

MEXICAN NEEDLEGRASS

M.L. Russell¹ and R.Q. Landers Jr.²

West Texas rangelands offer a diverse and productive landscape of native perennial grasses. However, a nonnative grass introduced to West Texas from Mexico is causing significant landowner concern because it is difficult to manage. This problematic plant, Mexican needlegrass (*Amelichloa clandestina*) (Hack.) Arriaga & Barkworth, is an introduced, cool-season, perennial bunchgrass that has established alongside roadsides and fence rows. It also establishes in reseeded pastures, oil and gas reclamation sites, and in native pastures with deep soils. It was first observed in Kimble County in the early 1950s and likely established in the San Saba River Valley in the 1960s. However, misidentification kept it from being officially recorded in Texas until 1987. Since then it has spread throughout the Edwards Plateau and parts of Central Texas.

Very little is known about how to control Mexican needlegrass. It is an opportunistic species that colonizes rapidly and can quickly turn a pasture into a complete monoculture. Native, perennial grasses that are more attractive to wildlife and livestock compete poorly with Mexican needlegrass for light, nutrients, and moisture. It is easy to overlook newly established plants because they are similar in appearance to small clumps of Texas wintergrass (*Nassella leucotricha*), lobed needlegrass (*Achnatherum lobatum*), Nelson's needlegrass (*Achnatherum nelsonii*), and sleepygrass (*Achnatherum robustum*). Over several years the plants grow to a size and color that are similar to Meadow dropseed (*Sporobolus compositus*) with long weeping leaves. Seed heads (inflorescences) may grow 2 to 3 feet tall.

Mexican needlegrass is native from northern Mexico to Colombia, but is now found in pastures and along roadsides in numerous Texas counties (Table 1). Areas in west and central Texas with deep soils are especially susceptible to Mexican needlegrass after above-normal rainfall. Cattle typically avoid grazing Mexican needlegrass because of the sharp-pointed leaves, though goats sometimes eat this grass.

WHAT DOES MEXICAN NEEDLEGRASS LOOK LIKE?

Growth habit

It is a perennial bunchgrass that forms mats, dense tufts, or tussocks, with knotty, rhizomatous bases. Mexican needlegrass looks like Texas wintergrass (*Nassella leucotricha*) in early spring. A mature plant grows approximately 2 feet tall.

Leaves

The leaves are mid to dark green year-round. They are exceptionally rough and spike like. The leaf surface is occasionally hairy (pubescent) with small tufts where the leaf blade and sheath meet. The edges are usually folded or rolled (convolute) with sharp brown points. The dry leaf blade tips are exceptionally rough and can feel like a needle.

When the plants are dry, their leaf blades roll and become rigid and erect. This makes the tips particularly sharp and difficult for grazing cattle to avoid. After rain, the main portion of the blade may flatten, but the tip remains brown and pointed.



Figure 1. Mexican needlegrass is a prolific seed producer which rapidly colonizes on deep soils throughout West Central Texas.

¹ Assistant Professor & Extension Range Specialist

² Extension Range Specialist

Seedhead

The seedhead is a narrow and open to slightly contracted panicle with many spikelets. It is 4 to 8 inches long.

Spikelet

Glumes are about the same length or longer than the floret. There is only one floret per spikelet. Glumes remain on the plant after seed fall (disarticulation).

Floret

The florets are less than half an inch long with a 2- to 3-inch-long curvy awn. The lemma is hairy with a blunt tip (callus).

The most distinctive feature commonly used to identify needlegrass is a swollen crown (corona) at the joint between the floret and the awn. Hidden florets that produce seed (cleistogenes) are frequently present in lower leaf sheaths.

Table 1. A list of Texas counties that have reported dense stands or isolated patches of Mexican needlegrass.

County	Dense Stands	Isolated Patches
Bexar	No	Yes
Bandera	No	Yes
Callahan	Yes	No
Coke	Yes	No
Concho	Yes	No
Cooke	No	Yes
Edwards	Yes	No
Gillespie	Yes	No
Glasscock	No	Yes
Howard	No	Yes
Irion	Yes	No
Kimble	Yes	No
Llano	Yes	No
Mason	Yes	No
Menard	Yes	No
McCulloch	Yes	No
Medina	No	Yes
Runnels	Yes	No
Schleicher	Yes	No
Sterling	No	Yes
Sutton	Yes	No
Tom Green	Yes	No
Uvalde	No	Yes

Reproduction

Mexican needlegrass is prolific and reproduces sexually and asexually. Vegetative reproduction is through 10 to 20 buds at the base of each stem (culm) that are capable of producing tillers. Mexican needlegrass is also known for extensive seed production. It spreads by seeds that develop from open flowers in the seedhead or from hidden seeds (cleistogamous) produced from closed flowers in the lower leaf sheaths. Awns aid in dispersing seeds.

WHY IS THIS GRASS A PROBLEM?

Mexican needlegrass is highly unpalatable to livestock—it can greatly reduce a pasture's carrying capacity and productivity. Consequently, Mexican needlegrass infestation could increase the price of meat and wool products. Heavy infestations also reduce biodiversity and scenic amenity by competing with native grasses and other flora. Because cattle, sheep, and horses avoid Mexican needlegrass, grazing pressure may be higher on more palatable native grasses. Reduced productivity and competition from more desirable grasses may enable Mexican needlegrass to further establish and lower pasture land carrying capacity.

Seeds are spread from infested areas to noninfested areas in various ways, including by attachment to machinery, clothes, or livestock. Harvesting of hay and movement by water also can disperse seeds over long distances. Seed is also spread by wind, although the distance covered is much shorter compared to other methods. The combination of vegetative reproduction by buds and high seed production suggests that a single Mexican needlegrass plant can spread substantially in areas that are suitable for this opportunistic species.

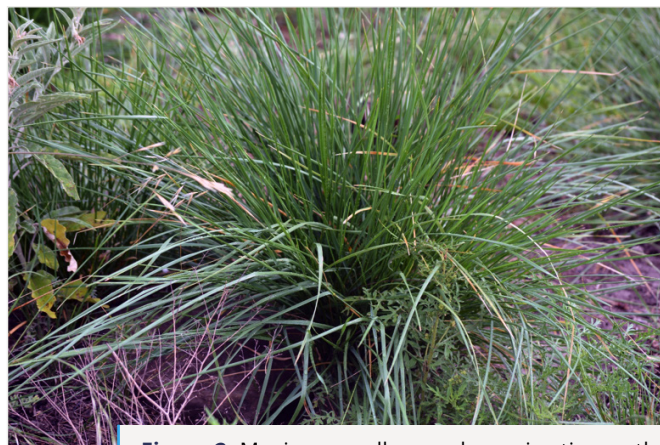


Figure 2. Mexican needlegrass has spiny tips on the end of leaf blades that makes the grass extremely undesirable to cattle, sheep, and horses grazing on infested rangeland.

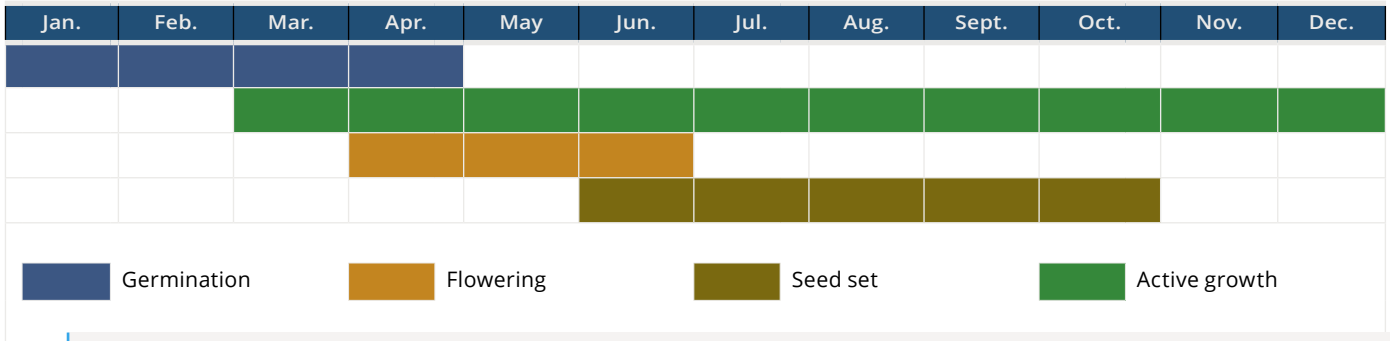


Figure 3. Yearly life cycle of cool-season Mexican needlegrass (*Amelichloa clandestina*) in West Central Texas. Managing Mexican needlegrass is a challenge because it grows actively into the cooler months of early spring, fall, and early winter.

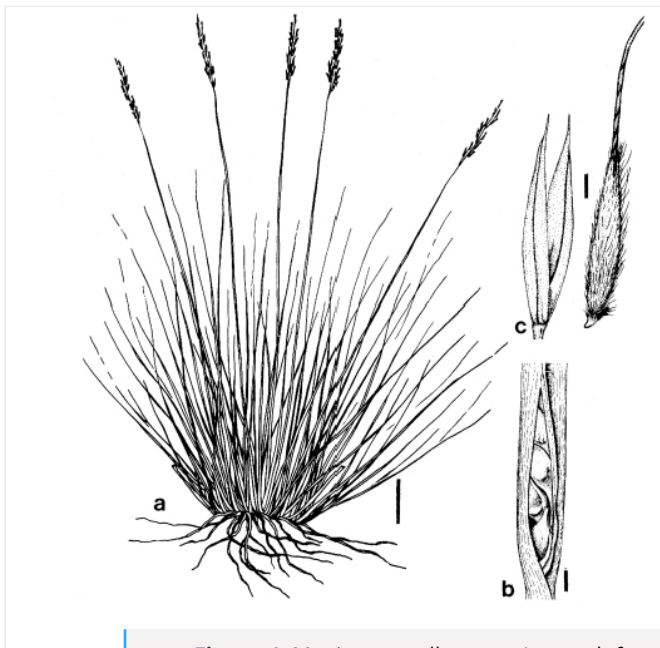


Figure 4. Mexican needlegrass a) growth form, b) hidden seeds (cleistogamous) found in the basal leaf sheaths, and c) glumes and floret (Barkworth et al., 1989; reprinted with permission from *Weed Technology*).

Shredding or mowing intensifies establishment and spread because instead of eliminating the plant, these may disperse the hidden seeds (cleistogamous). This grass species is eaten by goats, and horses will eat it in winter because it remains green and they avoid the sharp tips of the leaves by approaching the bunchgrass from the sides. Controlling the plant with grazing animals is difficult because they usually eliminate everything else first.

Chemical control

Research suggests some populations of Mexican needlegrass can be killed with foliar application of glyphosate at 1.5 percent (individual plant/spot treatment) or soil-applied hexazinone at 2 milliliters per plant while the plants are actively growing.

Prescribed Burning

Burning during the dormant season has shown potential in slowing the seed production and spread of Mexican needlegrass. However, dormant vegetative buds may become activated by the fire and produce rapid resprouting that will need to be treated with a follow-up management strategy.

Additional Resources

Barkworth, M.E., J. Valdes-Reyna, and R.Q. Landers Jr. 1989. *Stipa clandestina*: New Weed Threat on Southwestern Rangelands. *Weed Technology* 4:699-702.

Texas Invasives: http://www.texasinvasives.org/plant_database/detail.php?symbol=ACCL7.

Shaw, R.B. 2012. *Guide to Texas Grasses*. Texas A&M University Press, College Station, Texas.

HOW DO WE CONTROL IT?

Prevention

Once established, Mexican needlegrass is very difficult to control. Prevention through careful management is strongly recommended. Monitoring stock movement and not selling or moving infested hay or machinery is critical. In Mexico, populations of Mexican needlegrass have increased due to heavy grazing or disturbance.

Physical control

Physical control of Mexican needlegrass includes hand weeding or digging, when infestations are small.