

Range Management Water Cycle

NE Fact Sheet-9

November 10, 2005

What

The water cycle is the never-ending movement of water from clouds to earth and to clouds again. Influencing those parts of the cycle that affect grassland is important in rangeland management. The cycle begins when precipitation strikes the land, and ends when the water leaves, either through runoff or evaporation. In the interim, livestock producers should store as much water as possible within the soil for use in forage production.

Why

Water is generally the most limiting factor in rangeland, hay, and pasture production. One of three things happens with the moisture that falls as raindrops, snowflakes, sleet or hail: It can be used productively on the site where it fall; it goes downstream as clean water; or, it goes downstream, carrying soil with it. When runoff is dirty, it is taking the land's production potential with it.

How

Impact. When falling raindrops strike bare soil, the impact causes both splash erosion and soil compaction. This results in faster runoff and increased erosion. Good plant cover breaks the force of the raindrops, and allows the water to seep into the soil. The soil can act as a large reservoir, holding moisture, reducing flooding and enhancing water quality. Water stored in the soil promotes a greater and more consistent supply of forage.

Soil. Coarse soil takes in water faster than fine soil, but stores less within the root zone of most plants. Water that moves below the root zone of plants recharges groundwater supplies, and sometimes reappears down slope as a spring or creek. Because this movement through the soil is slow, the water supply downstream is cleaner, and stream flow longer than where moisture runs off over the soil surface. Where the surface is bare, less moisture enters the soil and much of the stored water may evaporate during hot, windy days instead of being used for plant growth.

Plants. A healthier, more productive grassland water cycle can be achieved by proper grazing. Plants and the litter they produce affect the water cycle in several ways. Plants break the impact of raindrops on the soil surface, and serve as small windbreaks to hold snow. They shade the soil's surface causing it to be cooler creating a better environment for plant growth. Litter acts as a sponge, and slows runoff. This gives moisture more time to move into the soil. Plant roots increase soil porosity so water moves more readily into and through the soil. Roots also hold soil particles in place, reducing erosion. Vigorous plant cover is an important part of influencing the grassland water cycle, and making effective use of precipitation.

Where to Get Help

For more information about rangeland, hay, and pasture management, contact the local office of the U.S. Department of Agriculture's Natural Resources Conservation Service. It is listed in the telephone directory under "U.S. Government."