

Promising results from SA guar trials

LEIGHTON PEARCE

SANTFA, with the Department of Manufacturing, Innovation, Trade, Resource and Energy (DMITRE), is exploring the potential of guar as a crop for growers in low-rainfall areas of SA. Trial plantings of this drought tolerant, sun loving, summer growing annual grain legume were established at Port Augusta, Marree and in the Mallee near Loxton last summer. The results from these exploratory trials were promising, and trials are being planned to further investigate the potential of guar in SA conditions, agronomic issues around production of the crop, and to build seed stocks.

Guar is emerging as a low-input, summer-growing opportunity crop with potential for SA growers in semi-arid regions.

Guar, pronounced g-wah, is also known as cluster bean, gavar, guwar or guvar bean. It has been grown in the semi-arid tropic regions of India and Pakistan for centuries, mainly as a rich protein source for ruminants but also as a vegetable and for grain. It can be grazed or cut for hay, and being a legume it also has value as a rotational 'break' and green manure crop.

For SA farming systems guar, a legume, appears to have potential as an alternative, out of season crop with rotational benefits including direct benefits to subsequent crops through its ability to fix atmospheric nitrogen and increase soil nitrogen levels and the ability to improve soil condition, provide a disease 'break' and offer different weed control options.

More than 80% of the world's guar is



WHEN SEED IS SCARCE, SOWING VARIETY TRIALS IS A PAINSTAKING EXERCISE, AS ANDREW BIRD FOUND OUT WHEN GIVEN THE TASK OF ESTABLISHING EARLY-PHASE GUAR TRIALS.



GUAR PLANTS HAVE A DEEP TAP ROOT (RIGHT) THAT ENABLES THE CROP TO ACCESS MOISTURE FROM DEEP IN THE SOIL PROFILE, BUT MATURE PLANTS VARY IN HEIGHT FROM ONE TO THREE METRES DEPENDING ON THE VARIETY AND GROWING CONDITIONS.



produced on the Indian sub-continent, and the western world, despite several failed attempts over the past 100 years, is keenly interested in growing this little bean, which in addition to its traditional uses, is the source of a gelling agent used in the manufacture of products ranging from paper to fire retardants.

The bean of the guar possesses a large endosperm (more than 30% of the bean) that once milled and screened, produces a free-flowing off-white powder known as guran or guar gum, which is identified on food labels with the international food additive number 412.

Guar gum is a gelling agent that has eight times the stabilising and thickening capability of cornflower. It is used in the manufacturing of paper, textiles, pharmaceuticals, cosmetics, toiletries,

explosives and fire retardant, and in the food processing industry in the production of baked goods, dairy goods and fried foods.

More recently guar gum has been found to have application in gas and oil mining.

Mixing guar gum and water with sand grains produces a highly viscous structural gel known as a proppant that is used in hydraulic fracturing (fracking) gas and oil mining to create and keep open rock fractures or fissures. The proppant gel is pumped down a well under pressure to fracture the subsurface rocks and allow the oil and natural gas to flow through these fractures and into the well.

The world-wide growth in the use of fracking to access gas and petroleum trapped in sub-surface rocks has increased demand for guar gum even further in the past two years, with prices increasing by


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900 to 1,000% over that period.

With up to 90% of the sub-continent guar crop exported for production of guar gum for the mining industry, this rapid increase in demand, and price, has heightened interest in guar production in countries beyond the sub continent.

Prior to the use of guar gum in fracking there were several attempts to establish a guar industry in Australia but these failed for a variety of reasons including issues with:

- varietal purity and uniformity
- lack of registered chemical weed control measures
- knowledge of guar agronomy and crop management
- marketing and lack of domestic guar processing facilities.

Many of the agronomic and crop-related issues are being addressed in the current SANTFA and DMITRE research in SA and the recently-established Australian Guar Company, which aims to further the Australian guar industry, is active in the processing and marketing sectors as well as crop agronomy and management. 

TOUGH, FAST-GROWING SUMMER LEGUME

Guar (*Cyamopsis tetragonoloba*) is a fast growing crop that matures in approximately 120 days from seeding.

It is a relatively low input crop compared to many alternative summer crops.

Guar plants are robust and erect, with one main stem and branches along the stem and, depending on the variety (there are more than 100) and growing conditions, grow to a height of one to three metres. Most plants at the Loxton trial site last season grew to 1.5 metres.

The crop requires adequate moisture at seeding but has a large taproot and can access deep sub-soil moisture, so can usually access sufficient moisture at maturity to fill grain. It prefers extremely hot days and high overnight minimum temperatures and will perform well in well drained, infertile medium textured and sandy soils with a pH of around 8.

To ensure good nitrogen fixation by the crop, guar seed requires inoculation immediately prior to seeding with either a guar-specific inoculant or a cowpea Group E inoculant.



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