

Pasture Evaluation: Equine Pasture Evaluation Disc

The Penn State Equine Pasture Evaluation Disc (EPED) can be used to document the concentration of weeds and desirable plants in pastures.



Figure 1. Disc and Contractor's Flag Pin.

In order to be sure that your pastures are healthy and productive, it is important to frequently survey your pastures and evaluate the composition and density of the plants that are present. Practices such as mowing, fertilizing, rotating, overseeding and managing weeds can improve the forage value of pastures. Evaluating pastures before and after implementing pasture improvement practices is the best way to measure the effectiveness of the practice.

The Penn State Equine Pasture Evaluation Disc (EPED) can be used to document the concentration of weeds and desirable plants in pastures. This method provides quantitative information that can be used to provide a valid assessment of pasture quality.

Materials

- Penn State Equine Pasture Evaluation Disc (EPED) table
- Contractor's flag pin or stick

- Chart and pencil, to record the data
- Weed and Forage Identification References

Directions

1. Mentally divide the pasture so that you could draw a "W" using the entire length of the pasture.
2. Standing at the first point along the "W", throw the EPED in front of you. It does not matter if the disc does not land flat or lodges on top of pasture plants. If the disc lands upside down, toss it again.
3. Place the contractor's flag pin vertical to the ground so that it aligns with the arrow on the disc (Figure 1). If a plant leaf, stem, or seed head touches the pin, record the type of plant on the chart provided. If more than one plant touches the flag pin, record only the top plant. If no plant touches the pin, record the pasture condition at the base of the pin as plant litter, bare ground, organic matter or other.
4. Pick up the EPED and walk several feet and toss it again, covering the whole pasture in the "W" pattern. The more data that you collect, the more accurate the data will be. Generally, you should collect 10 data entries by throwing the EPED 10 times for a pasture that is one acre or less. Data from 20 tosses should be recorded for pastures that are larger than 1 acre.
5. Record your data on the Pasture Evaluation Table in the appropriate columns

Table Columns

Column #1 —Forage Grasses: If a high quality grass, such as orchardgrass, timothy, tall fescue, brome, festulolium, Kentucky bluegrass, or perennial ryegrass touches the flag pin, check the box in column #1. If you enjoy identifying plants, feel free to fill in the name of the grass. If the grass is a low quality grass (foxtail or crabgrass) also check this box. Don't worry if you cannot identify the grasses. If you do not know what type of grass it is, just record the grass as unknown.

Column #2 —Forage Legumes: If the flag pin intercepts a desirable legume (alfalfa, white clover, or red clover), check the box in column #2 for your first toss.

Column #3 —Weeds: Weeds are plants that are rarely used by horses as a source of nutrition. Weeds may include plantain,



pigweed, ragweed, Canada thistle, knotweed and many others. Some weeds like buttercup and nightshade are toxic. If the flag pin intercepts any part of a weed, check the box in column #3. If you enjoy identifying plants – feel free to fill in the name of the weed.

Column #4 —Plant litter: If the flag pin does not intercept a plant but touches soil that is covered with pieces of decaying plant fragments (herbaceous plant litter), check the box in column #4.

Column #5 —Bare Ground: If the base of the pin touches bare ground with nothing covering the soil, check the box in column #5.

Column #6 —Organic Matter: If the base of the pin intercepts organic matter such as manure, moss or lichens, check the box in column #6.

Column #7 —Other: If the base of the pin intercepts anything else such as bedrock or standing water, check the box in column #7.

Results

1. Add up the data in each column on your chart. Place the total in the space provided.

2. Next calculate the % of the pasture that is covered by each factor that you documented. If you used 10 tosses in the pasture, divide the column total by 10 and multiply by 100 to obtain the % of the pasture that is composed of the item in the column. For example if you have 7 checks in the column that measures grass forages, then 70% of the pasture is composed of grass forage ($7 \div 10 \times 100$). If you have 2 checks in the column indicating bare soil, then 20% of the pasture is composed of bare ground ($2 \div 10 \times 100$). If you complete 20 frisbee tosses then divide by 20. For example if you have 12 checks in the column for weeds, then 60 % of the pasture composition is weeds ($12 \div 20 \times 100$).

3. **Desirable plants canopy:** to calculate the % of the pasture that is covered by the canopy of plants that have forage value, add the % that is covered by grasses (column 1) and legumes (column 2) together. Place the number here: _____ %

4. **Total plan canopy:** to calculate the % of the pasture that is covered by the canopy of all plants, add the % of the pastures that is covered by grasses (column 1), legumes (column 2) and weeds (column 3) together. Place that number here: _____ %

Total Plant Canopy

Research has shown that it is important to maintain at least 70% to 75% canopy cover in pastures. Below that, significant sediment and nutrient loss can occur through erosion. Nutrients and sediments can have a negative effect on ground and surface water quality. A pasture canopy cover that is above 70% is considered good and will adequately prevent extensive soil erosion. A canopy cover of 80 to 90 % is very good, and 90% is excellent!

In a recent Penn State study of 20 equine operations within the Chesapeake Bay drainage basin, 11 of the farms had a plant canopy cover of over 90%. Seven farms had a canopy cover between 80 and 90%. One farm had a canopy cover of 75% and only one farm was below 70%.

How would you rank the canopy cover in your pastures?

Desirable Plant Canopy

Although a high canopy cover is very important in preventing erosion and sediment loss, canopy cover does not always correlate with high quality pastures. If 80% of a pasture is covered with plants, but only 40 % of that pasture is composed of grasses and legumes, the other half is composed of weeds. In excellent, well-managed pastures, at least 80% of the canopy of a pasture should be composed of grasses and legumes with forage value. If 70 - 80% of the pasture canopy is composed of grasses and legumes with forage value, the pasture quality is considered to be adequate. If the concentration of desirable plants falls below 70%, then considerations should be given to adopting management practices to improve pasture quality.

In the study previously cited, two of the twenty farm had pastures that contained a dense population of desirable plants. Over 80% of the plants in the pastures supplied nutrition for the horses. Six of the farms had pastures that had a low to medium density of desirable plants with only 60-75% of the plants supplying nutrition. Eight of the twenty farms had pastures with a low density of desirable plants with only 50-60% of the plants having forage value. Four of the twenty farms had a very low density of desirable plants with less than 50% of the plants supplying nutrition for the horses.

How would you rate the density of desirable plants in your pasture?

List of Suggested References

- Weeds of the North East, Comstock Publishing Associates,
- Cornell University Press
- Identifying Pasture Grasses, Wisconsin Cooperative Extension
- Identifying Pasture Legumes, Wisconsin Cooperative Extension
- Penn State Agronomy Guide

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Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

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Code: ART-4523