



## Cooperative Extension Service

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### **Crop Considerations for Reduced Water Situations in the Middle Rio Grande Region - 2021**

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With water allocation restrictions pending for the MRG region due to drought and low snowpack, many questions have arisen as to which crops will give the greatest yield potential for hay and pasture fields in a short-water year. This guide seeks to inform growers of the pros and cons of various crop options (annual forages) when grown with “less-than-ideal” irrigation.

#### *Spring Crops (March to June)*

Cool-season small grains are commonplace in the MRG forage production systems. These include primarily spring-planted **oats**, but there are also some acres of spring **wheat** and **triticale**, and spring **barley** planted each year. All of these small grains have the potential to produce considerable tonnage under normal irrigation allocations in the region. Yields of up to 5 tons/ac are possible in a well-irrigated and fertilized field. Nutritive value of small grains is excellent and hay made from these crops can be used to feed almost all classes of livestock.

Planting of these crops generally occurs between March 1 and April 1, depending on location within the valley. Often, planting will coincide with the normal first irrigation allocations in March. Most small grains require at least 45-50°F soil temperatures for proper germination, and most can tolerate light freezing conditions. Oats require closer to 50°F for good germination, and all small grains germinate better above 55°F. Soil temperatures at the NMSU Agricultural Science Center at Los Lunas have averaged (max+min/2) 49.7°F over the last week. We are in or nearing soon the optimum planting window for spring-planted small grains, depending on location (north vs. south) within the MRG valley.

The main limitation (after water) of spring-planted small grains is summer heat. Once temperatures start reaching into the 90's, small grains begin to shut down and will move rapidly into 'reproductive' stages of development (i.e., seedhead elongation/emergence). Very late planted crops (April 5 or later) may not produce much vegetative material prior to seedhead emergence, and tonnage can be drastically reduced.

General planting rates for wheat, triticale, barley, and oats is 90-100 lbs/ac for irrigated fields. If planting is delayed, growers should plant on the upper end of this range to compensate for reduced tillering. Make sure spring-planted small grains are properly fertilized with at least 40-60 lbs N/ac (or enough residual soil N is available).

Ideal irrigation period (short allocations; 90-day): Mid-March to mid-June

#### *Summer Crops (May to October)*

Warm-season annual forage crops include species such as teff, millets (pearl), and sorghums (or sudan)\*. These are rapidly growing crops (teff slower) that can produce a lot of forage in a short amount of time. Nutritive value is generally high if harvested at the proper stage of maturity.

Soil temperatures should be in the 60-65°F range (average T° over 7 days) prior to planting. In addition, none of these crops can tolerate freezing temperatures. Mid-May is generally considered safe for planting these crops across most of the region (sooner in the southern reaches). We advise checking the 5- or 10-day weather forecast for potential low temps that could set back germination time or seedling growth. While soil temperatures may be plenty warm for sorghum/millet/teff germination on May 1, it is not entirely uncommon to have freezing cold snaps into the first weeks of May (e.g., 28°F on May 10, 2019).

Moderate- to high amounts of forage (hay or pasture) can be produced in 60 to 90 days of growth. Yield order is as follows: sorghum/sudan > pearl millet > teff. Sorghums and pearl millets can produce as much as 4 to 6 tons/ac in 60 days. Teff yields are more moderate at 3-4 tons/ac if cut multiple times throughout the summer (1.0-1.5 tons/ac per cut). To optimize yield with quality, sorghums (sudans) and pearl millets should be harvested at the boot stage of maturity prior to seedhead emergence. Hay drying will be easier at this stage as well.

Stressed sorghum and millets can accumulate toxic compounds such as nitrates (sorghum and millet) and prussic acid (sorghum). These crops should be tested prior to grazing or feeding hay, especially if drought stressed and if fertilized with moderate- to high rates of nitrogen fertilizer.

Ideal irrigation period (short allocations; 90-day): Mid-May to mid-August

### *Consider Corn?*

Some producers may take a long shot and try corn as either a hay, silage, or grazing crop. The main benefit of this is that corn can be planted early (April) and can utilize those early irrigations sooner. However, there are some major drawbacks to this option. Corn is certainly more attractive for silage operations (e.g., wider rows) than for hay. I've listed the pros and cons below. As you can see, there are more potential problems with water-restricted corn than benefits.

Pros of this scenario: Corn can be planted earlier in April and can tolerate cooler temperatures than sorghum, millet, and teff. Corn has good forage quality, even at immature stages prior to grain development.

Cons of this scenario: Corn seed is expensive; we know very little of how corn will respond to a 'drilled' situation on narrow rows (hay); nitrates can be high in stressed corn; corn stalks are quite large and will be difficult to dry down for hay; water requirement is higher in corn than the other warm-season annuals. If grown for silage cutting, only 90 days of growth may not produce enough ear/starch to be of ideal quality. An ultra-short-season variety may help in this regard. Grazing cattle can be a problem with trampling waste and potential nitrate toxicity.

### *Summary*

If water becomes available in late-March to early-April, then spring oats or other spring small grains MAY be an option if temperatures remain moderate. However, I would expect yield reductions for hay operations, particularly if weather turns off hot and dry. A grazing scenario might be more plausible, as small grains can be grazed at 4 to 6 inches of growth.

If irrigation is not available until after April 5 to May 15, then it is recommended to wait until around mid-May (minimum soil temperatures 60°F or higher) and plant a warm-season annual such as teff, pearl millet, or sorghum/sudan\*. The more southern reaches of the region (e.g., Socorro) may be able to get by

with earlier planting closer to late April to May 1. We must be out of the freeze window for all of these warm-season annuals to survive. Corn could be planted in April, but yields may be severely hindered if water is not available after June, and utilization may be a challenge depending on intended use.

A short irrigation period from April to June is one of the most difficult scenarios for annual crops in the MRG area (central-north), because the 90-day period is not ideal for either the cool-season crops (too late to plant, turns off too hot), or the warm-season options (too early to plant in April, and too short of a growth period for ideal yields from mid-May through June). At least 60 days is needed for good yields for warm-season annual forages.

\*At this time, sorghum forages are not recommended for horse pasture or hay feeding. Sorghum and millet forages have the potential to accumulate toxic compounds (e.g., nitrates) under stress conditions such as drought or with high nitrogen fertility. Additionally, sorghums and millets can accumulate these toxic compounds as young plants and should not be grazed until they are at least 18 inches tall. See website below for more information on these crops.

For more information on small grain and summer annual forages, in addition to alfalfa management under drought and limited water scenarios, visit: <https://forages.nmsu.edu/resources.html>



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