BIOLOGY TECHNICAL NOTE
AL-117

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Evaluating Stands of Herbaceous Vegetation

Employees are often asked for recommendations regarding stands of vegetation. This may happen after a drought or some other type of disaster, a new planting or after years of use. The following guidance should provide adequate options to effectively assess the adequacy of a stand of vegetation. The evaluations usually measure stand density, plant diversity, or plant canopy.

Transects

Most evaluation methods involve collecting plant data along a suitable number of transects across the stands in question. Use the below table to determine the number of transects needed.

Ac.	0 < 5	≥ 5 < 10	≥ 10
MINIMUM Transects Needed	2	3	*No. of Transects = Ac. x .003 x 100

*Ex. 50 ac. = 50 x .003 x 100 = 15 transects needed.

The transects should be randomly located across the fields in question. Transects may follow lines established by pacing or by placing a measuring tape or cam line. At preselected locations appropriate data measurements will be made. If multiple fields are being evaluated and they are very similar in soil type, management, landscape location, primary forage species, etc. then one representative field may be used to make the plant assessment.

Plant Count/Density per square foot

To collect this type of data, a frame, one-square-foot in size, is a good tool to use. This frame can easily be constructed from 1/2 inch PVC pipe. A circular one-square-foot frame can be constructed using 42.5 inches of 3/16 inch plastic covered cable. The ends can be joined with a short section (1 inch) of 1/4 inch outside diameter copper tubing to complete the ring.

For accurate measurement, a pre-determined number of steps should be taken, at a diagonal or perpendicular to the direction of machinery travel, and the frame dropped at the end of your foot on the final step. Count those plants that are rooted within the frame. Plants of interest for data collection may include the desirable forages, weeds, or specific plant species. At least 10 data points will be collected along each transect. For instance, along a 300 foot tape take 10 measurements at 10, 40, 70, 100, 130, 160, 180, 210, 240 and 270 foot marks. If pacing, take measurements every 10 steps.

Avoid sampling in end rows or turn around areas that may have been double seeded. Do not be biased in sampling, but sample in a systematic manner. When pacing, it is best to select a landmark on the horizon to walk towards in a straight line. The sampling pattern should be such that a "representative" plant evaluation is obtained. This method may also be used to determine if a planting is successful.

The following table should be used to interpret the plant count data for desirable plant species and to make recommendations.

Plant Stand Recommendations Based on Plant Assessments			
Commonly Planted Forages	**Plant Population per Sq. Ft.**		
	Scale 1*	**Scale 2****	**Scale 3*****
Bahiagrass	0 - 3	4 - 8	9+
Common Bermudagrass	0 - 9	10 - 21	22+
Dallisgrass	0 - 3	4 - 18	19+
Tall Fescue	0 - 4	5 - 10	11+
Orchardgrass	0 - 8	9 - 20	21+
Alfalfa	0 - 5	6 - 13	14
Guidance:	*** Scale 1:** Replant sampled area. ****Scale 2:** management should be used to facilitate stand restoration. *****Scale 3:** Satisfactory stand.		

When mixed stands of grasses are being evaluated, consider the purpose of the mixture. For instance a mixture of bermudagrass (9 plants/ft^2) and bahiagrass (3 plants/ft^2), alone, each may be considered a failure; but, together only improvements in management may be needed. In this instance, these forages are in the same warm season functional group, provide similar grazing benefits to livestock and have similar production. A mixture of tall fescue and orchardgrass could be considered similarly.

However, if the site had been planted and only 9 bermudagrass plants/sq. ft. were present then the site may need replanting.

For evaluation of plantings, consider the plant species. For instance, plantings of bahiagrass or dallisgrass may take more than one year for a suitable number of plants to have established due to their hard seeded nature.

Stand Cover

This method evaluates the per cent ground cover provided by the plants. Again, data is collected along transects established by tapes or pacing. At each point of measurement record percent presence of each plant. Average the results for all data collected and use the following table to determine if the stands need replanting, management is needed to improve the stand or if the current stand is satisfactory. **Use this method of to evaluate per cent cover when visual observations are not very clear.**

Primary Grass(es)* **	**Visual Est. of % cover**	**Action Needed**
Bahiagrass	< 40%	Replanting Needed
Common Bermudagrass	40% < 75%	Management Needed
Dallisgrass	≥ 75%	Maintain Stand
Tall Fescue Orchardgrass Alfalfa		
****** Density values represent the approximate % Cover**		

When mixed stands of grasses are being evaluated, consider the purpose of the mixture. For instance a mixture of bermudagrass and bahiagrass each may only cover about 35% of the soil, but together they cover 70% of the soil. In this instance, these forages are in the same warm season grass functional group, provide similar grazing benefits to livestock and have similar production. Only management of the forages is needed to improve the stand of grasses.

Plant Diversity/Composition

Understanding existing plant diversity or composition of a grass stand is important in some of the NRCS program work. For instance, the Grassland Reserve Program provides ranking considerations for grass stands based on the plant diversity.

To quickly assess plant diversity or density, use a line transect or pace method collect data. Data should be collected for the specific plant at a specific location on the tape or position on a shoe/boot. To do this, identify the plant located at the 3, 6, 9, etc. foot marks on the tape measure for a total of 50 points along a 150 foot line. Or, when pacing, identify the plants at a specific position on a shoe at the specified intervals along the transect. Follow the earlier guidance for the number of transects needed for a field evaluation. Summarize data to reflect the plant diversity or composition.

Additional Documentation

Take representative photographs of the fields as another source of documentation.

Worksheet

A sample worksheet is included for use in evaluating herbaceous stands. The information obtained from sampling plant density can be used as a reference when making management decisions. For example, a new seeding with a low plant count will require more intensive management, in order to be successful, than a new seeding with a high plant count. If “spot” seeding is necessary to fill in weak areas of a stand, then prepare a sketch showing how the field was sampled. It will help define the areas in need of reseeding. As the field is sampled, there is an opportunity to identify weed infestations for future control efforts. This may also help to promote stand survival. The stand evaluation should be used as a management tool, as well as a means of documenting condition or quality of the existing stand.

HERBACEOUS STAND EVALUATION

Client:_____Evaluated by:_____

Farm/Tract:_____Fields:_____Acres:_____Date:_____

Practice:_____

SPECIES/VARIETY MEASUREMENT						
Data Point						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
Total						
Ave.						

DATA SUMMARY OPTIONS:

DENSITY OF SPECIES of INTEREST:

PLANT VIGOR:

WEED COMPETITION:

OTHER COMMENTS:

RECOMMENDATIONS TO COOPERATOR:

MAP SHOWING FIELD LAYOUT AND SAMPLING PROCEDURE