

# The Evaluation of Guar Accessions in the North Dakota High Plain Environment.

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## Introduction

Guar (*Cyamopsis tetragonoloba*) is an annual legume, currently 80% of world production occurs in India and Pakistan but production of Guar grown in the U.S.A. remains low.

Areas in the American West such as Texas and Oklahoma have favorable growing conditions (heat and precipitation) for Guar production. Since the Guar bean is a legume it helps with nitrogen-fixing bacteria and is very valuable within a crop rotation cycle.

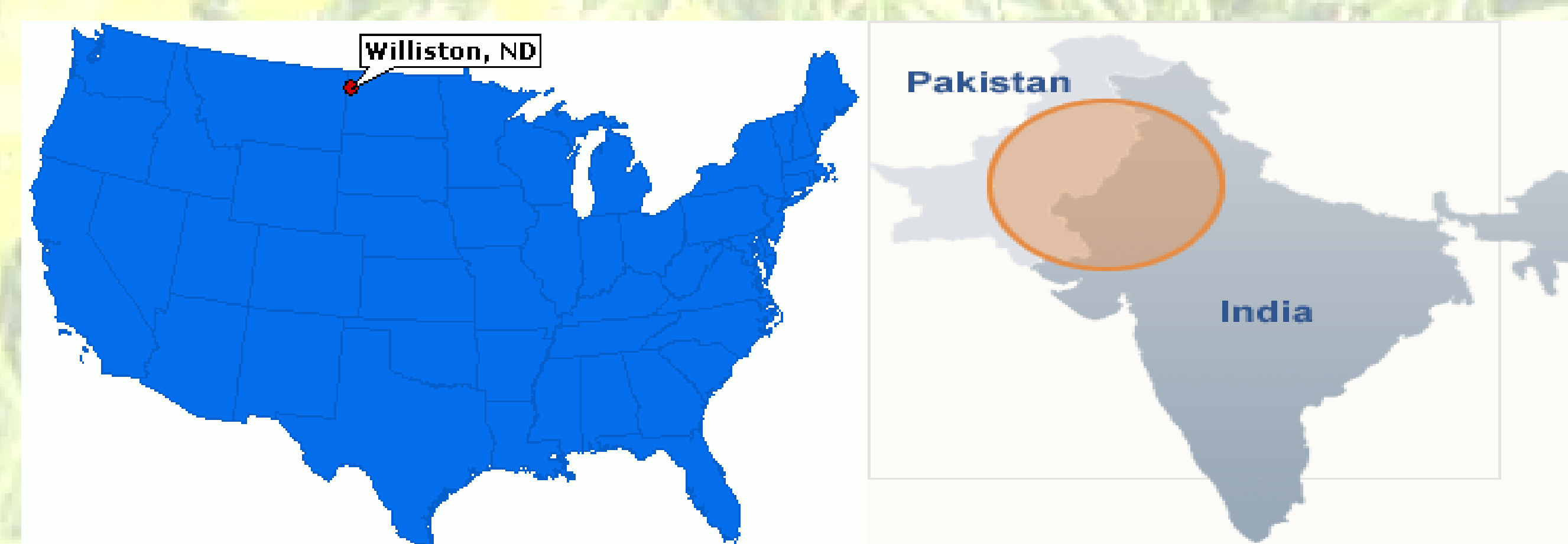
## Guar Products

Guar as a plant has a multitude of different functions for human and animal nutrition but its gelling agent containing seeds (guar gum) is one of its most important use. There has also been interest from the petroleum industry to use Guar for oil fracking.



**Picture 1, 2 & 3)-** Guar Gum is product derived from the Guar plant and is added to a wide variety of products.

## Site Location & Traditional Growing Area



**Picture 4 & 5)-** Locations of Williston North Dakota, high arid plain environment compared to the traditional area of Guar productions in India and Pakistan tropical monsoon region.

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The Nesson Valley Irrigation Research Station located 30 miles East of Williston North Dakota was selected as the test site for the Guar Accession Trial. Guar grows well in arid to semiarid areas, but frequent rainfall is necessary. By having the site at an irrigation station this allowed the Guar to be closely monitored for water needs and irrigated when soils were field capacity. The trial was irrigated 11 times with 6 inches of irrigated water.

The trial composed of 57 different Guar varieties; 10 had 120 day maturity and the remaining 47 had 90 day maturity. Due to the limited amount of seed available, each trial was a single row composed of 45 seeds planted.

The site only had a pre plant burn down application of Spartan at 5 oz. per acre. Weed control was done by hand weeding once a week, from time of emergence (last week of May) till end of August.

## Data collected in 2014

The Guar accessions were grown to assess yield, maturity and quality characteristics. The most promising accessions and selections from the accessions will be increase for further testing in the North Dakota High Plains environment.

Guar Varieties	% Germination	Plant Height (Inch)
288763COL NO 582	33.3	20
430377 Malosan	33.3	17
288757 COL NO 547	28.9	21
426635 K-149	26.7	20
288425 NO 280	22.2	22

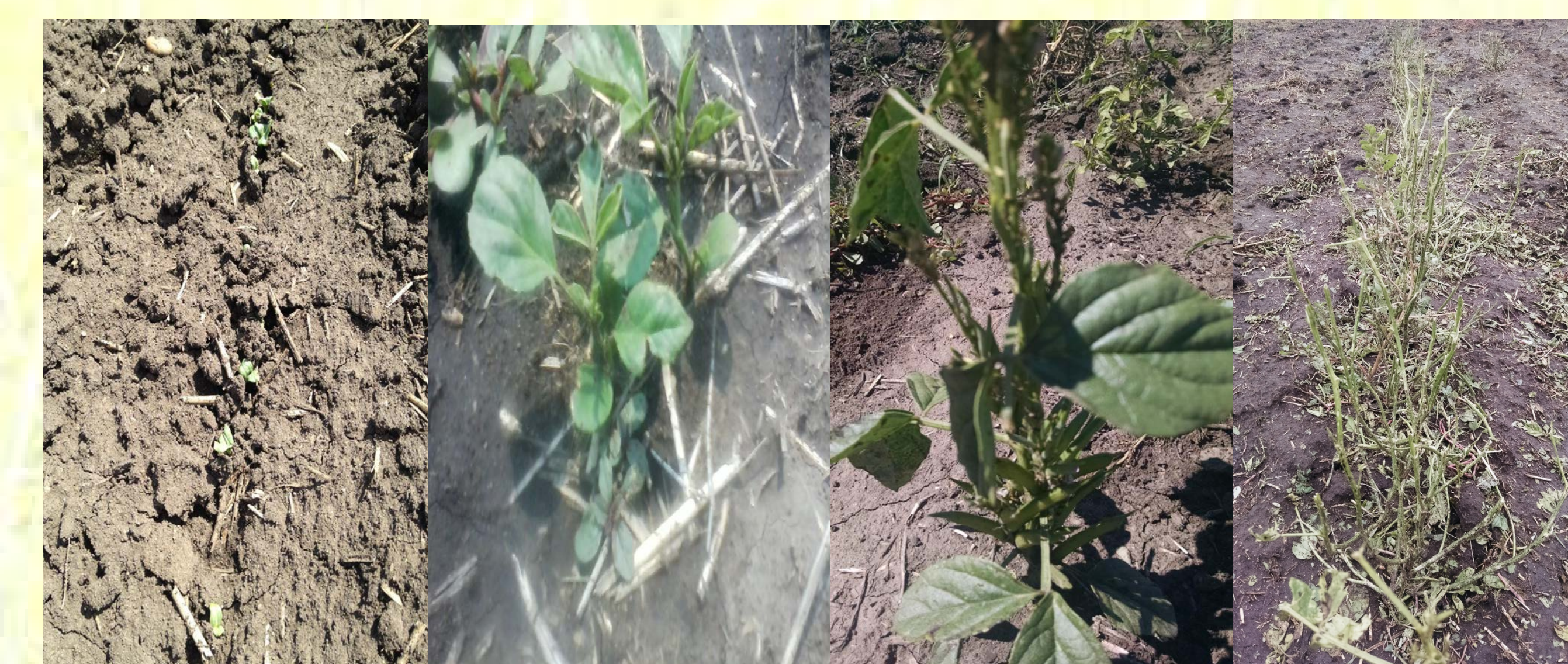
Based on preliminary data there were 5 varieties which were showing the highest stand establishment rates and also grew the largest in terms of plant height and pod development.

### Guar Varieties achieving pod development

288763COL NO 582	4248573 Durgpura Saffed
430377 Malosan	426639 K-553
288757 COL NO 547	426633 K-49
426635 K-149	288759 COL NO 557
288425 NO 280	288749 COL NO 496

By late August there were 10 varieties that had plants developing Guar pods. A cooler than expected late August slowed down growth on the Guar plants.

Unfortunately the Guar plant was destroyed in a large hail storm which hit the Nesson Valley Irrigation Research Station on Sept.2<sup>nd</sup> 2014 before the pods were able to mature. The trial will be planted again in 2015.



**Pictures 6, 7, 8 & 9)** The guar growth from June.5<sup>th</sup>, July.8<sup>th</sup> Aug.27<sup>th</sup> and Sept.3<sup>rd</sup> at the Nesson Irrigation site. The Guar pods were able to develop but were unable to fully mature due to hail damage on September.2<sup>nd</sup> 2014.

## Beneficiaries of the Guar Project

The main beneficiaries of this project would be the farmer's in western North Dakota who would be able to add a new crop to their crop rotations. The legume would fix nitrogen to the soil and naturally revitalize the soil without the addition of extra costly fertilizers.

Other benefits would be to produce a local source of Guar Gum for food processors and the petroleum industry for fracking, and hopefully create a Guar food processing industry in western North Dakota. This would diversify the agriculture cropping rotations for the American farmer while reducing dependency on foreign Guar Gum from Asia.

## Acknowledgements

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