Feed dry, stemmy hay for 1 to 2 hours before allowing access to legume pasture.
- Graze safer legumes
- Include poloxalene in the feed or mineral.
- Include ionophore in mineral supplement.
Fencing – What we do

• Perimeter fence
  • High tensile electrical wire
    • at least 42 (52) inches tall
      • 6 to 8 inches near ground
      • 8 to 12 inches at top strands
      • from ground: 6, 14, 22, 32, 42, (52)
      • at least 4,000 volts; train goats first
Pastures for Goats & Sheep in a Cow Calf State

10-12”

6”

4”
Predators
Accounted for 37.3% of losses in 2005

- Management
  - Start with a good fence
  - Lamb and kid where predator risk is low
  - Night penning
- Livestock Guardians
  - 45% of U.S. sheep farms employ livestock guardians.
- Lethal control
  - Hunting, trapping, and denning
  - Livestock production collars, M-44 injector
Gastro-Intestinal Parasites

Stomach Worms
- *Haemonchus contortus***
- *Ostertagia*
- *Trichostrongylus*
- *Nemotodirus*

Coccidia
- *Eimera* spp.

- Good pasture and animal management
- Selective deworming using the FAMACHA© system
- Fecal egg counts to monitor pasture contamination and measure drug resistance.
Weaning

• Lambs and kids can be weaned as early as 30 days and as late as 6 months or more.

• There are numerous advantages and disadvantages to early and late weaning.

**Early weaning (2-3 mos.)**
- Save best pasture for lambs and kids
- Can market cull ewes/does earlier
- Focus parasite control on young stock

**Late weaning (> 3-6 mos.)**
- More natural
- Less stressful to lambs/kids
- Less problems with mastitis
- Ewes/does contaminate pastures with worm eggs
- Need to castrate males
Shade

- Do sheep and goats need shelter or shade when they are grazing?
- When given a choice, sheep/goats will choose shelter during inclement weather.
- Providing shelter/shade can be one of the most challenging aspects of designing a grazing system.
Use of Coccidiostats on Pasture

- Slow down development of coccidia
- Must be fed before risk period
- Fed daily in small amounts

- Ionophores
  ***do not allow any equine to ingest***
  - Monensin (Rumensin®)
    FDA-approved for goats
  - Lasalocid (Bovatec®)
    FDA-approved for sheep
  - Decoquinate (Deccox®)
    FDA-approved for goats and sheep
Mineral supplementation

- Provide free choice minerals to grazing livestock.
  - Feed sheep mineral to sheep
  - Feed goat mineral to goats
  - Feed sheep mineral to co-mingled sheep/goats
- Consider feeding protein blocks or tubs if lambs/kids are grazing poor quality pasture.
- Consider feeding mineral containing a coccidiostat to lambs/kids, but not dry ewes/does.
Water
The most critical nutrient

- Consumption is 1 to 1.5 gal. per 4 lbs. of dry matter consumed.
- Rain, dew, or snow will influence water intake.
- Environmental temperature greatly affects water intake. Ideal temperature is 45-55°F.
  - Locate during shade in summer
  - Use heaters in winter
- Sheep/goats will not consume poor quality water.

Sheep/goats should have access to water at all times.
Creep feeding
To increase rate of gain of nursing lambs/kids

- Dry feed
  - 14-18% CP
  - Ca:P ratio of at least 2:1
  - Inclusion of ammonium chloride or ammonium sulfate to prevent UC.
- Fresh and palatable
- Minimal dust/fine particles
- Pelleted feeds prevent sorting (<¼ in. diameter)
- Vaccinate for overeating disease

- Creep grazing
  - High quality forage

Is creep feeding economical?
Supplementing lambs/kids on pasture

**Why?**
- Increase rate-of-gain of weaned lambs/kids
- Increase parasite resistance (esp. protein supplementation)
- Increase carrying capacity of pasture
- Makes animals tamer
- Allows closer monitoring of animal health
- High grain levels (>1% of BW) may interfere with fiber digestion.
- By-product feeds (soybean hulls, corn gluten feed, wheat middlings, brewers grain distillers grain, and rice bran) do not negatively impact forage digestion.

Is it economical?
Contact information
randy.saner@unl.edu
308-532-2683
Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln cooperating with the Counties and the United States Department of Agriculture.

University of Nebraska-Lincoln Extension educational programs abide with the nondiscrimination policies of the University of Nebraska-Lincoln and the United States Department of Agriculture.