Germinating ideas

By CSD Extension and Development Team

Following two seasons where higher micronaire levels have been common, most growers are finding this season's crop is in the 'ideal' range. The only exceptions have been a number of reports of penalties for low micronaire. What factors have contributed to the reduction in micronaire?

Micronaire down in 2007–08

Micronaire is a complicated measure because it involves the fineness (linear density and external diameter) and maturity (wall thickness) of the cotton fibre.

There are five key factors that may influence the micronaire of a particular crop:

- Temperature;
- Boll load;
- Stress;
- Defoliation; and,
- Variety.

Based on observations from many of this season's crops, the influences these factors may have had on micronaire are discussed.

Temperature

Generally the higher the temperature during the boll filling period (after 20 days post flowering), the higher the micronaire. Analysis of climate data for this season shows:

- Mean daily temperatures during the months of boll filling (January–March) were on average four per cent cooler than the long term average.
- All districts, apart from southern NSW were below average.
- No districts averaged higher than 27°C — a figure that in previous seasons had triggered more frequent incidences of high micronaire.
- Contrast this with the previous two seasons which were six per cent and nine per cent hotter than average.
- Many districts faced the coolest early autumn in the past 50 years, the period when many late planted crops or crops delayed by herbicide damage were maturing. We would therefore expect a lower micronaire in 2007–08.

Boll load

Some of the highest boll loads for many years were observed in the 2007–08 season (hence the high yields). More bolls per metre can often contribute to lower micronaire because at the time of boll filling, there are more bolls to share carbohydrates around and compete.

Stress

Crops with a late boll set were able to capitalise on the excellent growing conditions from mid Feb to the end of March. Since first position fruit generally has higher micronaire, retaining more fruit on those outer positions and vegetative branches will dilute micronaire in a mild season.

Defoliation

When a high proportion of a crop's yield is in late set fruit, the implications of defoliating too early may be greater. Defoliating a crop before bolls are fully mature results in immature (low micronaire) fibre in the sample.

Some crops experienced a delayed fruit set due to late planting and/or early herbicide damage. Placing the boll maturation period later in the season increases the likelihood of cooler conditions. In all regions this season, the start of April saw a sharp drop in temperatures.

Variety

Varieties vary in their micronaire depending on their inherent fineness and maturity. CSD's Variety Guide provides indicative values for micronaire based on the average results from the previous three season's data where all varieties were included.

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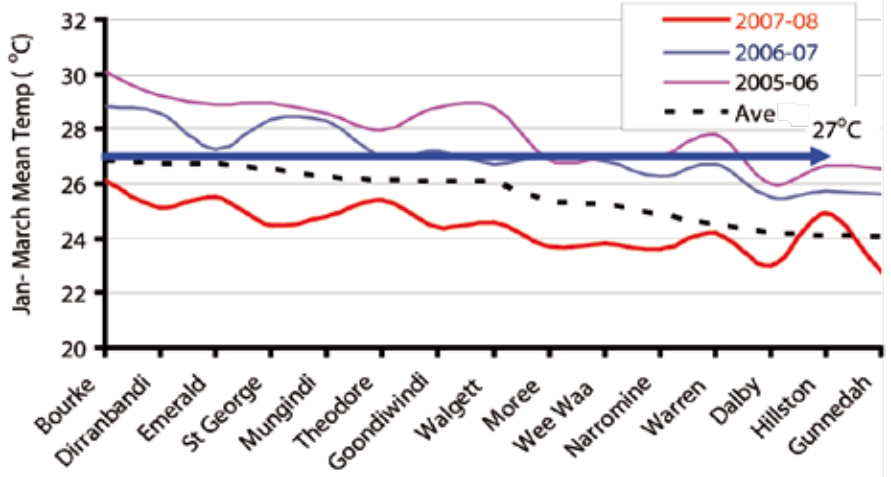
FIGURE 1: Mean daily temperature (°C)

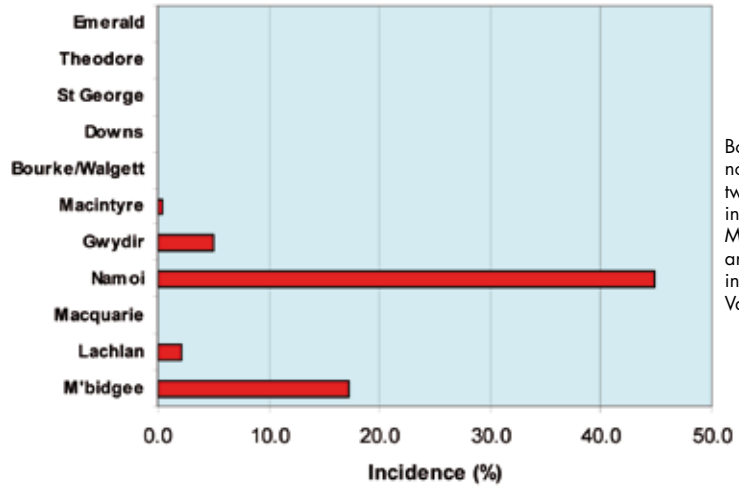


Industry average	2007–08	2006–07	2005–06	Ave
Mean daily temperature (Jan–Mar)	24.4°C	27.1°C	27.9°C	25.6°C
% of long term average	96%	106%	109%	

TABLE 1: Examples of micronaire values for some popular varieties

Variety	Mic Value
Sicot 80BRF	4.3
Sicala 60BRF	4.3
Sicot 70BRF	4.3
Sicot 71BR	4.5
Siokra V-16BR	4.0
Sicot 71B	4.4
Sicot 289B	4.5
Sicot 71	4.4

FIGURE 2: The incidence of black root rot of cotton in the 2007–08 season



Bourke and Walgett not assessed. Only two crops were inspected in the Macquarie Valley and four crops in the Macintyre Valley.

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The relative difference between each variety will on average, remain reasonably constant if all other things are equal. For example, if you got a micronaire of 3.7 with Sicala 60BRF, then Sicot 71BR would have been about 3.9 in the same situation.

Cooler conditions favoured disease all-round

Milder seasonal conditions, accompanied by significant periods of very wet and/or very dry weather, had a considerable effect on disease incidence and distribution. A summary of the annual cotton disease survey conducted across NSW and Queensland for key diseases is provided below. Acknowledgements to Chris Anderson and Peter Lonergan (NSW DPI), Linda Smith and Linda Swan (QDPI&F), Stephen Allen and Greg McNamara (CSD) for compiling this report.

Black root rot

The later plantings of Queensland crops last season when conditions were warmer, confined black root rot incidence to the major valleys of NSW (Macintyre, Gwydir, Namoi and Macquarie). Black root rot was observed in 50 per cent of fields and 24 per cent of plants surveyed in these valleys compared to 58 per cent and 14 per cent respectively in the previous year.

The Namoi valley was again the worst affected with black root rot present in 85 per cent of fields inspected and on average 45 per cent of plants affected (over 80 per cent in three fields). Also of concern was the increase in incidence in the Murrumbidgee Valley with over 17 per cent of plants affected in the 2007–08 season (compared to average two per cent in previous five seasons).

Verticillium wilt

The incidence and severity of Verticillium wilt experienced this past summer was almost akin to those of the 1990s when Sicala V1 was first released. Milder, below average temperatures combined with wet, cloudy weather, particularly through December, created ideal conditions for Verticillium wilt. Foliar symptoms of Verticillium wilt observed this season are normally not apparent in mid-summer.

The Namoi Valley as usual experienced the greatest incidence of Verticillium wilt with almost 30 per cent of plants affected compared to around 10 per cent in the previous two seasons (Figure 4). In one field almost 90 per cent of plants were affected, highlighting the importance of varietal selection.

Host plant resistance to Verticillium wilt is only partial resistance and temperature sensitive. Even varieties with a high V. rank can become completely susceptible under cooler conditions. To illustrate, in the Verticillium nursery at ACRI, near Narrabri, the incidence of Verticillium wilt in Sicala V2 was 49 per cent in 2006–07 compared with 85 per cent in 2007–08.

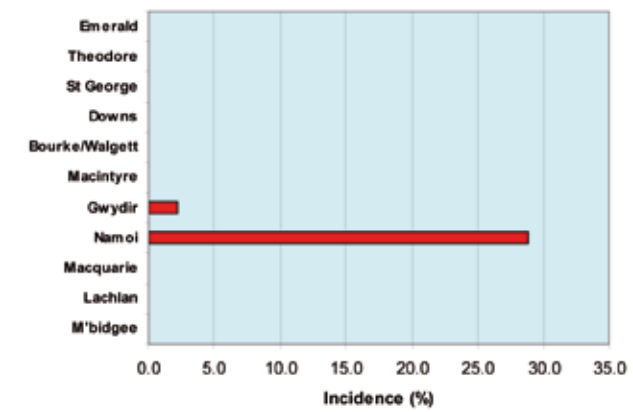
Fusarium wilt

Three new cases of Fusarium wilt were reported in 2007–08, one in the Gwydir and two in the Theodore area. The importance of early detection and establishment of a management program is stressed.

Fusarium wilt was most common on the Darling Downs where the mean incidence of 11.4 per cent plants affected was the highest recorded in over six years of surveys (69 per cent of plants affected in one field alone). The disease was found in nine out of 13 crops inspected — this despite the avoidance of problem fields due to limited water, delayed planting and the use of more resistant varieties.

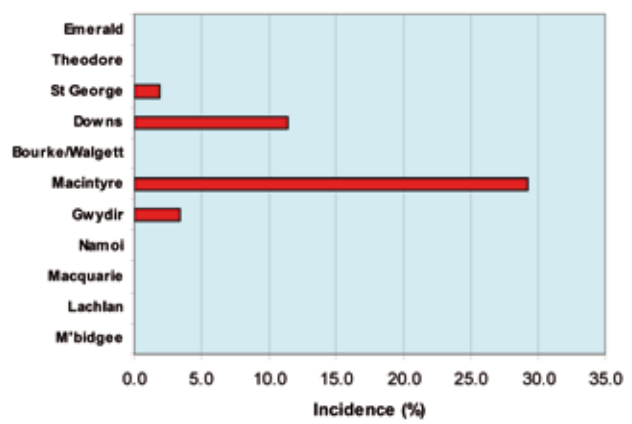
The reported high incidence of Fusarium wilt in the Macintyre Valley is misleading with disease in only two of four crops surveyed and over 80 per cent of plants affected in one of those crops.

FIGURE 3: The incidence of verticillium wilt in March 2007–08



Bourke and Walgett not assessed. Only two crops were inspected in the Macquarie Valley and four crops in the Macintyre Valley.

FIGURE 4: Incidence of Fusarium wilt of cotton in the 2007–08 season



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