

Range Management: Water Cycle

Fact Sheet

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What is it?

The water cycle is the never-ending movement of water from clouds to soil, through plants, and to clouds again. Influencing those parts of the cycle that affect rangeland is important in range management. The cycle begins when precipitation strikes the land and ends when the water leaves a rangeland either through runoff or evapotranspiration. During this time, a livestock producer should store as much water as possible within the soil for use in forage production.

Why?

Water is usually the limiting factor in rangeland productivity. The moisture in every raindrop, snowflake, or hailstone may be used productively on the site where it falls. Or, it may go downstream as clean water or it may carry parts of soil on which it fell. Whenever runoff water is dirty, a little of the land's productivity is removed.

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. A good plant cover breaks the force of the raindrops and allows the water to move into the soil. The soil affords a large reservoir for the moisture storage—reducing flooding, enhancing water quality and promoting a greater and more consistent supply of forage.

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

Plants. A healthier, more productive water cycle is the result of proper grazing management that increases plant cover and vigor and reduces soil erosion. Plants and the litter they produce affect the water cycle in several ways. They break the impact of raindrops on the soil surface. They serve as small windbreaks to hold snow. 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. They also hold the soil particles in place and reduce erosion. A vigorous plant cover is an important part of influencing the water cycle and making effective use of the precipitation falling on rangeland.

Where To Get Help

For more information on range management, contact the local office of the U.S. Department of Agriculture's Natural Resources Conservation Service or Extension Service.

All programs and services are offered on a non-discriminatory basis.