

Southern Plains Range Research Station (SPRRS)

The Southern Plains Range Research Station (SPRRS) was established in 1913 at Woodward Oklahoma. It is one of the original dry land research centers of the USDA and is administered by the Agricultural Research Service (ARS) of the US Department of Agriculture in cooperation with the Oklahoma Agricultural Experiment Station. The Southern Plains Experimental Range (SPER) was added to the SPRRS in 1940 to give a total area of about 2100 ha including plot areas, farm land and about 1620 ha of native rangeland. The SPRRS is within



The original layout of pastures and initial soil and plant surveys at the SPER were conducted in 1940.

the Southern Plains Region of ARS. The mission of the SPRRS is to develop and transfer innovative production practices based on fundamental ecological principles and to breed, select and release improved plant germplasm to enhance sustainable forage and livestock production from Southern Plains range and pasture lands.

Site description. The SPRRS is located at Woodward Oklahoma (36.42 N, 99.40 W) and the SPER is located about 24 km northwest of Woodward near Ft. Supply Oklahoma (36.62 N, 99.59 W). The predominant native vegetation at both sites is the sand sagebrush mixed prairie:

Climate: Annual precipitation averages 610 mm / year but varies widely from a low of 317 to a high of 1066 mm / year. Precipitation is unimodal with a peak in May. Moderate to severe droughts lasting several years are notable recurring features of the climate. Temperatures range from a high of 45.6 C to a low of -28 C with an average daily high temperature of 21 C and an average low of 8 C. The frost free growing season varies from 155 to 243 days and averages 201 days.

Vegetation Definition, Composition, and Structure: Sand sagebrush (*Artemisia filifolia*) growing to a height of 1 m is the visual dominant in this vegetation type where it may attain 7 to 50% canopy cover. Perennial grasses (short, mid, and tall) are the major complement to the sagebrush. Blue grama (*Bouteloua gracilis*) and sand dropseed (*Sporobolus cryptandrus*) often provide much of the basal cover and forage production. Sand bluestem (*Andropogon gerardii* var. *paucipilus*), little bluestem (*Schizachyrium scoparium*), and switchgrass (*Panicum virgatum*) can be important forage producers and provide a tall-grass aspect if grazing by domestic livestock has not been excessive.



Grazing animal - vegetation responses and basic ecological studies are a focus of research.



Numerous improved forage grasses have been developed and released by the SPRRS.

Prairie sandreed (*Calamovilfa longifolia*) is a major warm-season grass in the northern part of this vegetation type, and the cool-season grasses, western wheatgrass (*Agropyron smithii*) and needleandthread (*Stipa comata*) are important. Sand paspalum (*Paspalum stramineum*), fall witchgrass (*Leptoloma cognatum*), and sand lovegrass (*Eragrostis trichodes*) are important warm-season grasses in the southern mixed prairie, and Texas bluegrass (*Poa arachnifera*) is the only important cool-season perennial.

Seasonally abundant annuals may include hairy indianwheat (*Plantago purshii*), six weeks fescue (*Vulpia octoflora*), annual bromes (*Bromus japonicus*, *B. tectorum*), lambsquarter (*Chenopodium* spp.), buckwheat (*Eriogonum* spp.), mint (*Monarda* spp.), and sunflower (*Helianthus petiolaris*). Perennial forbs, usually not abundant, may include western ragweed (*Ambrosia psilostachya*), stickleaf (*Mentzelia* spp.), hairy goldenaster (*Chrysopsis villosa*), spiderwort (*Tradescantia occidentalis*), and scurfpea (*Psoralea lanceolata*).

Ecological Relationships. Deep sandy soils (loamy sands and sands) on hilly landscapes without well-defined surface drainages are common in this area. Faster infiltration and less water loss to evaporation make sandy soils more efficient than finer textured soils in supplying water to perennial plants in this region where much of the precipitation falls during the growing season; high winds are common, and summers are hot. The more favorable soil water relationship allows this mid grass prairie to extend westward as stringers into the short grass prairie.

The major range management practices in this cover type are: controlling stocking rate and season of use, use of complementary farmed forages, and controlling sand sagebrush with herbicides. Sand sagebrush is believed to increase in density as grazing pressure increases, however, canopy cover by sand sagebrush showed no major trend over 40 years under moderate grazing or in exclosures. The wind erosion potential is high on drastically disturbed areas and on limited areas farmed within this area. Most of the farming is with sprinkler irrigation; areas that were dryland farmed have largely been reseeded to native grasses, or on the southern edge of the type, to weeping lovegrass (*Eragrostis curvula*).



Four instrumented watersheds provide information on runoff and sedimentation.