United States Department of Agriculture
NRCS Natural Resources Conservation Service

GUIDELINES FOR HERBACEOUS STAND EVALUATION

Indiana - October 2013 (ver. 1.0)

AGRONOMY TECHNICAL NOTE

The success of herbaceous (grasses, legumes & cover crops) plantings depends on two factors:

1. Are the emerged plants established to the point of survivability?
2. Is the stand adequate (density and growth) for the planned purpose?

Factors affecting establishment:
How rapidly a seeding develops, and the density of the stand, is dependent on several factors: seeding date, weather (temperature and moisture) after seeding, seedbed conditions, fertility, amount of mulch or previous crop residues, planting depth, seed soil contact, seeding rate, seed quality (germination and % purity), time of freeze after seeding, insects and diseases.

Pure stands of perennial grasses and legumes naturally reach a climax density when mature. The final density depends on the management applied to the stand. Stands of most grasses that are mowed 3 to 5 times a year will generally have a higher plant density than a stand that is never mowed or mowed only once a year. Legume stands mowed 2 or 3 times per year are likely to have a higher plant density than when mowed less or more frequently than 2 or 3 times.

Time effects on establishment:
Typically, even with good quality seed, only 50% of smaller seeds (most perennials) planted may germinate. Then, the density will continue to decrease through "survival of the fittest" from competition for space, moisture, sunlight, etc. with the planted species as well as weeds. For example, expect a much higher density of plants 4 to 6 months after seeding than one year after seeding. Likewise, expect fewer plants two years after seeding until the plant population reaches its climax density (usually 2 years for most grass-legume stands).

Determining stand adequacy:
If the stand is questionable by visual observation or additional documentation is required, the following procedures will be used to document the seeding as meeting NRCS standards.

IF STANDS ARE OBVIOUSLY ADEQUATE OR INADEQUATE TO ADDRESS THE IDENTIFIED RESOURCE CONCERN/INTENDED PURPOSE BY VISUAL OBSERVATION, A FORMAL STAND EVALUATION IS NOT NECESSARY.

Correct plant identification and knowledge of the vegetative characteristics of the planned species is necessary to ensure accuracy http://plants.usda.gov/.

Only those <u>planned</u> plants that are well rooted and properly identified will be counted and used in determining the stand density.

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If the stand density is less than the values within the time frames listed in Table 1, the stand is considered inadequate. Inadequate stands may need more time and should be re-evaluated at a later time, and/or management techniques recommended to the producer to ensure the plants become adequately established. If a stand is still inadequate after a reasonable amount of time, then reseeding should be recommended.

If the stand is a mixture of species, all values in Table 1 should be reduced by the ratio of each species planned percentage in the mixture.

Sampling Method: A square frame is easily constructed with a variety of materials and shapes and can easily be converted to number of plants/ft^2. A circular frame will present the least error from edge to area ratio (1 ft^2= 42.5 inch circumference;13.5 inch diameter / 6.8 inch radius or use πr^2 to convert to ft^2).

Sample fields in a systematic manner beginning with sparse portions of stands. If these areas are adequate then the entire area is considered adequate. Conduct as many counts as needed to give a good representation of the planting. Be sure to check important area such as outlets of waterways or erosive areas. Avoid end rows or turn around areas that may have been double seeded.

If a portion of the field has had a different cropping history, fertilization program or major differences in soil types or slopes, the sampling should be stratified and the average plant densities kept separate for the different areas. Tabular entries should be made after each frame count to ensure accuracy. Initial stand counts should be made before excessive plant growth makes frame alignment and the counting procedure more difficult.

TABLE 1 - PLANTS NEEDED PER SQUARE FOOT AT VARIOUS TIME INTERVALS AFTER PLANTING FOR HERBACEOUS STAND EVALUATION***

	Critical Areas/WW's			Forage Production			Conservation Cover*		
SPECIES	**6-9 wks**	**12-52 wks**	**2 yrs****	**6-9 wks**	**12-52 wks**	**2 yrs****	**6-9 wks**	**12-52 wks**	**2 yrs****
Perennial Warm Season Grasses									
Big bluestem	NA	NA	NA	3	3	1	2	2	1
Indiangrass	NA	NA	NA	3	3	1	2	2	1
Little bluestem/ Sideoats grama	NA	NA	NA	6	6	1	3	3	1
Switchgrass	9.0	9	7	3	3	1	2	2	1
Cover Crops									
Annual Ryegrass	20	12	NA	20	10	NA	10	5	NA
Austrian winter pea	NA	NA	NA	7	3	NA	3	2	NA
Crimson Clover	NA	NA	NA	24	12	NA	12	6	NA
Hairy vetch	NA	NA	NA	7	3	NA	3	2	NA
Wheat/cereal rye/Oats	28	14	NA	24	12	NA	6	3	NA
Turnip/radish	NA	NA	NA	24	12	NA	6	3	NA
Perennial Cool-Season Grasses									
Kentucky bluegrass	36	18	13	45	22	2	22	11	3
Orchardgrass	28	14	10	24	12	2	12	6	2
Perennial Rye	20	12	6	20	10	2	10	5	1
Redtop	36	18	13	30	15	2	15	7	2
Tall fescue	20	12	6	20	10	2	10	5	1
Timothy	28	14	10	24	12	2	12	6	2
Legumes									
Alfalfa	NA	NA	NA	24	12	3	12	6	3
Alsike/Red clover	28	14	10	24	12	3	12	6	3
Annual lespedeza	30	15	11	22	11	3	11	5	3
Birdsfoot trefoil	27	13	10	22	11	3	11	5	3
Ladino clover	27	13	10	22	11	3	11	5	3

* Includes Cover Crops. Where wildlife is the primary purpose of the planting, use ½ the listed numbers of seedlings.

** Healthy, mature plants will have multiple stems per plant.

*** This table is not an all-inclusive list of all acceptable species. If the species being evaluated is not present, use the values of a similar species