TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE BOISE, IDAHO SOIL CONSERVATION SERVICE

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PLANT VIGOR CRITERIA

Plant vigor is an expression of the health of a plant. It denotes the relative appearance, vitality, rate of growth, and herbage production of the plant. A vigorous plant has reserve vitality and is free from defects and disease. The relative vigor of the plant determines the vigor of the range.

On many ranges, plant vigor is closely associated with grazing intensity. When ranges are overgrazed, over-rested or understocked, deterioration is often first reflected in plant vigor, followed by changes in plant density, species composition and, at times, soil stability. Changes or modifications of any growth factor, such as soil fertility, soil moisture, precipitation, or the biotic influences of insects, small animals, and big game or livestock grazing, affect the vigor of the plant.

All possible clues to plant vigor must be considered before a final evaluation is made. The greater the number of valid factors considered and evaluated, the greater the confidence in the results and interpretations obtained.

Most research data indicate various criteria established for evaluating plant vigor. For grasses, criteria is most often based on plant height, leaf length, and herbage yield. For shrubs, leaf size, twig length, twig mortality, and production of fruit and flowers are criteria most often used. All of the factors that affect plant vigor are interpreted in herbage production. Therefore, herbage yield is undoubtedly a more accurate measure of plant vigor than any single vegetation character.

Observations and evaluations of plant vigor must be based on complete plant community species composition, to evaluate fully, range condition and trend for any particular range site or area of rangeland. An increase in plant vigor is usually one of the first expressions of range improvement.

Following are criteria which may be used in determining the relative vigor of plants:

Physical characteristics:

1. Size and appearance of plants - plants with poor vigor may have dead centers, decadent appearance, dead branches and/or broken sod.

2. Height and number of stems.

3. Number and size of fruiting bodies or seed heads.

4. Size or area of foliage.

5. Date of renewal of spring growth and rate of foliage development.

6. Herbage production.

7. Color of foliage - uniformly deep natural color to end of leaf tip; no pale, sickly yellowed color, even on leaf tips.

8. Root production - difficult to measure; however, digging up of a few plants can give indications of healthy root systems.

Reference:

Range Research: Basic Problems and Techniques of C. Wayne Cook and James Stubbendiech.