USDA United States Department of Agriculture
Natural Resources Conservation Service

PLANTS

Plant Productivity and Health

Plant Productivity and Health

Improper fertility, management, or plants not adapted to site negatively impact plant productivity, vigor, and/or quality.

What is it?

Plants established in locations where the climate, soils, or moisture availability are unfavorable can be stressed and may not thrive even with excellent management. Natural events such as drought or cultural practices such as grazing and mowing can cause plant stress. Improper management (e.g., exorbitant plant populations)are a stressor that can affect plant productivity and health. Plants under stress are more susceptible to disease and insect damage. Symptoms of poor plant vigor and health may include slow growth, discoloration of leaves, wilting or drooping foliage, leaf drop, root pruning, changes in growth form and discolored roots, and even plant death.

Why is it important?

To meet productivity and conservation goals, it is important that plants are adapted to the site on which they are growing, established in proper populations, provided with enough nutrients, water, and sunshine, and protected from excessive levels of stress.

What can be done about it?

Using conservation practices can help establish and maintain plant productivity and health. Assistance from a crop specialist, grazing land specialist, forester, or biologist may be needed to set realistic production and conservation goals that consider species suitability, soils, climate, management options, and local data for similar cropping/forestry systems. The NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov) is a source of soils information for the growth of crops and trees. Extension programs and educators from local universities are resources for cultural and management practices that keep plants healthy and productive. Nutrient management guides the rate, source, timing, and placement of nutrients as needed to meet production and health goals. Integrated pest management provides techniques to detect, avoid, and treat pests and diseases. Forestry conservation practices can remove and replace unhealthy trees and treat woody debris to reduce risks from insects and diseases. Conservation practices in cropping systems address soil problems such as erosion, compaction, low organic matter, or contaminants through the use of cover crops, new crop rotations, or changes in tillage and/or harvesting methods. Conservation practices in grazing systems can assist in alleviating stressors such as plant vigor and reduced production yields by increasing grazing distribution, managing forage stubble heights, and providing adequate rest periods during seasonal growth variations.

Plant Productivity and Health at a Glance

(continued)

Plant Productivity and Health (continued)

Plant Productivity and Health at a Glance

Problems / Indicators—Yield or growth is substantially less than expected, plants are disease and/or pest-ridden, plants fail to thrive	
Typical Causes	Examples of Typical Solutions
• Plants receive inadequate nutrition during critical growth periods • Plants fail to thrive due to poor soil conditions • Plants wilt, freeze or rot even during normal climate conditions • Plants not adapted to site • Plants are grazed or harvested below adequate stubble heights for adequate energy reserves • Plant community not resistant or resilient to natural or cultural stressors • Plant community management using inappropriate methods, timing, extent, duration, or frequency	• Use nutrient management to address the form, rate, placement, and timing of nutrient application • Consider crop rotations, deep rooted cover crops, drainage, and deep tillage • Consider alternate crops/trees or different plant varieties • Manage grazing periods to alter timing frequency, duration during seasonal growth variations • Manage harvest heights and timing to increase plant vigor and production yields • Improve plant community diversity and structure to restore and maintain plant community health and productivity • Use site-suited, genetically appropriate plant materials • Implement management practices to achieve desired plant community composition, structure, and productivity to maintain ecosystem health • Use appropriate timing, duration, and extent, and frequency of management practices to achieve desired productivity and health outcomes