

Selecting The Seed

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There are a large number of varieties that can be selected and grown. Varieties are generally chosen based on yield, quality and disease resistance characteristics. However other traits such as determinacy, leaf shape and season length may also be important. The full range of cotton varieties available are outlined on the CSD web page. www.csd.net.au

Yield

In irrigated production systems yield is the primary selection characteristic. Some varieties are widely adapted and can perform in a range of environments. Varieties in the Sicot 71 family have demonstrated exceptional yield performance in a wide range of environments. Sicot 74BRF has set a new yield benchmark in full season environments. Other varieties such as the Sicot 43 family only perform well in specific short season environments.

Dryland production systems require varieties that yield well in water limited situations. The best dryland varieties are generally very indeterminate and have robust fibre characteristics. Siokra 24BRF is a variety specifically bred for dryland and tropical irrigated production. Other irrigated varieties with good fibre length can also be grown under dryland conditions. Sicot 74BRF has also performed very well as a dryland variety in full season environments.

The relative performance of cotton varieties can be compared online at www.csd.net.au using the variety comparison tool and the latest variety guide should be consulted to assist in selection.

The final yield of any variety is the product of its yield potential limited by the environment. It is worth your time to select the best performing variety for your farm. In fact different fields on your farm may require different varieties to achieve the highest yields. Varieties can be selected on past performance but most new varieties will have to be selected on their results in variety trials. Historically cotton growers change varieties rapidly to grow the higher yielding replacements. Cotton varieties bred in Australia have demonstrated a 1.8% increase in

BEST PRACTICE

- In addition to yield potential, consider quality traits, disease ranking and leaf shape when selecting variety.
- If planning to access biotechnology traits, contact a Technology Service Provider (TSP) to find out more about requirements and stewardship.

average yield per year, so newly released varieties may be the best choice for your farm

Quality

Australian cotton is regarded as some of the best in the world. Apart from lack of contamination the intrinsic fibre characteristics have been improved by breeding. Fibre length has been increased significantly in the last few years. Fibre strength has also been increased and micronaire values adjusted down to the premium range. Some varieties such as Sicala 340BRF have exceptional quality and may achieve premiums. However Pima varieties have the best quality and generally command a higher price for lint. There is an inverse relationship between yield and most fibre quality traits but through careful selection, breeders have been able to get high yielding varieties with good fibre quality.

Some fibre quality traits are more important in particular environments. In the hotter regions selecting varieties with lower relative micronaire may assist in minimising discounts and achieving premiums. In dryland situations selecting varieties with the best fibre length will reduce the chance of length discounts. Variety selection can also impact on grades. Okra leafed varieties sometimes achieve slightly lower grades than normal leaf varieties due to the leaves 'catching' on the plant and contaminating the lint. Careful defoliation and ginning will limit any grade loss.

Disease

Breeding has provided the main method of managing our major diseases such as verticillium and fusarium wilt. The industry has developed a ranking system (F rank for fusarium and V rank for verticillium) to allow growers to compare the disease resistance of varieties. The ranking systems use a number system to compare new varieties to a standard. A rank of 200 would indicate the variety is immune to fusarium wilt and verticillium. The best commercial varieties available currently have an F rank of about 136 and a V rank of around 112. Breeding aims to improve the disease resistance over time and new varieties generally have improved F rank.

By selecting varieties with the highest disease resistance in fields with significant disease pressure, yields will be maximised. In the case of fusarium and verticillium, selecting the most resistant varieties can reduce spore numbers in the soil, thereby reducing its impact on subsequent crops.

The latest disease rankings are available in the CSD Variety Guide and online at www.csd.net.au.

Refer to Chapter 16 Cotton Pest Management Guide for more information on disease management

Okra leaf shape

The 'okra' leaf shape has been used in some Australian varieties since the early 1980s. It is a useful trait that has demonstrated some resistance to heliothis, mites and

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more recently whitefly. Varieties with 'okra' leaves have also been shown to be more water use efficient. However the trait requires careful breeding to achieve equivalent yields to the best normal leafed varieties.

For more information about cotton varieties go to www.csd.net.au or contact CSD



CSD variety trial

Biotechnology

Today there are two broad classes of cotton biotechnology traits which are approved and available in Australian cotton varieties providing either insect protection, herbicide tolerance or in varieties which are 'stacked' with a combination of both traits.

Bollgard II® technology provides control and aids the management of *Helicoverpa* species in cotton. It expresses two specific proteins isolated from *Bacillus thuringiensis* (Bt) which are efficacious against *Helicoverpa armigera* and *Helicoverpa punctigera*. One of the key benefits of Bollgard II has been the significant reduction in insecticide use which has allowed for an increased adoption of IPM principles as well as providing growers with a consistent platform to manage insect control costs.

Roundup Ready Flex® technology confers full season tolerance to glyphosate herbicides. The ability to use Roundup Ready® herbicide in crop to control a wide range of weeds in crop allows growers to design weed control programs that can target individual fields and specific weed problems. The technology has reduced the reliance on pre-emergent herbicides and has allowed growers to more effectively use minimum tillage techniques and reduce manual weed chipping costs.

Liberty Link® cotton confers tolerance to Liberty® (glufosinate ammonium) herbicide which is registered to control a range of broad leaf and grass weeds in crop. This technology utilises the herbicide glufosinate which has particular strengths including the ability to control hard to kill weeds including weeds like peach-vine which are not well controlled by glyphosate. Liberty herbicide also provides useful control of glyphosate tolerant cotton volunteers.

Accessing biotechnology traits

The access to the various traits is governed by the major technology companies who develop and commercialise the technology via an annual license called a 'Technology User Agreement' (TUA). The TUA forms the basis of the relationship between the grower and the technology company. Its primary purpose is to clearly define the terms and conditions associated with use of the technology in a particular cotton season. It covers a broad array of matters and includes the prices, payment and risk management options for the technology. It also includes stewardship requirements particular to a technology.

In practicality, the actual licensing process is managed by Technology Service Providers (TSPs) on behalf of the technology companies. TSPs are primarily well known local and national retailers of crop protection products and cotton planting seed. Growers should direct initial enquiries about access biotechnology to their local TSP's.

All cotton biotechnology traits commercialized in Australia are supported by an appropriate stewardship program which forms part of the annual TUA between technology owners and growers. The stewardship programs are a product of collaboration between the cotton industry and the developers of the technologies with an aim of supporting their long term sustainable use. This is important to ensure the traits continue to provide value to growers and more importantly provide a basis for the introduction of new novel traits. See Stewardship chapter.

A list of current TSPs can be located at:

www.monsanto.com.au/products/cotton/

www.bayercropscience.com.au/