

Diseases of Cotton

TRENDS

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**NSW DEPARTMENT OF
PRIMARY INDUSTRIES**



Australian Government
**Cotton Research and
Development Corporation**

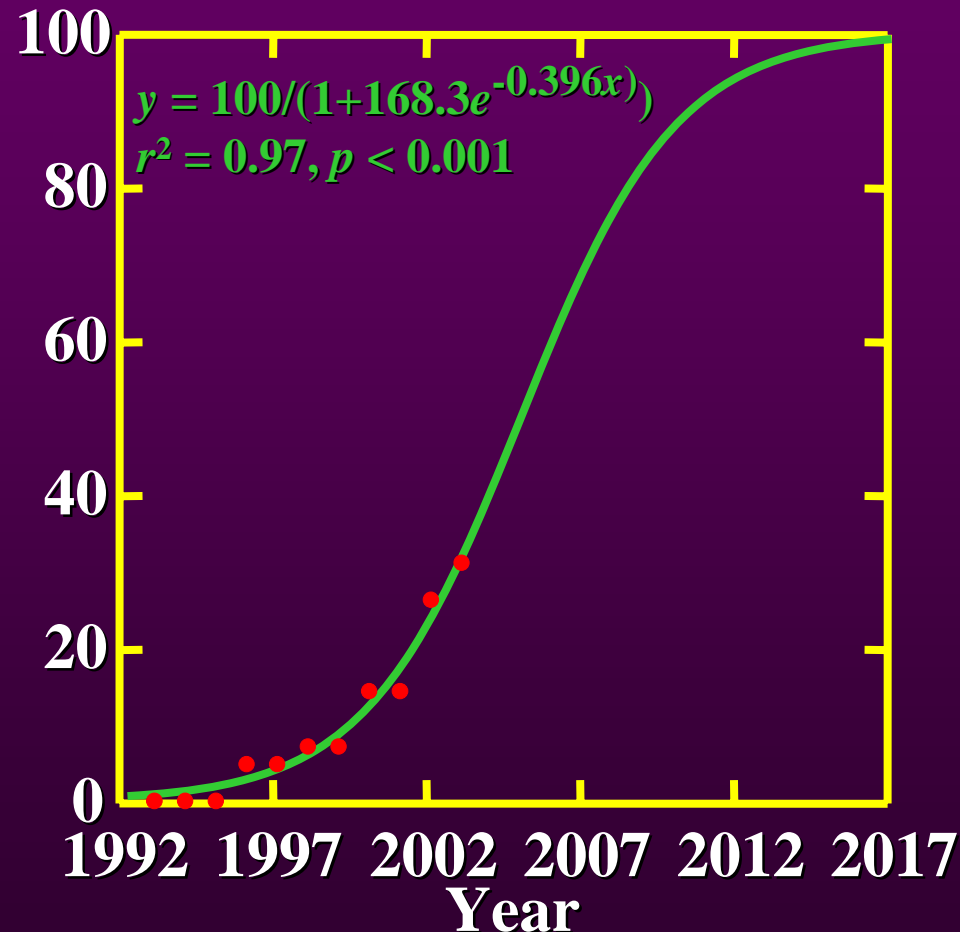
Increasing Fusarium wilt

- Now confirmed on 82 farms in NSW
- In 9 of 11 irrigated crops on the Downs



2003 - “on 90% of farms by 2010!”

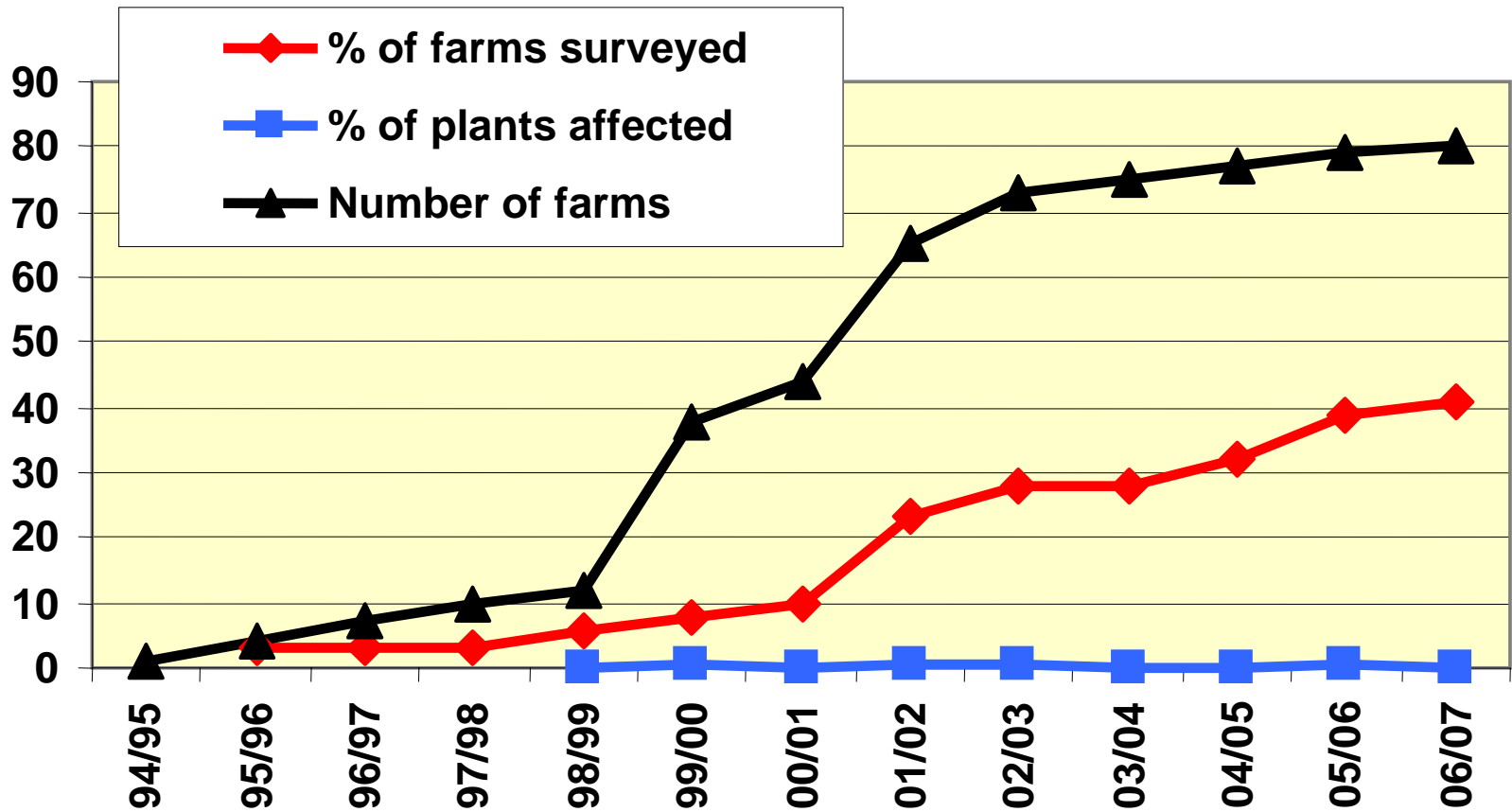
**%
of farms
in NSW**



(Dr David Nehl, NSW DPI)

NSW - Disease survey results:

Fusarium wilt of cotton in NSW

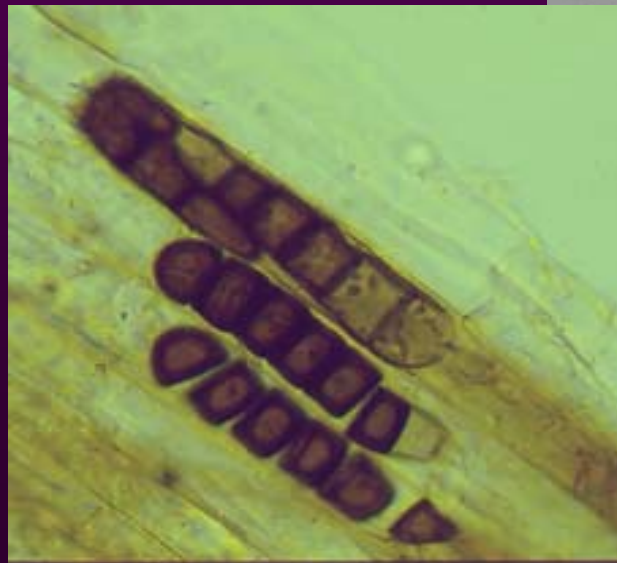


Why?

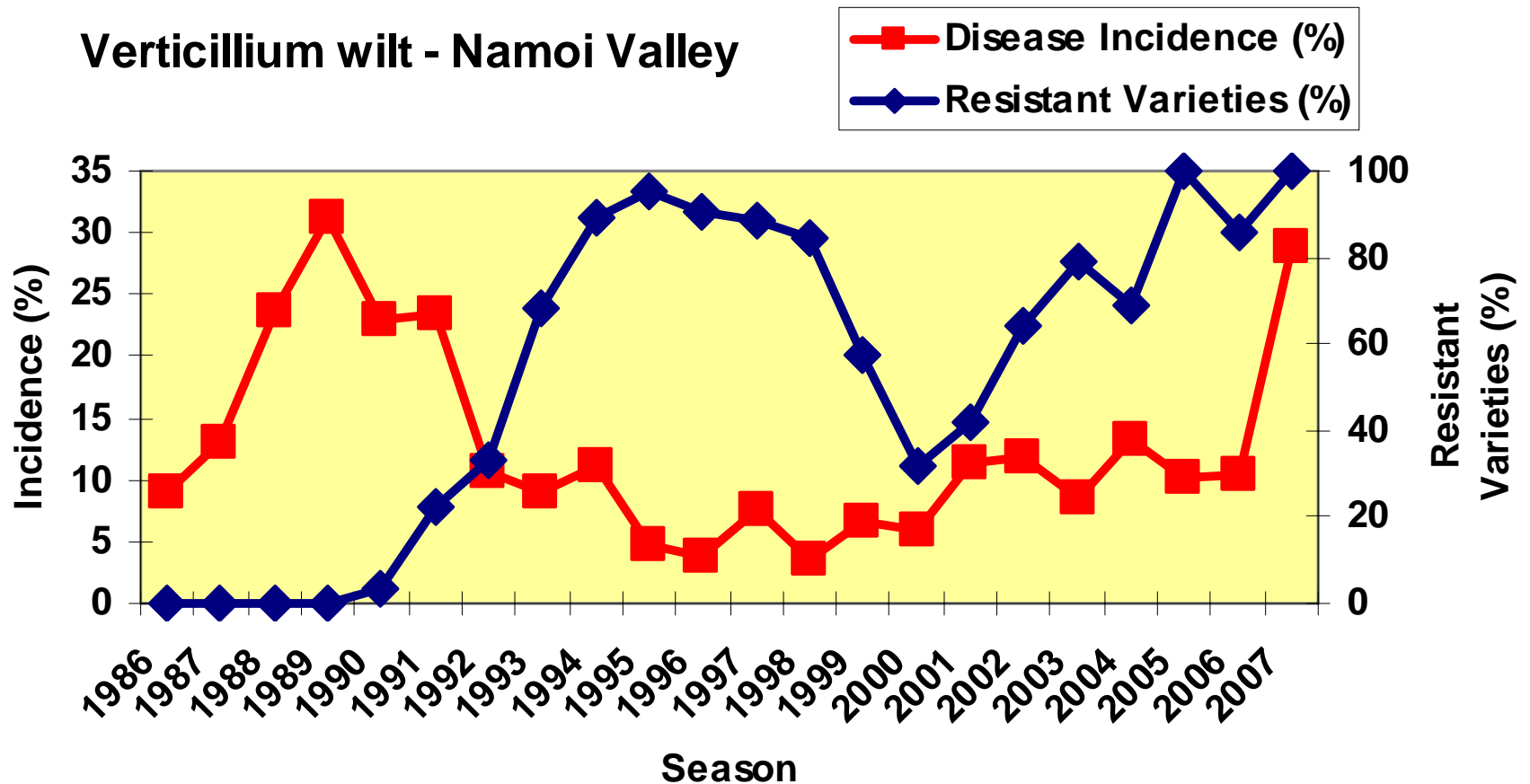
- Adoption of more resistant varieties?
- Less favourable weather (drought)?
- Grower unwillingness to report?
- The impact of better farm hygiene?

Increasing black root rot

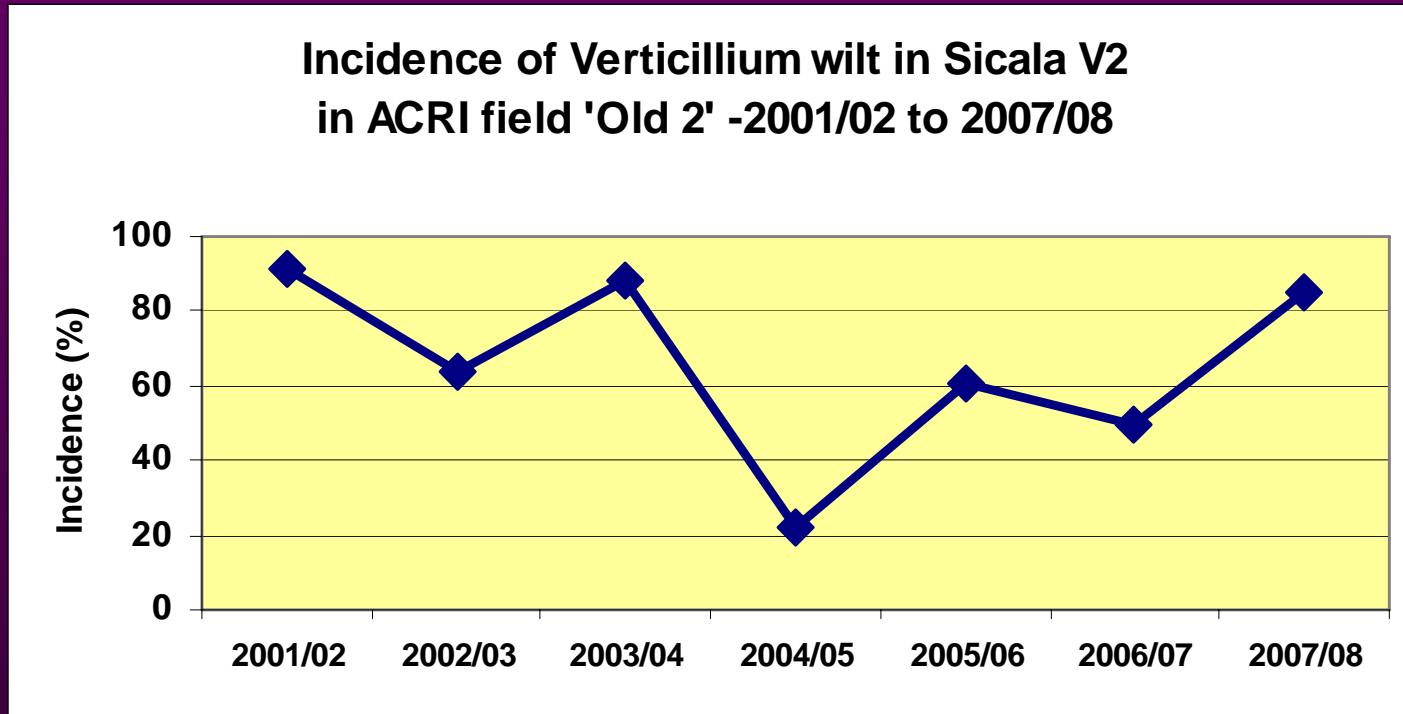
- Now in all regions
- Particularly in NSW
- Especially in the Namoi
- Building in the South



Increasing Verticillium wilt?



Same variety in the same field for the last 7 seasons



- Seasonal conditions are important!
- In a cool season our resistant varieties are more susceptible

Adoption of farm hygiene practices

Increasing / decreasing (?)

Protection against weeds, diseases and exotics!!

KEEP THIS FARM

FUSARIUM WILT FREE

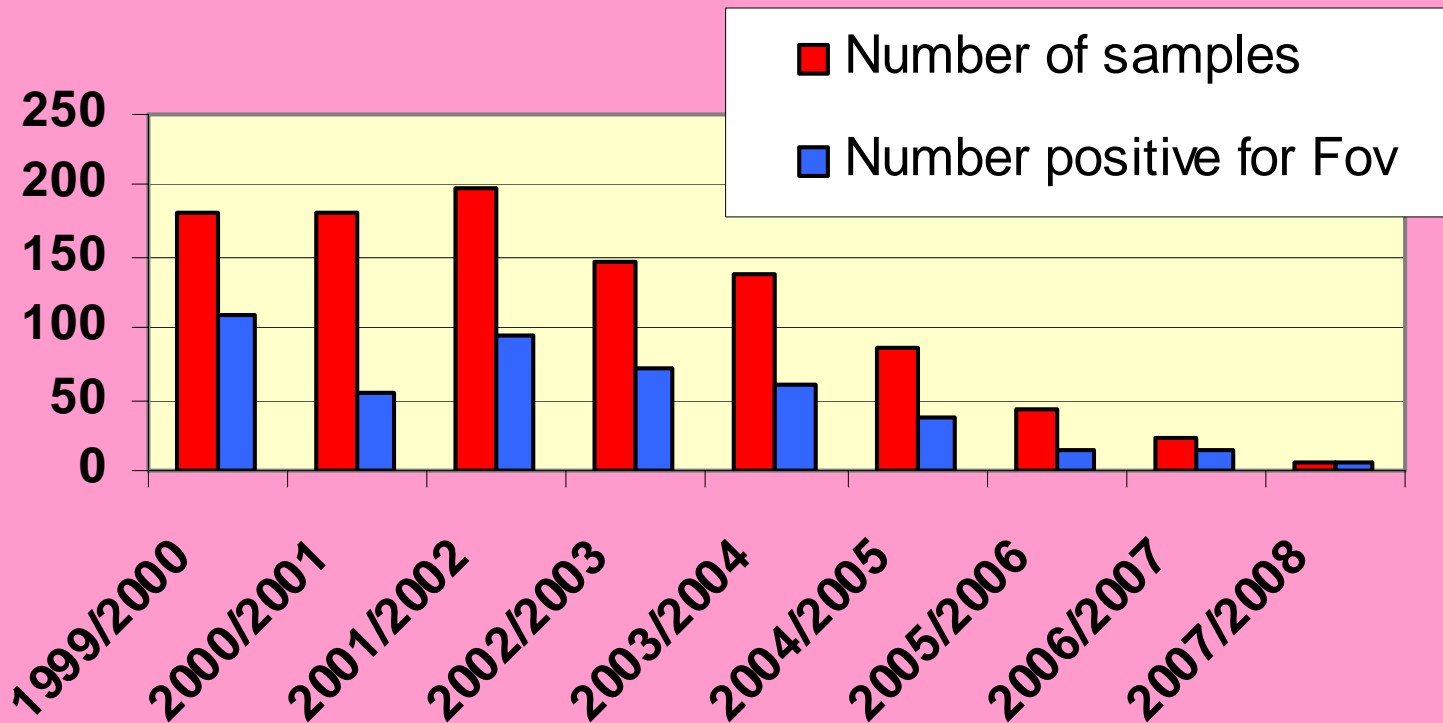
COME CLEAN-GO CLEAN

NO DIRTY VEHICLES ALLOWED



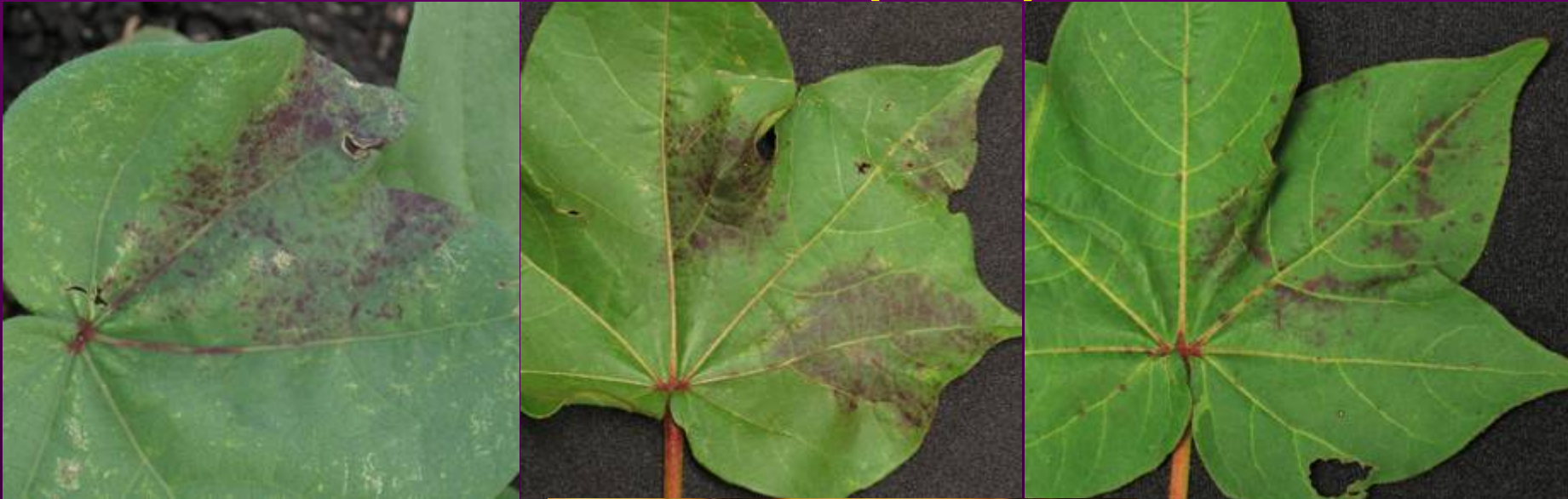
Decreasing use of the FREE Fusarium diagnostic service

QDPI&F Fusarium diagnostic service

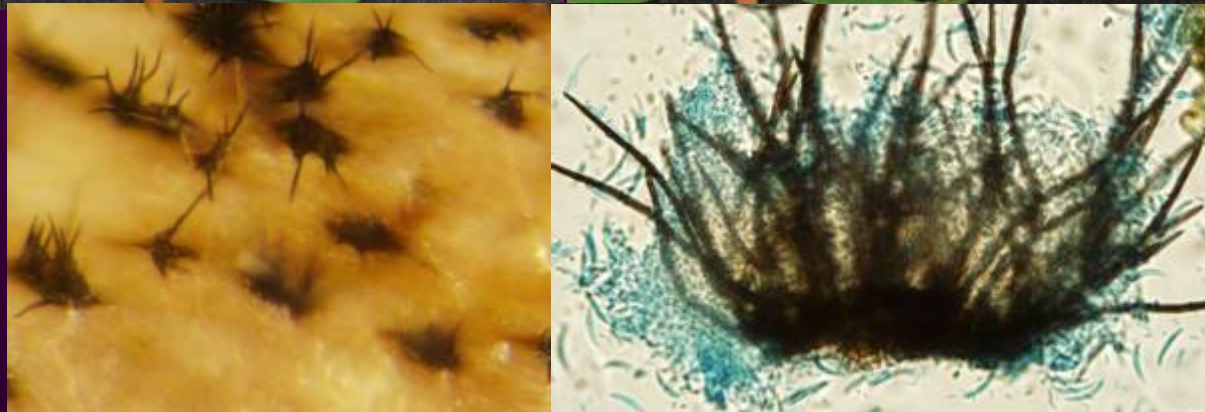


Emergence of new diseases

- Tobacco Streak Virus (TSV)



- Anthracnose



Increasing diversity of rotation crop options

- ***Cereals***
 - Good for Verticillium and black root rot control
 - But – can allow build up of Fusarium
- ***Legumes***
 - Good for N cycling
 - But - increases seedling disease & black root rot
- ***Sorghum, legumes etc.***
 - Watch out for allelopathy!

Increasing interest/use of overhead irrigation

- *Where are the roots? Where is the pathogen?*
- *Will overhead irrigation bring them closer?*
- **Will overhead irrigation result in a higher incidence of black root rot, Verticillium and Fusarium?**
- **With Fusarium - inoculum was mainly in top 16cm – incidence up 24% with mulch**

0-15cm - Between rows



Furrow irrigation

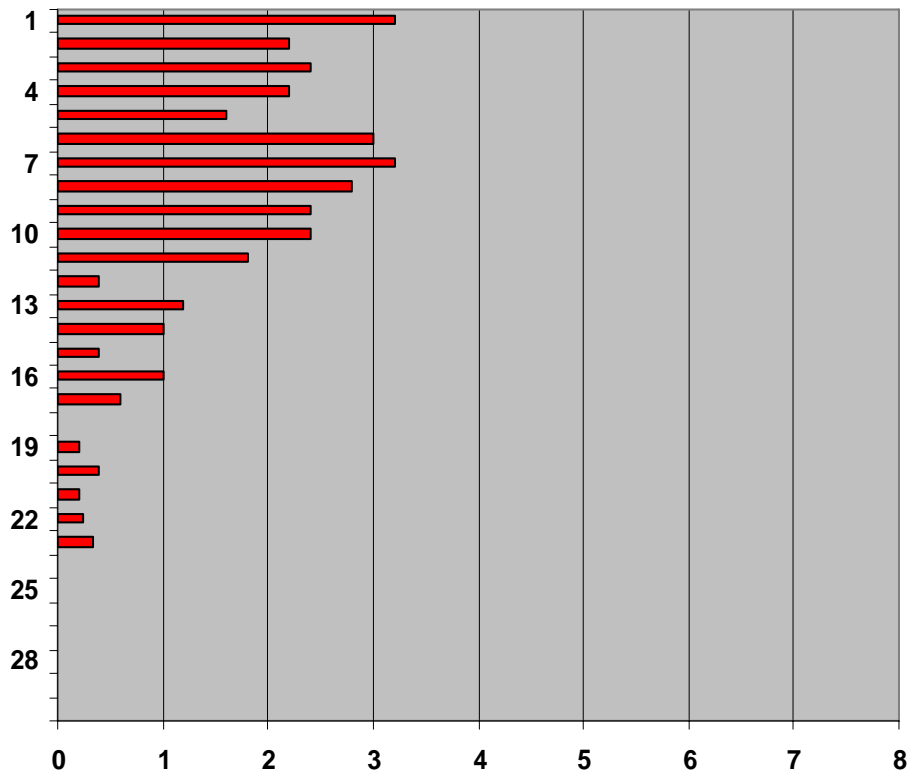
Lateral move irrigation

Number of secondary roots attached to top 5cm of tap root:

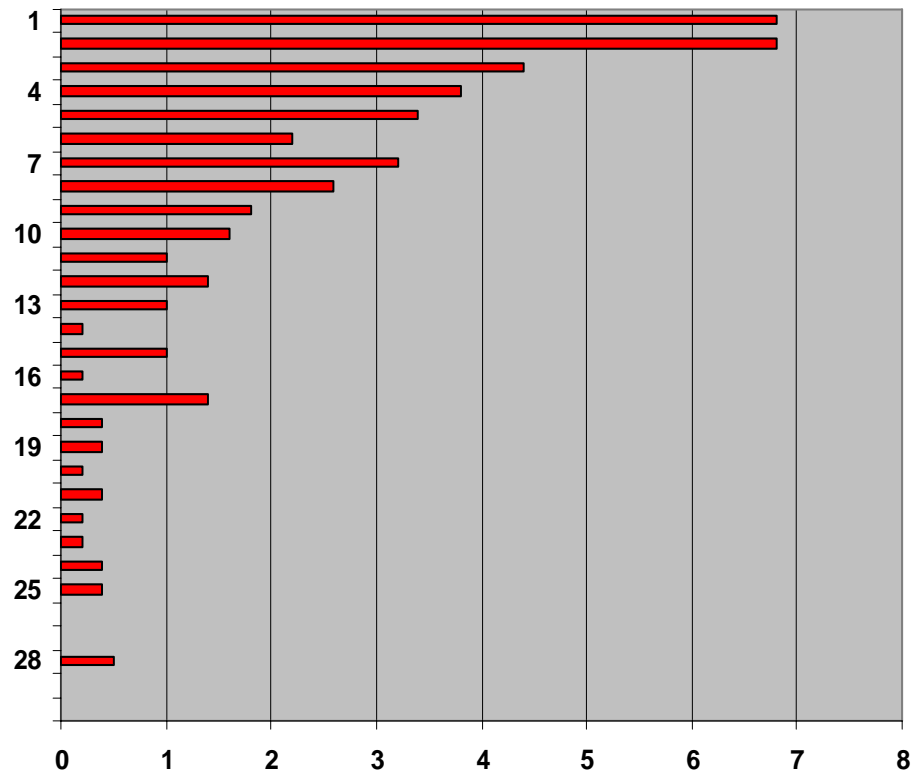
11.6

25.2

Furrow irrigation
Number of secondary roots/cm of tap root



Lateral move irrigation
Number of secondary roots/cm of tap root

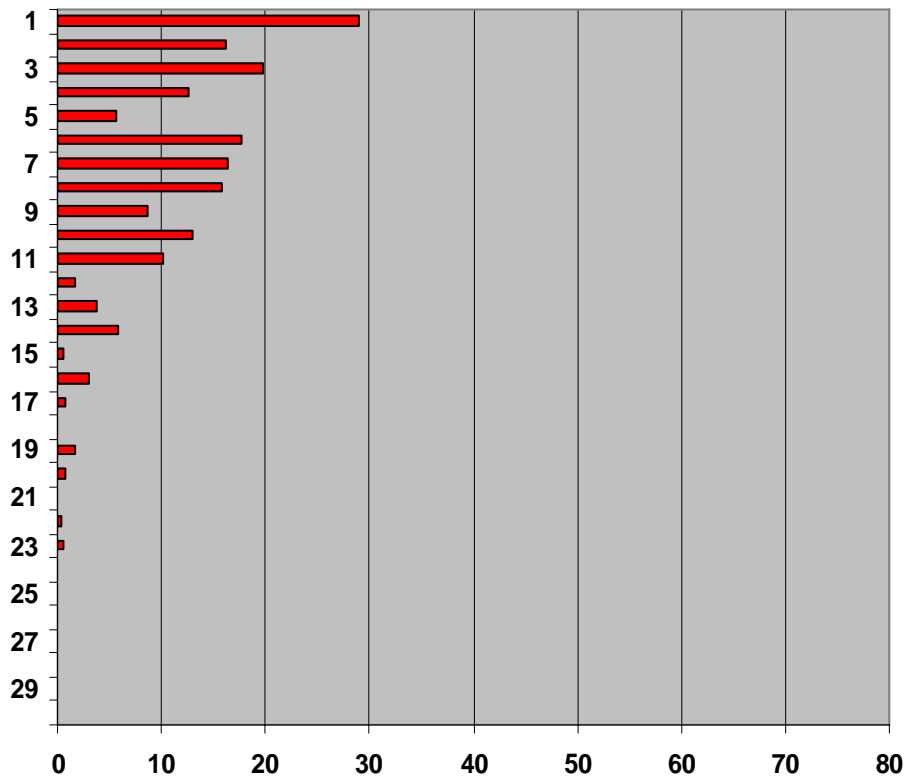


Length of secondary roots attached to top 5cm of tap root:

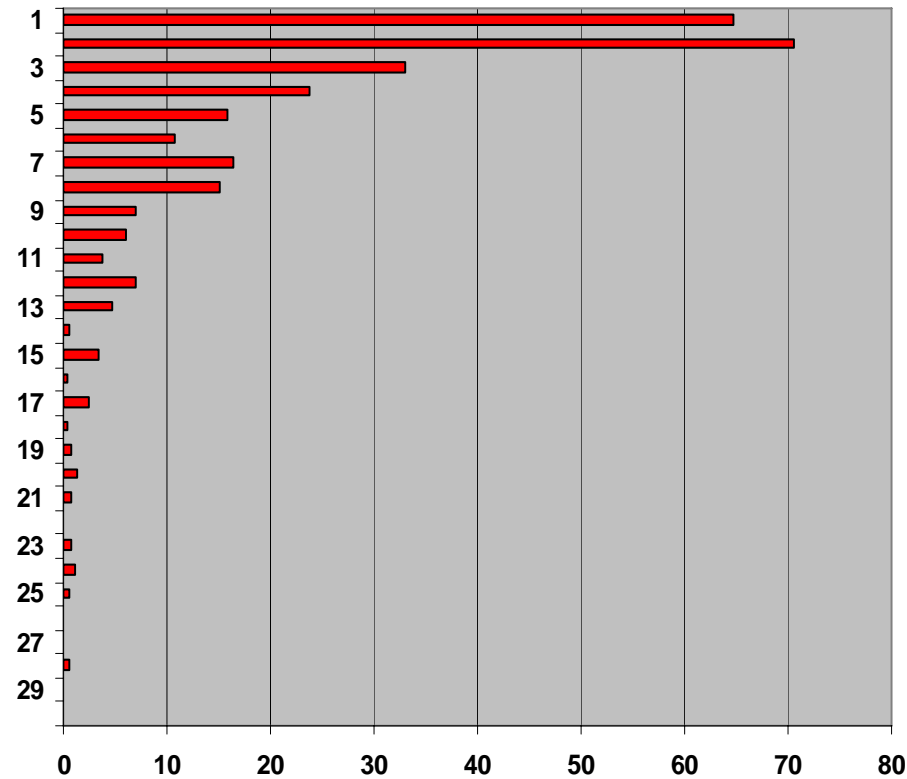
83 cm

208 cm

Furrow irrigation
Length of secondary roots/cm of tap root



Lateral move irrigation
Length of secondary roots/cm of tap root



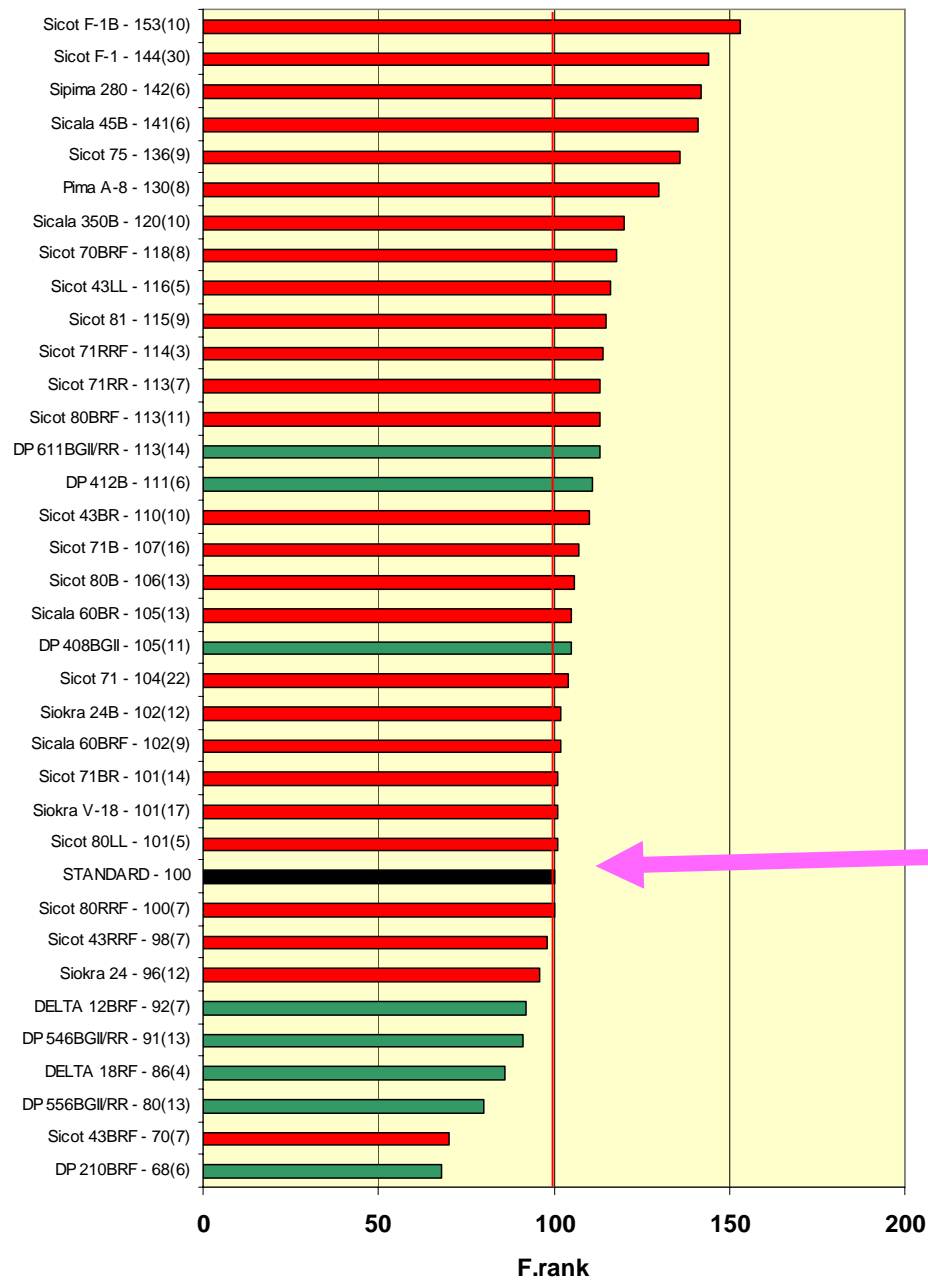
These are negative trends!

Are there any positive trends?

Increasing host resistance to Fusarium wilt

- **Sicot 189 used to be one of the most resistant varieties**
- **NOW :-**

2008 Fusarium wilt resistance ranking



Sicot 189

Global warming?

- If 'global warming' means higher temperatures
 - Then the incidence and severity of:
 - Seedling diseases
 - Black root rot
 - Verticillium wilt
 - Fusarium wilt
- should decline

Increasing surveillance & biosecurity awareness

- **The ‘National Cotton Biosecurity Plan’ has been written**
- **Priority Pests have been identified**
- **Plans for increased surveillance are in place**

Increasing awareness of soil ecology

- Our soils are a living treasure
- Soil ecology is soil biology in a background of soil physics and chemistry
- When we plant a crop, add fertiliser and water and cultivate we change the balance

- Plant pathogens and pests are nature's defence against imposed monocultures and not a sign of soil 'sickness'
- The control of soil-borne diseases is not an issue of correcting a soil imbalance but a challenge to adjust the ecological balance to the detriment of the pathogen.

Increasing acceptance of Integrated Disease Management

- *IDM for Verticillium wilt*
- Use varieties with V.ranks > 100
- Manage for earliness
- Avoid late season irrigations
- Incorporate residues soon after harvest
- Rotate with non-hosts (cereals, sorghum)
- Control alternative weed hosts
- Minimise your tailwater
- Always practice good farm hygiene

- **IDM for Fusarium wilt**
- Plant a high F.rank variety
- Use Bion seed treatment
- Delay planting to the end of October
- Avoid cultivating with knives
- Retain cotton residues on the surface
- Bare fallow rotation is best
- Burn, bury or bale cereal residues ASAP
- Minimise your tailwater
- Summer flooding if possible
- Always practice good farm hygiene

- **IDM for black root rot**
- Use varieties that can 'catch up'
- Use Bion seed treatment
- Prepare beds well
- Pre-irrigate and/or plant into moisture
- Delay planting if possible
- Rotate with non-hosts for up to 3 years
- Avoid legumes and control weeds
- Effective biofumigation
- Minimise tailwater
- Summer flooding if possible
- Always practice good farm hygiene!