Sorghum Nitrogen Rate and Time of Harvest Study:

2016 Set-Up Protocol

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Introduction

- Brown midrib (BMR) brachytic dwarf forage sorghum is a potential alternative to corn silage, especially when corn planting is delayed due to wet soil conditions or harvest of a 1st cutting of hay or a winter cereal grown for forage (double crop harvest).
- BMR forage sorghum has the potential to fit better in a shorter growing season than some corn varieties.
- Nitrogen fertilizer and harvest guidelines need to be developed for New York.
Project Objectives

- To determine the nitrogen (N) rate of sorghum as part of a double cropping rotation with winter cereals
- To determine the ideal time of harvest to optimize both yield and forage quality
- Sites with 4 replications of 5 N rates:
  - 0 lbs of N/acre
  - 50 lbs of N/acre
  - 100 lbs of N/acre
  - 150 lbs of N/acre
  - 200 lbs of N/acre
Timeline

• Plant in mid May – mid June.
• Weekly harvests from mid-September through mid-October (5 weeks total).
• Weekly harvests are ONLY 100 and 200 lbs N/acre treatments.
• Nitrogen rate trial harvest will include all treatments and be done when the 100 lbs/acre treatment is at the soft dough stage (all treatments harvested that day).
• See harvest materials for a description of the growth stages.
Set-Up Supplies

- Plot map
- 300 ft measuring tape
- 1 striped anchoring pin
- 4 orange driveway markers
- 16 white step-in posts
- 80 flags
  - 16 blue (0 lbs N/ac)
  - 16 green (50 lbs N/ac)
  - 16 yellow (100 lbs/ac)
  - 16 pink (150 lbs N/ac)
  - 16 red (200 lbs N/ac)
  - 16 white (perimeter)
- Soil probe, scarper and bucket
- 4 soil sample labels
- 8 soil bags (4 composites, double bagged)
- Drop spreader for applying fertilizer
- Cooler or shipping container with ice packs
- Camera (if available)
- GPS (if available)
Set-Up Supplies
*5 ft buffer strips can be widened if necessary  
*10 ft plot widths can be adjusted according to planter width
Prior to Setup

- Complete the field history information for the field being used.
- This information is needed to compare results for different sites in the study.
Site Setup

1. Plant the entire trial area with sorghum at recommending seeding rate (likely close to 15 lbs/acre).
2. Place one orange driveway marker on the front left corner of the site.
3. Anchor one end of the measuring tape on the front left corner of the site and stretch 145 ft to the front right corner, place another orange driveway marker there.
Site Setup

5. Repeat steps 2-4 on the back side of the field.
Plot Setup

1. Anchor the tape at the first step-in post on the front left corner, stretch tape to the first step-in post on the back left corner.

Starting at the 5ft tape mark (to include the 5ft buffer), place two flags with corresponding treatment colors every 10 feet to mark the plots (the ends will only have one flag). So flags will be placed at the 5’, 15’, 25’, 35’, 45’ and 55’ tape marks.
2. Move the tape from the left to the right side of the site. Flags of corresponding treatment colors will be placed parallel to those white step-in posts on the front and back sides of the site (at the 5’, 15’, 25’, 35’, 45’ and 55’ tape marks). Repeat this for each set of flags.
Site Setup
Soil Sampling

1. Place the first soil bag in the bucket and place the soil label inside, face down, at the bottom. Then place the second bag inside the first (to avoid label getting wet).
Soil Sampling

2. Using the soil probe, take a total of ten, 0-8 inch-deep soil cores around the inside of each replication (~2 cores per treatment plot). Make sure the two spots are randomly chosen in each plot. Scrape the cores into plastic bags in the bucket.
Soil Sampling

3. After all cores have been taken for a replication, know the bag loosely to allow for easy unpacking.

4. Place the soil sample bags in a cooler/shipping container with ice packs for transport to the NMSP lab as soon as possible for processing and analysis. Call Sarah when completed so we can arrange for pickup.

5. Store in a fridge if there will be a delay in transporting back to the lab.
Fertilizer Application

1. Ensure that all soil samples have been taken prior to fertilizer application.

2. Once soil sampling is completed, fertilizer can be applied. Be careful to apply the correct rate of fertilizer in the corresponding plot using the drop spreader.
*5 ft buffer strips can be widened if necessary
*10 ft plot widths can be adjusted according to planter width
Step-in posts

- After fertilizer is applied, place white step-in posts (or orange driveway markers) where the white flags are on the perimeter of the plots. This will help identify the plot boundaries when the sorghum grows taller than the flags.
Finishing Setup

1. Note the orientation of site and any landmark on the plot map for reference.
2. If possible, include the GPS coordinates of the location and the closest address.
3. Take pictures of the site once set up.
4. Provide a copy of the field history, **field activity sheet** and send back with samples to:

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New York On-Farm Research Partnership

http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership/

There is great power from research information when field data are generated through well designed, repeated and widely implemented trials, with proper data collection and statistically valid analyses.

Consider being an on-farm research partner!

Relevant Questions and Sound Science for Agricultural Profitability and Protection of the Environment