



United States
Department of
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Soil
Conservation
Service

Huron,
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TECHNICAL NOTE

RANGE TECHNICAL NOTE NO. 1

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GUIDELINES FOR HERBACEOUS STAND EVALUATION

What is an "adequate stand?" There are two major considerations 1) adequate protection of the soil resource and 2) a stand adequate for the planned purpose.

Protection of the soil resource is contingent primarily on the "V" Factor for wind erosion and the "C" Factor for water erosion. Generally, the "V" Factor will be adequate for wind erosion control unless the soil is so sterile little to no plant growth occurs. The difference in water erosion potential is mainly dependent on changes in the "C" factor. The proper "C" factor for any condition can be obtained from the appropriate tables.

The second consideration is whether the stand is adequate for the planned purposes. Early establishment of a productive stand is more urgent for a production planting than for an idle land planting. Historically, we have judged an adequate stand by subjective means (ocular reconnaissance.) A more objective means of determining grass and legume stand emergence and establishment is often desirable for documentation and reference purposes.

Determining stand density can be done in an accurate manner and in a short period of time by using a frame or row count technique. Correct plant identification is necessary to ensure accuracy. Knowledge of the vegetative characteristics of the species to be sampled is essential. If the field is sampled soon after emergence, often a plant can be uprooted with the seed attached for reference.

Two sampling techniques may be used. They are the frame count and row count methods. A one-square-foot frame is easily constructed. When a frame count is used, all the plants rooted within the frame should be counted. If the row count method is used, two side by side rows should be counted, the length to be determined by the row spacing of the seeding: a 6-inch row spacing would require the observer to count all plants in the 2 rows for a length of 12 inches; a 7-inch row spacing would require a 10.3-inch length of 2 rows, and an 8-inch row spacing would require a 9-inch length. Both the frame and row count method will sample one square foot of area. Use the frame count method for broadcast seedings or seedings in which the drill rows are not identifiable, and the row count method where seeded rows are identifiable.

A predetermined number of steps should be taken diagonal or perpendicular to the drill rows and the frame placed at the end of your foot on the final step. The same procedure would be used when making a row count. Instead of placing the
DIST: 0

frame at the toe of your foot, this point would then mark the area to begin the row count. Count only those plants that are rooted within the frame or falling in the rows and only those species which are part of the planned seeding unless information is desired on weedy species.

The number of samples required depends on factors such as stand uniformity and the number of species to be counted. Generally, a minimum of 10 counts (or frames) per 10 acres or less of field size would result in a representative sample. An effort must be made to avoid double seeded areas such as end rows or turn around areas. The observer must not be biased by heavy or thin stands but needs to sample equally in a systematic manner. It works well to select a landmark on the horizon to walk towards in a straight line. The sample pattern should be such that a "representative" plant density is obtained. This is not a time consuming procedure and 10 counts can be made in a matter of 15 to 30 minutes, depending on the number of species to be counted. If the stand is spotty and includes skip areas, then more samples than the minimum may be required. Tabular entries should be made after each frame or row count to ensure accuracy. Initial stand counts should be made before excessive plant growth makes frame alignment and the counting procedure more difficult. Ten counts per 10 acres of field should be used only as a starting point. For example, 70-80 acres of seeding with a uniform stand may be sampled accurately using 30-40 counts. Enough counts must be made so a representative sample is obtained. If a field has had several different cropping histories, the sampling should be stratified and the average plant densities kept separate for these two areas. The same would hold true for significantly different soils or topography. In these types of situations, it is likely that more than the minimum number of sample units would be required to accurately determine plant density. When counting sod forming species, each stem of a rhizomatous species more than two inches away from another may be counted as a separate plant. Using this method, depending on the rooting habit, the number of planned perennial plants per square foot would be rated as:

| <u>Sod Forming</u> | <u>Bunch Type</u> | <u>Rating</u> |
|--------------------|-------------------|----------------|
| 2.0 | 4.0 | Adequate |
| 1.0-2.0 | 2.0-4.0 | Questionable |
| 1.0 | 2.0 | Not Acceptable |

For idle land planting (CRP, etc.) use ½ of these amounts, for critical area plantings, double the amounts. Generally, periods of establishment are three full growing seasons for native plantings and two full growing seasons for tame seedings. In most cases, if at the end of this period the stand is not rated adequate, it will be considered a failure.

A sample form is included for your information. The information obtained from sampling plant density can be used as a reference point when making management decisions. A new seeding with a plant count of less than 4 may be managed differently than a new seeding with a plant count of greater than 10. If a "spot" seeding is deemed necessary because of a nonuniform stand, the sketch diagram indicating how the field was sampled, should indicate the areas in need of reseeding. As the field is being sampled, the technician has the opportunity to spot weed infestations which can be controlled before they become a major problem. The Stand Evaluation worksheet should be used as a management tool as well as a means of documenting stand establishment.

If stands are obviously adequate by visual evaluation, it will not be necessary to conduct a stand evaluation using the method. However, if the stand is questionable by visual evaluation and/or documentation is required, this method should then be used to substantiate the actual condition.

A handwritten signature in cursive script, appearing to read "Sheridan I. Dronen". The signature is written in dark ink and is positioned above the printed name.

SHERIDAN I. DRONEN
State Resource Conservationist

| SPECIES | ORIGIN | | LIFE SPAN | | | ROOT HABIT. | | SEASON OF GROWTH | | SEEDS PER LB. | SEEDS/SQ. FT. 1 LB./AC. |
|---------------------------|--------|---|-----------|---|---|-------------|---|------------------|---|---------------|-------------------------|
| | N | I | A | B | P | S | B | W | C | | |
| Big Bluestem | X | | | | X | X | | X | | 165,000 | 3.8 |
| Indiangrass | X | | | | X | X | | X | | 175,000 | 4.0 |
| Switchgrass | X | | | | X | X | | X | | 389,000 | 8.9 |
| Sideoats Grama | X | | | | X | X | | X | | 191,000 | 4.4 |
| Blue Grama | X | | | | X | X | | X | | 825,000 | 18.9 |
| Green Needlegrass | X | | | | X | | X | | X | 181,000 | 4.2 |
| Western Wheatgrass | X | | | | X | X | | | X | 110,000 | 2.5 |
| Tall Wheatgrass | | X | | | X | | X | | X | 79,000 | 1.8 |
| Intermediate | | | | | | | | | | | |
| Wheatgrass | | X | | | X | X | | | X | 88,000 | 2.0 |
| Reed Canarygrass | X | | | | X | X | | | X | 540,000 | 12.4 |
| Garrison Creeping Foxtail | X | | | | X | X | | | X | 750,000 | 17.2 |
| Smooth Bromegrass | | X | | | X | X | | | X | 136,000 | 3.1 |
| Crested Wheatgrass | | X | | | X | | X | | X | 175,000 | 4.0 |
| Orchardgrass | | X | | | X | | X | | X | 654,000 | 15.0 |
| Russian Wildrye | | X | | | X | | X | | X | 175,000 | 4.0 |
| Pubescent | | | | | | | | | | | |
| Wheatgrass | | X | | | X | X | | | X | 100,000 | 2.3 |
| Thickspike | | | | | | | | | | | |
| Wheatgrass | X | | | | X | X | | | X | 154,000 | 3.5 |
| Sand Bluestem | X | | | | X | X | | X | | 113,000 | 2.6 |
| Timothy | | X | | | X | | X | | X | 1,230,000 | 28.2 |
| Little Bluestem | X | | | | X | | X | X | | 260,000 | 6.0 |
| Prairie Sandreed | X | | | | X | X | | X | | 274,000 | 6.3 |
| Alkali Sacaton | X | | | | X | | X | X | | 1,758,000 | 40.4 |
| Alfalfa | | X | | | X | | X | | X | 200,000 | 4.6 |
| Sweet Clover | | X | | X | | | X | | X | 260,000 | 6.0 |

| <u>Origin</u> | <u>Life Span</u> | <u>Root Habit</u> | <u>Season of Growth</u> |
|----------------|------------------|-------------------|-------------------------|
| N - Native | A - Annual | S - Sod Forming | W - Warm |
| I - Introduced | B - Biennial | B - Bunchgrass | C - Cool |

STAND EVALUATION

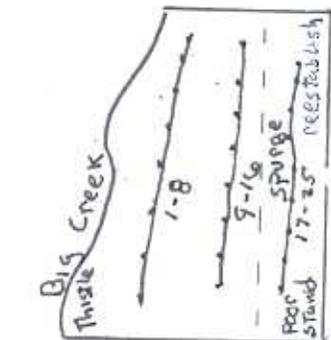
Technician Joe Meyer
Date 6/23/89

(Plants/Sq. Ft.)

Cooperator Harry Grams
Program CRP

| Species and/or Variety | Counts | | | | | | | | | | | | | | | | | | | | | | | | | Total | Avg |
|----------------------------|--------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | |
| Big Bluestem | 1 | 1 | 0 | 0 | 2 | 1 | 7 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | |
| Indian Grass | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 4 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | |
| Switch Grass | 4 | 1 | 1 | 0 | 1 | 6 | 0 | 3 | 1 | 1 | 2 | 0 | 2 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | |
| Total For Seeded species | 5 | 2 | 2 | 0 | 5 | 7 | 8 | 3 | 4 | 6 | 7 | 0 | 3 | 1 | 5 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 | |
| <u>Severe Leafy Spurge</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTALS PER COUNT | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Indicate how field was sampled:



Seeding direction N+S
Total acres 30

Total Number of Counts 25
Average Density (plants/sq.ft.) 2.5
Plots 1-16 = 4.1 Plots 17-25 = 1.2
Plant Vigor Good. Plots 1-16 Poor 17-25
Weed Competition Pigeon grass dominant
Weed but NOT A severe problem. Same Canada
Thistle NW corner. Plots 17-25 dominated
by Leafy Spurge.
Comments Area representing Plots 1-16 good
stand good vigor. Plots 17-25 poor stand
Bad weed problem
Recommendations to Cooperator Destroy
South end of seeding. (see ASX map for
Approximate Location) control spurge than
reestablish seeding. spray Canada
Thistle

Guidelines

- Sample in a systematic and uniform manner
 - Minimum of 10 counts for each 10 acres or less of field size
 - Avoid areas that may have been double seeded
 - Sample perpendicular or diagonal to drill rows
 - For broadcast or seedings where rows can not be found use a 1 square foot frame (12 in. x 12 in.)
 - For drilled seedings, where rows are easily visible, use the row count method
- | row spacing | no. of rows | length |
|-------------|-------------|----------|
| 6 inches | 2 rows | 12.0 in. |
| 7 inches | 2 rows | 10.3 in. |
| 8 inches | 2 rows | 9.0 in. |
- 1 - See SD Range Technical Note No. 1 - Guidelines for Herbaceous Stand Evaluation for Plant Density and Sampling Guidelines