Colonial Soil & Water Conservation District
Report about Horse Stocking Rate to Listening Forum for
the James City County 2045 Comprehensive Plan
Colonial District Overview

- Political Subdivision of the Commonwealth of VA
- One of 47 Districts in VA
- Serves James City, Charles City, New Kent, York Counties and the City of Williamsburg
- Historic focus VA cost share program for Ag. Best Management Practices
- James City County limited horse census found challenges.
Equine Assessment

• *Phase 1, including survey and quantification of horses present in target watershed, completed in Winter 2018*

• *Phase 1 results indicated a need for further technical and educational assistance for equine operations*

• *Phase 2 proposal updated based on these results was presented to the Stormwater Programs Advisory Committee in Fall 2019*
Recent JCC Conservation Plans for Horse Operations

• Within the past two years the District has developed conservation plans for three horse operations.

• These plans range from 42 to 125 pages reflecting basic and varying complexity of horse operations and addressed the following key issues among others:
  • Maps showing location of soil types (which can vary considerable within short distances), Resource Protection Areas (RPAs), and RPA proximity to paddocks.
  • Nutrient, especially nitrogen and phosphorus, Management Plans (NMPs) providing enough to support forage growth, without excess leaching into and polluting ground or surface water & application timings.
  • Pasture Grazing Management – to avoid overgrazing (soil erosion, impact water quality, and weed promotion), promote forage growth, and maintain a minimum grass height of 3 inches uniformly across a paddock.
  • Heavy Use Areas – for locations with high traffic and holding horses when pasture can not tolerate their presence, e.g. after heavy rain, snow, herbicide applications, etc..
  • Manure Management – removed from site, composted or applied to the land. Any use including compost on land must be tested and factored into site NMP.
  • Fencing - both fixed and temporary to contain horses and manage pastures.
  • Stream crossings - outside of RPA buffers, allowing water flow from upstream, and stabilized.
JCC code vs Expert Guidance & elsewhere in VA

• JCC Code permits 7 horses per acre in A-1 and more in R-4, R-6, R-8
  • updated September 18, 1995 establishing above ratio for permitted general agriculture in an excessive response to a Virginia “Right to farm” bill

• Expert Guidance recommends 2+ acres for the first horse and an additional acre per additional horse

• Where stocking rates are addressed elsewhere in VA unpermitted is most common; next is an acre per horse

Slides 16 & 17 with back up on above points included in package.
Horse Stocking Rates in Virginia

Jurisdictions reporting permitted horses per acre

Jurisdictions

permitted horses per acre

0 0.333333333 0.5 0.67 1 2 3 4 7 16

Residential Agricultural

See CSWCD summary file 2019 DCR Horse Stocking Rate study for additional details & Reference #1
Over Stocking Environmental Impacts

• soil erosion
• nutrients entering streams
• sediment in streams
• bacterial contamination of streams
• flies
Pasture Grazing Best Management Practices

- Provide 2-3 acres per horse. If land area is limited, grazing must be controlled to maintain healthy pastures.
- Establish four or more pastures and graze them rotationally.
- Horses avoid areas of dung piles and can graze very closely.
- Horses tend to graze some areas closer than others, so rotate horses to a fresh pasture when heavily grazed areas are at 2-4". Clip ungrazed areas of the pasture.
- Drag pastures to distribute dung piles and encourage uniform grazing.
- Rest pastures to allow plants to replenish food reserves. Allow pastures to regrow to a height of 8-10".

Do not graze pastures when plants are not growing. Feed hay in a heavy use area to avoid overgrazing pastures during the winter and summer.

Remove horses from pastures during wet weather. Hoof action can seriously damage established sods when frozen or during wet periods of the year. Place horses in the heavy use area and feed hay when the soil is soft.
Continued Pasture Best Management Practices

- Pasture preparation is more than just seeding an area. Factors to be addressed include weed control prior to seeding and during establishment of sod, PH and fertilization, preparation of seed bed, seed selection, planting timing, good soil seed contact, seeding rate and depth.
- Proper pasture design allows horse owners to control grazing.
- **Individual pastures should be square.** Long and narrow or odd shaped pastures are not uniformly grazed.
- **Pastures should be uniform.** Pastures should contain similar forage species, soil types, slopes, and aspects.
- **Horses should have access to fresh water and shade.** Ideally, each pasture should contain water and shade.
- Newly established forage stands do not develop into a fully mature sod until the second growing season after establishment. New stands should be grazed only after plants are well anchored. *Light and infrequent grazing can encourage the development of a healthy sod but avoid overgrazing.*
- Sound pasture management is critical for maintaining a healthy and vigorous sod that benefits the horse, owner, and environment.
- **Soil test pastures.** Pastures should be soil tested every 2-3 years in order to provide a baseline for tracking changes in pH and fertility.
- **Maintain adequate soil pH.** Soil pH can dramatically affect nutrient availability and plant growth. Maintain pH between 6.2 and 6.5 for grass-legume pastures by applying lime according to the soil test.
Areas Unsuitable for Pasture

• Septic drain fields
• Resource Protection Areas
• Forest
• nontidal wetlands not in RPAs
• floodplains
• highly erodible soils, especially with steeper slopes
• highly permeable soils
• hydric (permanently saturated) soils
Manure Management Best Practices

- Internal parasites, insects, rodents, and odors are possible manure related health concerns on horse farms.

- The average 1,000-pound horse produces approximately 50 pounds of manure daily. Bedding & other stall waste bring this to between 60 and 70 pounds.

- Many horse owners lack enough land or vegetative cover to properly apply large amounts of manure and nutrients. Improper manure storage and land application can contaminate streams with excess nutrients via surface runoff or as leachate.

- Best Practices:
  - Manure storage designed to limit the chance of leachate entering surface- and groundwater resources. Ideally, storage piles should be placed on gravel, hardened clay, or concrete pads that slope inward. Appropriately separated from sensitive areas.
  - Removal to offsite facility for composting or other appropriate disposal.
  - Composting on site - Composting horse manure involves more than piling the waste. Few farms truly compost. Composting is managed decomposition considering the following factors: carbon to nitrogen ratio, oxygen, moisture, and temperature. Composting is an aerobic (requires oxygen) process. There are several ways to provide oxygen to a compost pile. The most common way is to turn the pile. Turning large piles is generally done using the bucket of a tractor or front-end loader. Monitor the compost pile with a compost thermometer. The goal is to sustain temperatures of 130º to 150ºF in the pile interior to optimize decomposition and kill pathogens and weed seeds.
Horses are confined in heavy use areas to keep them from compacting, overgrazing, and trampling wet/frozen/dormant pastures. Hooves compact the soil, suffocating plant roots and reducing the soil’s capacity for holding water. Livestock can also remove all vegetation, leaving exposed bare ground that can erode into nearby waterways.

Facilitates rotational grazing; especially with limited pasture. Horses should not be allowed back onto the pasture until the grass is 6-8 inches tall. These provide space for horses until pastures are again ready for grazing.

Eases manure management; cleaning muddy, manure-filled paddocks is very difficult, if not impossible during wet months. Heavy use areas allow for easy, year-round cleaning.

A grassy area around the heavy use area catches excess nutrients (from livestock manure) and sediments and soaks up excess water running off the area.
**Recommendation**

Permitted horse uses in A-1, R-4, R-6, or R-8 should have at least an acre of acceptable pasture for each horse. Alternatively, horse uses could submit for approval a set of mitigations, to offset the environmental impact of additional horses.

All horse uses should have:
1. pasture and manure management plans and
2. install heavy use area(s) as necessary to avoid soil erosion and water pollution.

Furthermore, plans for horse uses should be subject to approval and operations should be periodically inspected for compliance with mitigations, plans, and required installations.

See details about codes on slide 16 and pointed to by note f) on slide 20. A-1=General Agriculture, R-n=Residential variations
Additional Recommendations

Permitted horse uses in Residential Areas, e.g. R-4, R-6, or R-8 should set an explicit ratio requirement no greater than in A-1 between number of horses & acceptable pasture acreage.

Stocking rates for other permitted livestock in A-1 should be to adjusted to reflect industry standard rates such as listed below on an animal unit equivalent basis, i.e. 1-acre per. animal unit.

<table>
<thead>
<tr>
<th>Domestic Animal</th>
<th>AUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow – dry</td>
<td>1</td>
</tr>
<tr>
<td>Cow with calf</td>
<td>1</td>
</tr>
<tr>
<td>Bull – mature</td>
<td>1.25</td>
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<tr>
<td>Steer/Heifer - 2 Years</td>
<td>0.8</td>
</tr>
<tr>
<td>Calf – weaned</td>
<td>0.6</td>
</tr>
<tr>
<td>Sheep – mature ewe or ram</td>
<td>0.2</td>
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<tr>
<td>Sheep – yearling</td>
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<tr>
<td>Goat</td>
<td>0.17</td>
</tr>
</tbody>
</table>
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JCC Code

- A-1 (general agriculture) permits horses up to 7 per acre.
- R-4 (residential planned community) permits horse and pony farms also riding stables unconstrained on the number of horses.
- R-6 (low density residential) permits horse or pony farms (including the raising and keeping of horses) also riding stables unconstrained on the number of horses, minimum lot size 43,560 sq. ft (i.e. an acre).
- R-8 (rural residential) permits horse and pony farms of less than 50 animals (including the raising and keeping of horses) also riding stables, minimum lot size 3 acres.
  - i.e. up to 16.7 horses per farm lot acre
  - riding stables are unconstrained on the number of horses.
  - 50 or more animals on a farm requires a special use permit.
- While Zoning Administrators might apply the A-1 ratio to keeping horses in above residential districts; such Zoning Administrator decisions are subject to challenge and appeal.
VA § 3.2-301. Right to farm; restrictive ordinances.

• In order to limit the circumstances under which agricultural operations may be deemed to be a nuisance, especially when nonagricultural land uses are initiated near existing agricultural operations, no locality shall adopt any ordinance that requires that a special exception or special use permit be obtained for any production agriculture or silviculture activity in an area that is zoned as an agricultural district or classification. Localities may adopt setback requirements, minimum area requirements, and other requirements that apply to land on which agriculture and silviculture activity is occurring within the locality that is zoned as an agricultural district or classification. No locality shall enact zoning ordinances that would unreasonably restrict or regulate farm structures or farming and forestry practices in an agricultural district or classification unless such restrictions bear a relationship to the health, safety, and general welfare of its citizens. This section shall become effective on April 1, 1995, and from and after that date all land zoned to an agricultural district or classification shall be in conformity with this section.

Reference Material


Bibliography

a) REDUCING THE ENVIRONMENTAL IMPACT OF HORSE KEEPING By Amanda R. Shere Advised by Professor William Preston GEOG 461, 462 Senior Project Social Sciences Department College of Liberal Arts CALIFORNIA POLYTECHNIC STATE UNIVERSITY Spring 2012 Retrieved from https://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1093&context=socssp on 2-1-2020


Support and Backup Files

a) CSWCD Supporting Material - Heavy-Use-Areas – Describes purpose, benefits, and construction of such areas. An information source for slide about associated Best Management Practices.


e) CSWCD Supporting Material - 2019 DCR Horse Stocking Rate study - information source cited in slide about stocking rates in Virginia.

f) CSWCD Supporting Material - JCC Code excerpts as of 2020-02-28 - information source cited in slides about JCC code.