

Forage Crop Research Project Internship

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Internship Synopsis

The focus of the internship is providing the Navajo Nation with data on forage crops that have high yields, economically viable and ecologically stable. The research was conducted on four separate fields with three rows of 12 plots each. Each field site differed in climate, soil and elevation to reflect the different environments present on the Navajo Nation. Data collected from the field experiments are hopefully to be used for secure economic, self-sustaining, environmentally conscious agriculture for the Navajo Nation.

The Land Grant Office

Experience

- Field research experience
- Data collecting and processing
- Large scale experiment processes
- Labor intensive
- Industrial tool and equipment training and operation
- Coffee

The fields

- Each field had its own unique challenges: some being easier to access than others, nearby water sources, local wildlife, precipitation rates and human error.

Tsaile Fields

- Was a good field in an excellent location, that received the most precipitation of all the fields, have good soil and was the closest field with a slightly difficult entrance with large vehicles.
- Prairie dogs infested the nearby areas and made their way into the fields.
- Crows picked the field after the seeds were planted.
- The field was not completely leveled and affected water distribution from the sprinklers.
- Major weed present was field bindweed.

Lower Wheatfields

- A field in a good location, that received the moderate precipitation of all the fields, have good soil and was medium distance field with a slightly difficult entrance with large vehicles.
- Prairie dogs infested the nearby areas and made their way into the fields.
- Crows picked the field after the seeds were planted.
- Local livestock and wildlife made their way into this field and ate some of plots causing moderate loss in yield.
- Major weeds present were small sunflower and field bindweed.
- Moderate difficulty accessing with large vehicles.

Many Farms

- Had the best yield from all the fields.
- Soil was hard baked clay prior to tilling and was a difficult to do so.
- Had moderate to less precipitation in the months of July and August respectively.
- The field was situated in a flood plain that shifted some of the seeds from their plots to others.
- From the drought in August most of the annual forage crops died.
- Major weed present was the kochia weed.
- Easy access for all vehicles.

Teec Nos Pos

- The furthest field away from the office, distance made constant maintenance very difficult.
- Soil was loose sand and with granite stones intermixed.
- Precipitation was the lowest compared to all the other fields.
- Very difficult to enter using large vehicles and towed trailers.
- Major weed present was the Russian thistle.

Initial Start

- All fields had to be cleared and tilled.
- The fields were treated with Streamline herbicide at 1oz/ac.
- After fields were tilled, the seeds were hand broadcasted and then chained over to cover them.
- Initial irrigation was done from the rains during monsoon season.
- Most irrigation and field preparation equipment have not been purchased yet.
- Soiled amendments were not added yet.

Mid-Progress

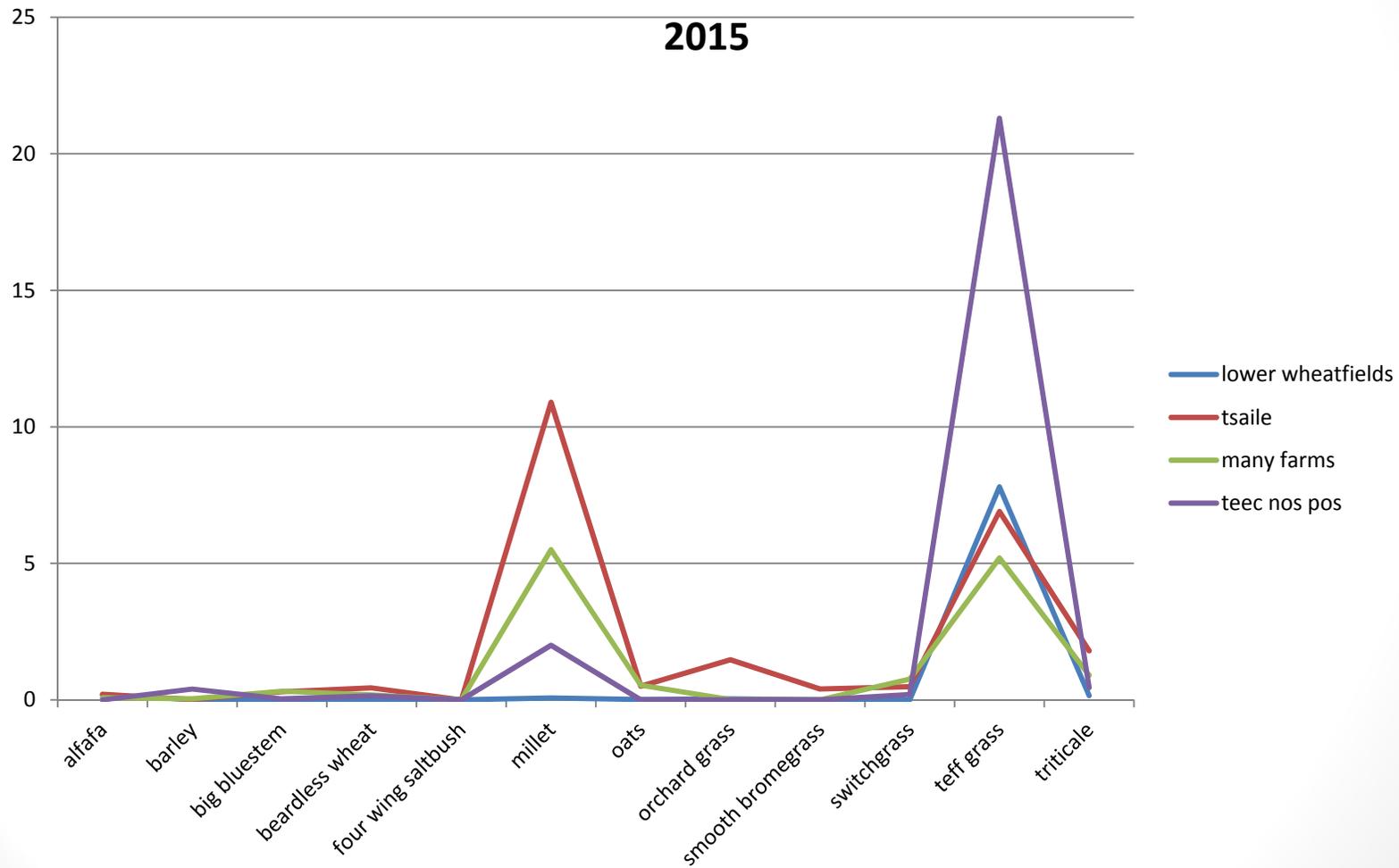
- The month of June was when a majority of the equipment arrived.
- Consistent irrigation was now in effect from the Irripod sprinkler irrigation system.
- Irrigation of Teec Nos Pos field was in planning stages.
- Prairie dogs and crows were being controlled by .22 Magnum and 20 gauge “alternative methods.”
- Soil amendments of manure and sawdust were added to different rows of each of the fields to test if they affected weed population, crop yield and water retention.

Data

“...The only difference between screwing around and science is writing it down.”

-Adam Savage, Mythbuster

Yield vs. Fields



Interpretation

- Graph shows the number of seedlings per square foot of the plot.
- Millet and teff grass were the biggest successes with other seeds sprouting such as oats, triticale and orchard grass making their presence known.
- Other seeds were present in very small numbers but they were affected by a variety of factors and were not as successful.
- Areas treated with the herbicide yielded 167 lbs per acre and untreated plots yielded 1206 lbs per acre..
- Herbicide did affect grass seedlings especially millet.
- Mid summer heat and droughts were a large factor for the death loss of crop seedlings.
- Large populations of prairie dogs were also responsible for losses at the Lower Wheatfields and Tsaille field.

Conclusion

- Pretreatment of Streamline herbicide controlled the weeds but limited the growth of grasses.
- The Irripod system was effective and had an average output of 13 gallons per minute. A field could be fully watered in approximately 2.5 to 3 hours. A team of 5-6 people are able to assemble and disassemble the system in 30 minutes.
- Soil amendments proved to be effective in combating weeds, retaining water and improved crop quantity and quality.
- Data showed which crops had a good chance when managed properly and constantly.
- Questions?

References

- Brock, Dr. John , Technical Consultant of Brock Habitat Restoration and Invasive Plant Management LLC.
- Shorty, Randell “Forage Crop Research Project” (2015) Dine College Land Grant Office intern.
- Tracey, Tiffany “Forage Crops” (2015) Dine College Land Grant Office intern.
- Dine College Land Grant Office.
- Dine College Land Grant Office Interns 2015: Brison Toledo, Daniel Allen, Tiffany Tracey, Tiko Tsinnijinnie, Timothy Wanjala, Tyra White.
- Coffee.