

# Evaluation of fluopicolide-containing formulations for the control of potato late blight in Northern Ireland

Louise R Cooke<sup>1,2</sup> & George Little<sup>2</sup>

<sup>1</sup>The Queen's University of Belfast

<sup>2</sup>Agri-Food and Biosciences Institute

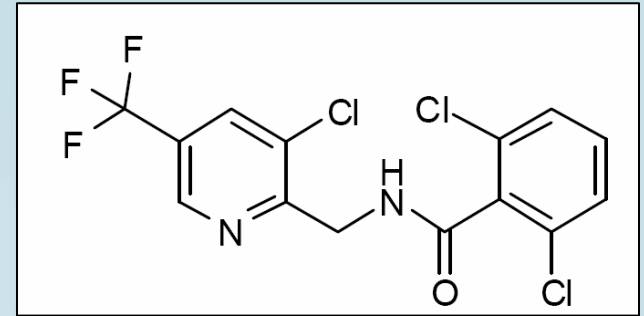
# ***Late blight in Northern Ireland***

- ***Weather conditions favour blight in most years***
- ***8-9 fungicide applications per season***
- ***Fungicide costs c. £1 million (€1.5 million)***
- ***Estimated yield loss 5%***
- ***Tuber blight potentially a major problem***



# Fluopicolide

- **Novel chemistry developed Bayer**



- **Placed by FRAC in a new mode of action group**
- **Interferes with functioning of spectrin, which is involved in stabilising the cytoskeleton**
- **Oomycete-specific**
- **Translaminar activity**
- **Launched in 2006 for late blight control as 'Infito', a co-formulation with propamocarb hydrochloride**

## ***Field trials 2003-2006***

- ***Conducted at Newforge, Belfast on cv. Up-to-Date***
- ***4-drill plots (10 tubers/drill)***
- ***5 replicate blocks***
- ***Trials planted early-mid May***

**BL1**

**POTATO BLIGHT FUNGICIDE EVALUATION TRIAL LAYOUT**

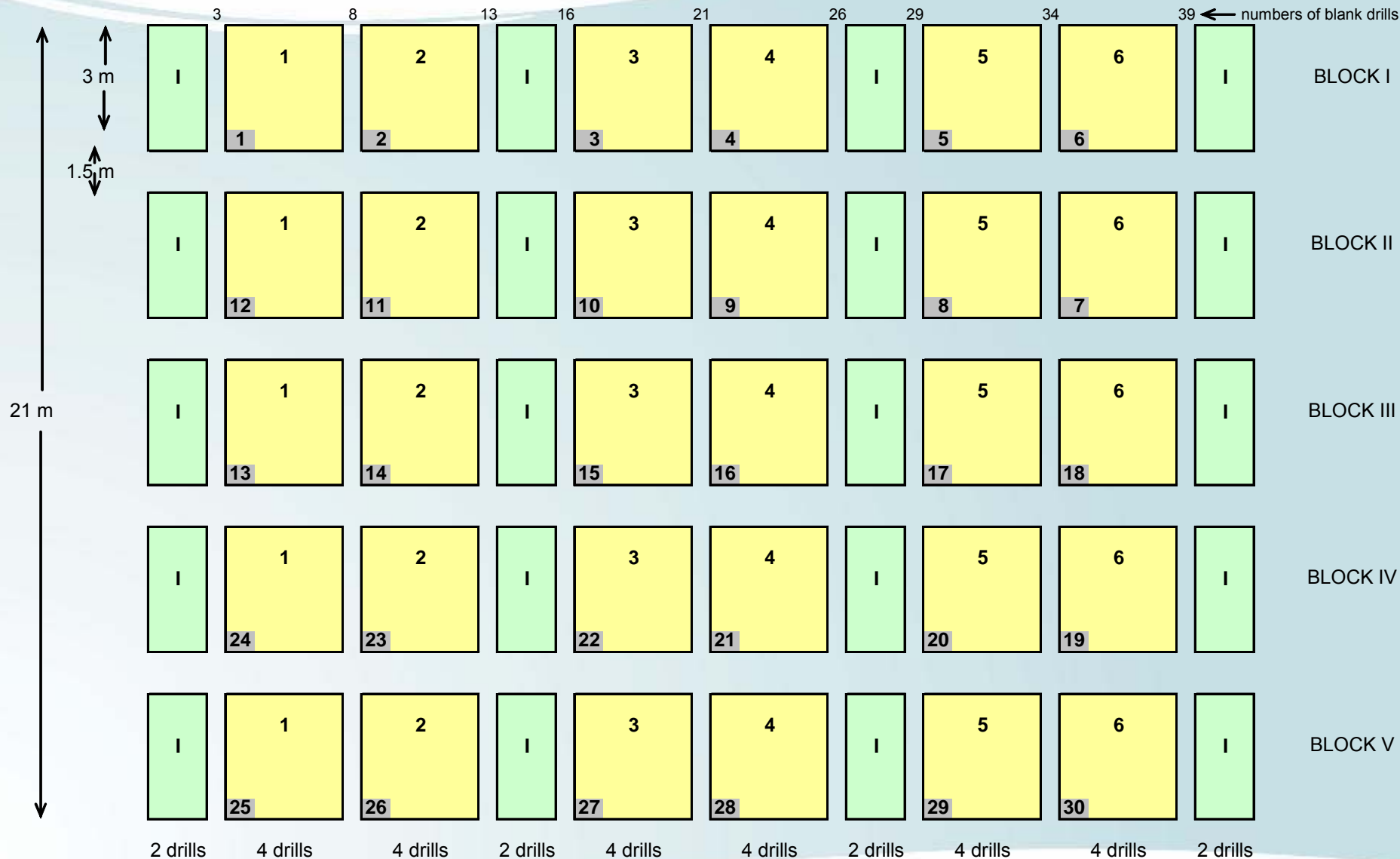
**CV. UP-TO-DATE**



Infector drills

Plot number

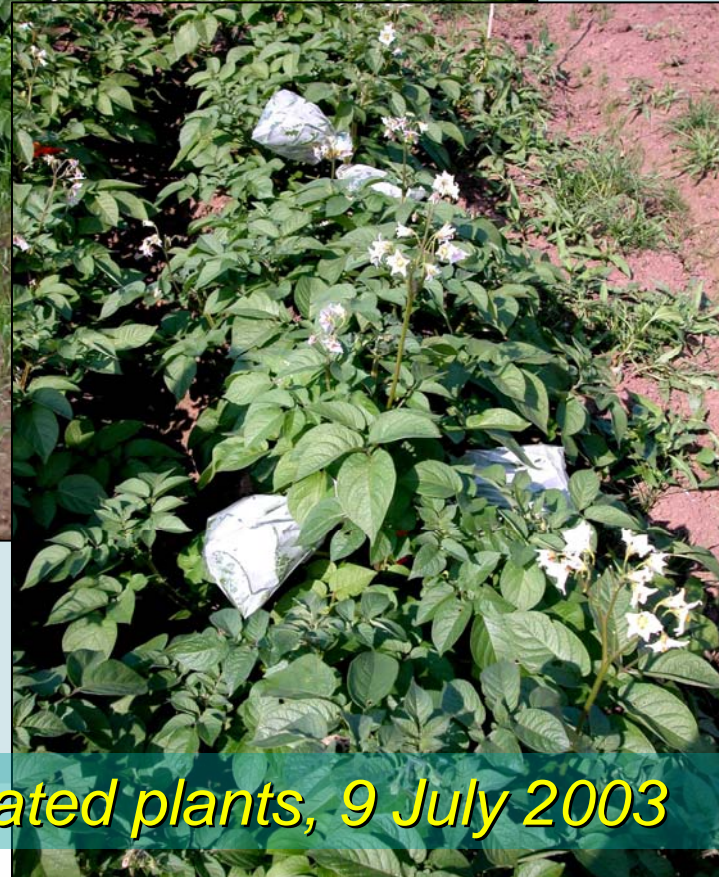
Treatment nos. (randomised within blocks)



## ***Field trials 2003-2006***

- ***Infector drills inoculated with 50/50 phenylamide-resistant/sensitive N. Ireland P. infestans isolates in early July***
- ***Mist irrigated morning and evening to encourage infection***





*Over-view of trial and close-up of inoculated plants, 9 July 2003*

## ***Field trials 2003-2006***

- ***Fungicide programmes started in mid-late June (before inoculation) and continued until desiccation***
- ***All sprays applied at 7-d intervals***
- ***Standard programme in all trials:***
  - ❖ ***2 x 'Fubol Gold' (1.9 kg/ha; 76 g metalaxyl-M + 1216 g mancozeb/ha)***
  - ❖ ***8 x 'Shirlan' (300 ml/ha; 150 g fluazinam/ha)***
- ***Plots assessed twice weekly after inoculation***
- ***Desiccation beginning of September***
- ***Harvesting late September – early October***





*View of the trial plots, 6 July 2004*





*View of the trial plots, 15 July 2004*





*Inoculated infector drills, 13 August 2004*



*Dead infector drills alongside treated plots, 29 August 2003*





# ***Field trials 2003-2006***

- ***Post-harvest assessments:***
- ***Graded yield (>35, 35-55, >55 mm tubers and soft-blighted tubers) assessed October-November***
- ***Remaining healthy tubers >35 mm stored and tuber blight assessed:***
  - ❖ ***November-December***
  - ❖ ***January-February***

# ***Field trials 2003, 2004***

- ***Standard programme:***

- ❖ ***2 x 'Fubol Gold'***  
***8 x 'Shirlan'***

- ***Compared with:***

- ❖ ***2 x 'Fubol Gold'***  
***5 x 'Shirlan'***  
***3 x 'Infinito' (1.4 l/ha; 87.5 g fluopicolide +  
875 g propamocarb/ha)***

## ***Field trials 2005, 2006***

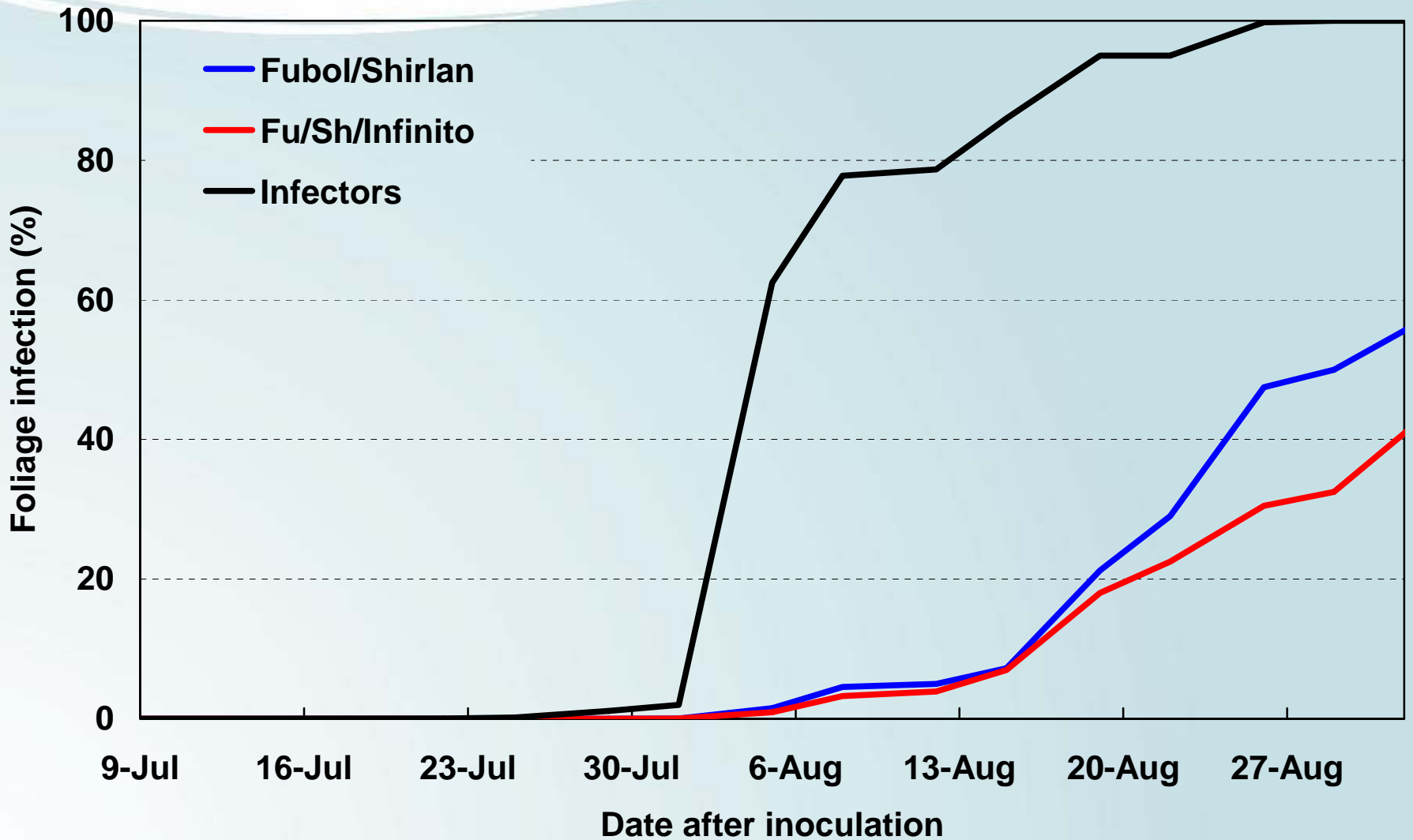
- ***Standard programme:***

- ❖ ***2 x 'Fubol Gold'***
- ❖ ***8 x 'Shirlan'***

- ***Compared with:***

- ❖ ***2 x 'Fubol Gold'***  
***2 x 'Shirlan'***  
***3 x 'Infinito' (1.6 l/ha; 100 g fluopicolide +  
1000 g propamocarb/ha)***  
***3 x 'Shirlan'***
- ❖ ***2 x 'Fubol Gold'***  
***5 x 'Shirlan'***  
***3 x 'Infinito' (1.4 l/ha; 87.5 g fluopicolide +  
875 g propamocarb/ha)***

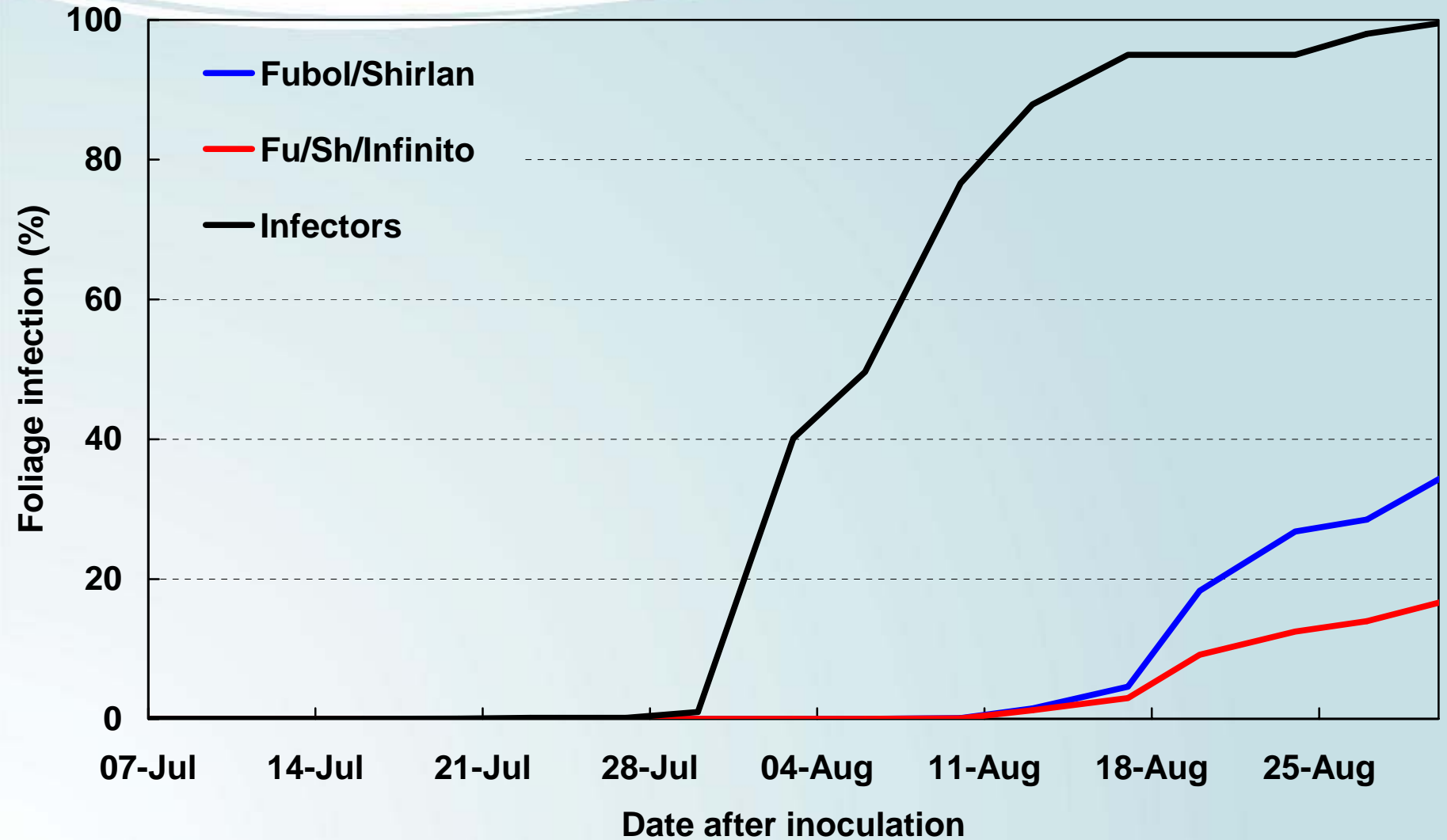
## 2003 trial: Foliage blight assessments



*The 'Infinito' programme plots had significantly less foliage blight than the standard programme at the final assessments*

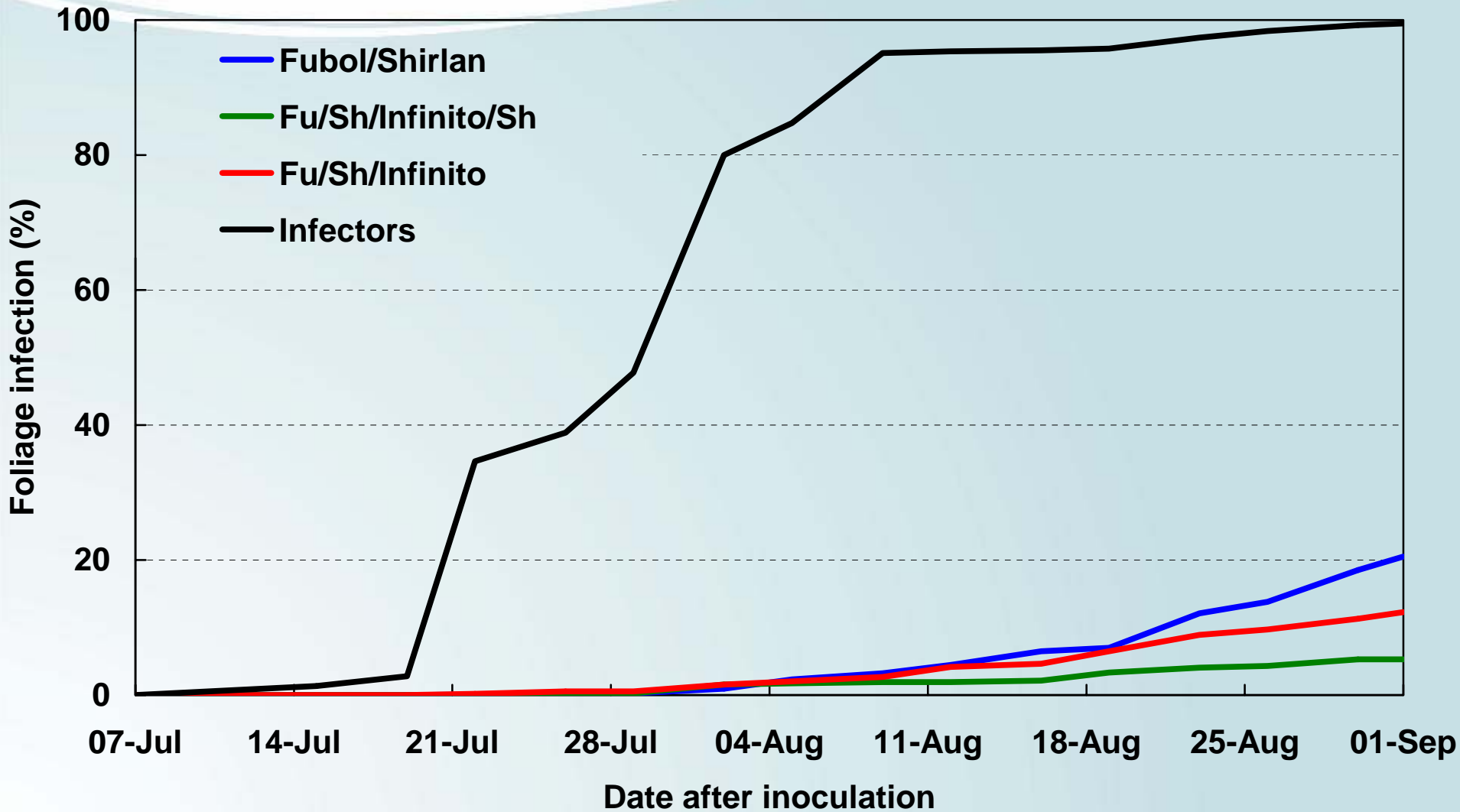


## 2004 trial: Foliage blight assessments



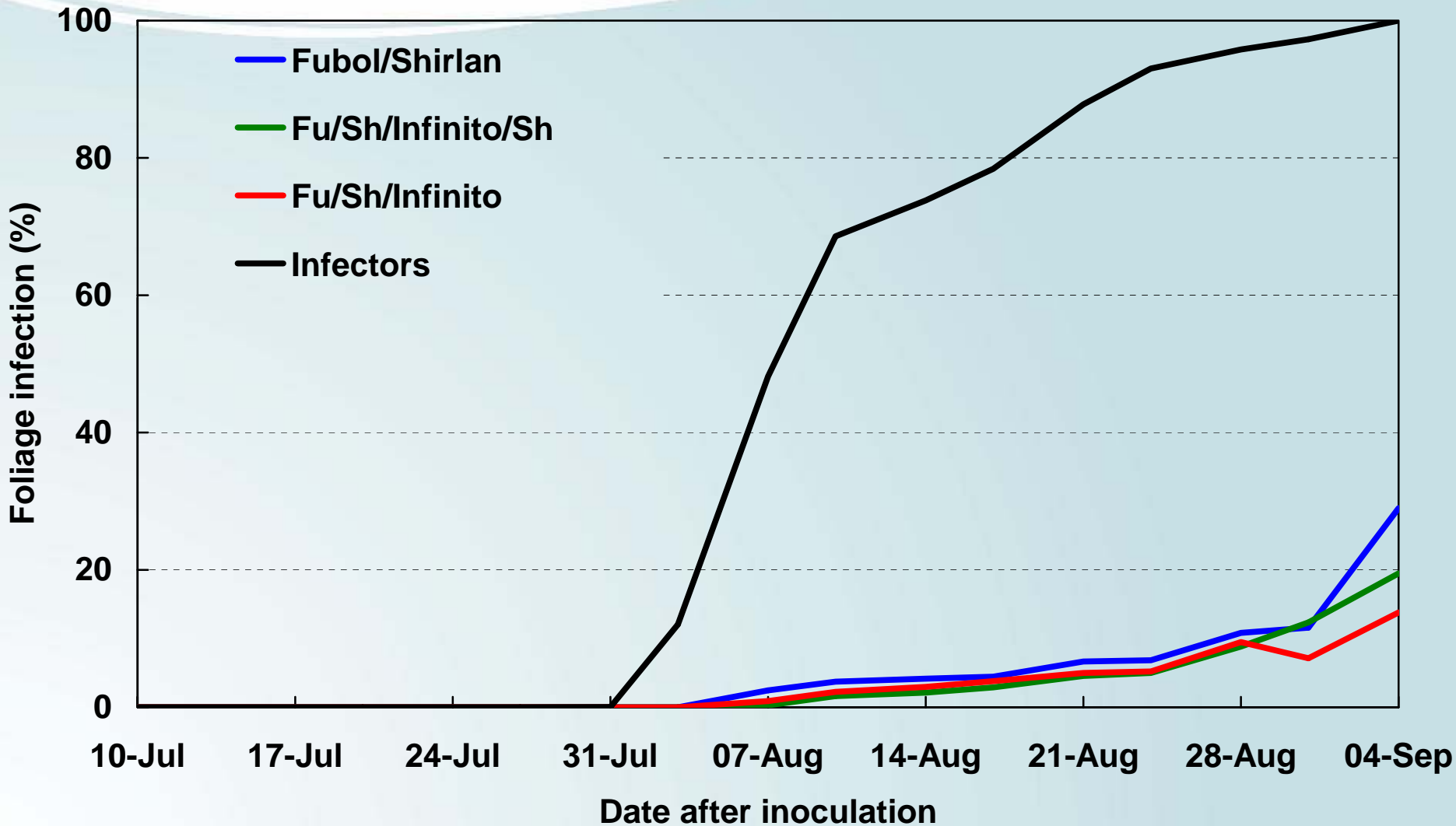
*The 'Infinito' programme plots had significantly less foliage blight than the standard programme in the later assessments*

## 2005 trial: Foliage blight assessments



*The mid-season 1.6 l/ha 'Infinito' programme resulted in significantly less foliage blight than the standard programme in the later assessments*

## 2006 trial: Foliage blight assessments



*The two 'Infinito' programmes resulted in significantly less foliage blight than the standard programme in the final assessments*





*Dead infector drills and treated plots, 14 August 2006*





*'Fubol Gold'/'Shirlan'-treated plot, 14 August 2006*

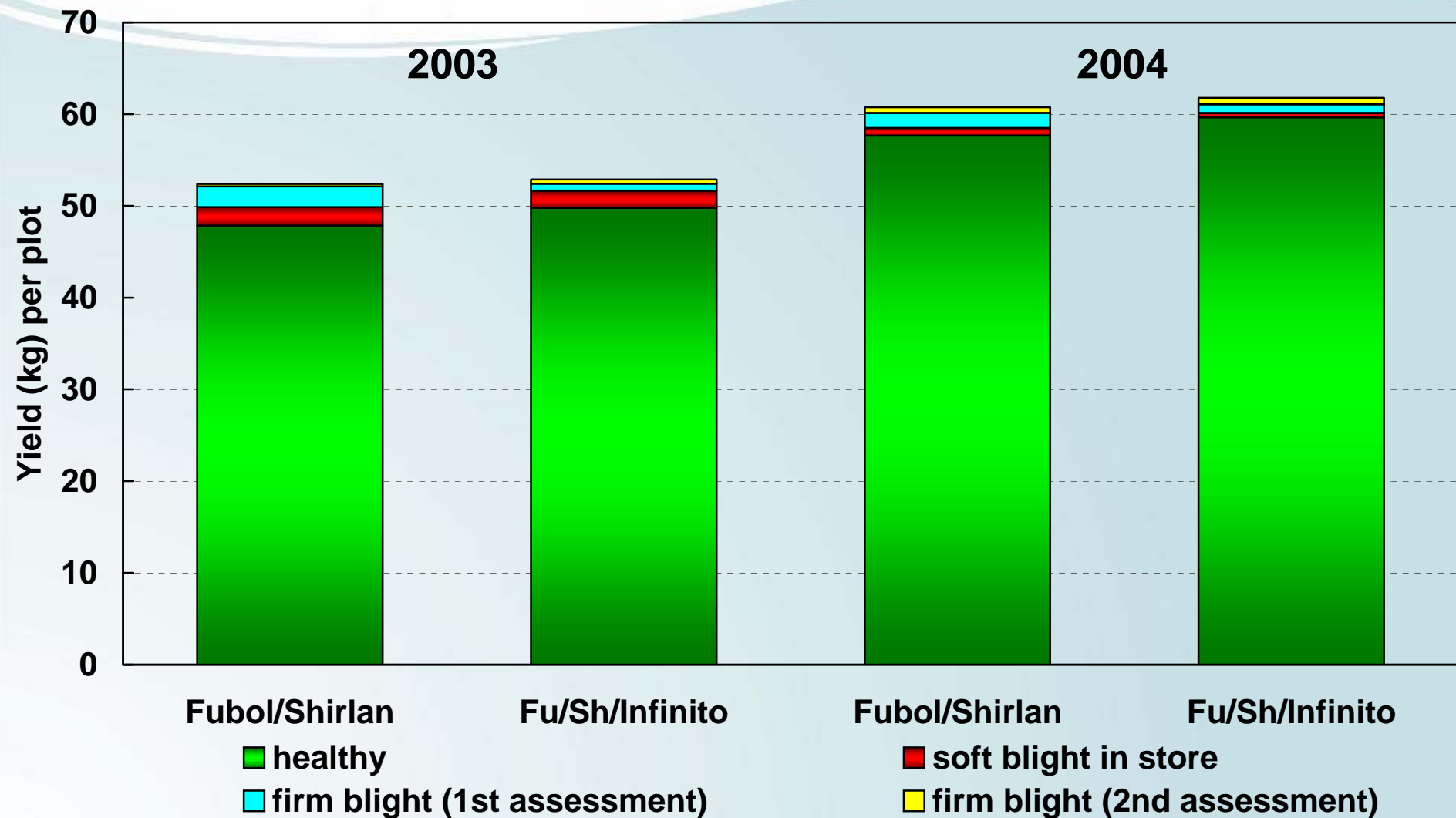




*'Fubol Gold'/'Infinito'/'Shirlan'-treated plot, 14 August 2006*

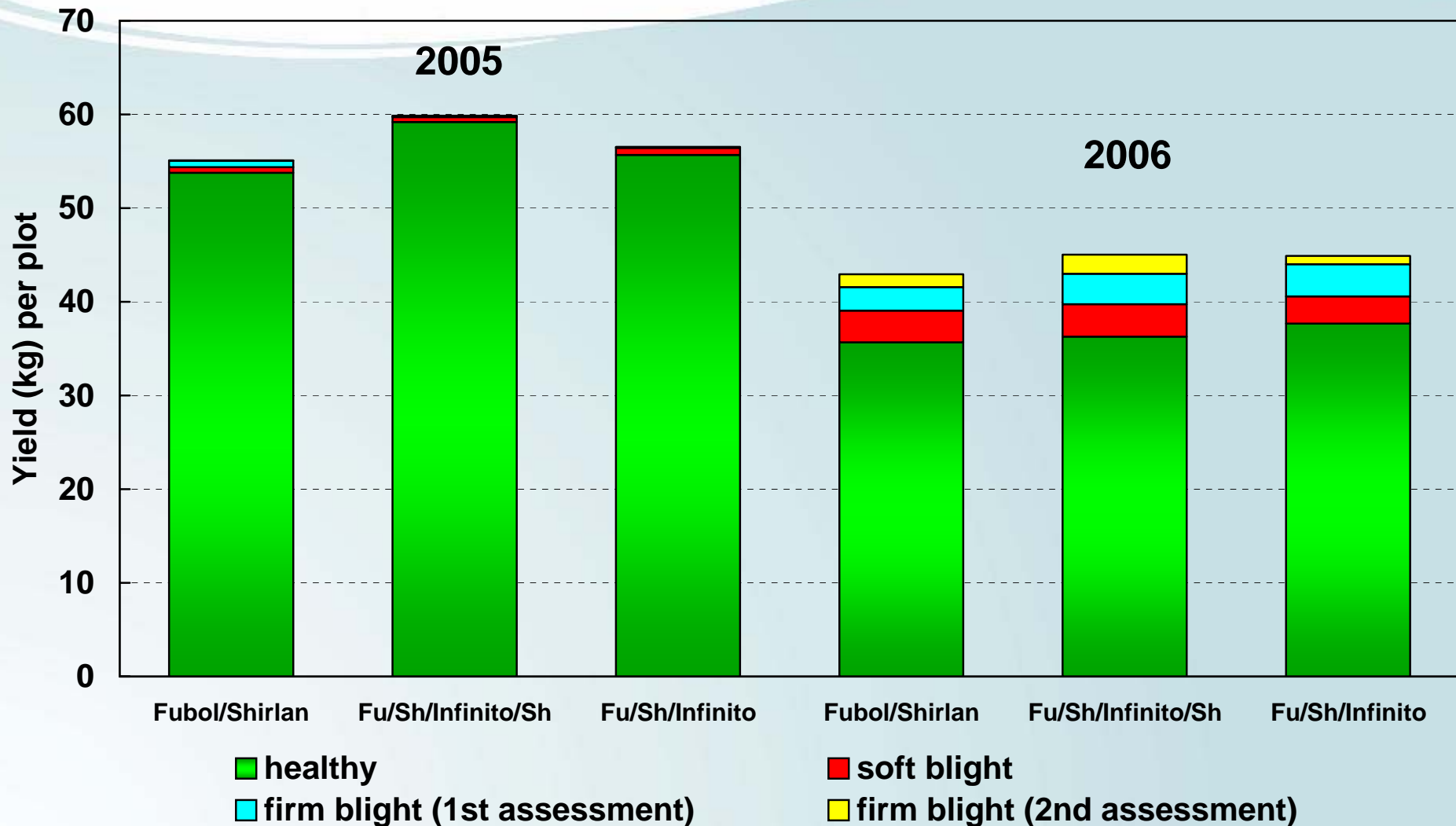


# 2003 & 2004 trials: Marketable yield assessments



*In both years, the 'Infinito' programmes resulted in a slightly greater marketable yield and a lower weight of blighted tubers than the standard programme*

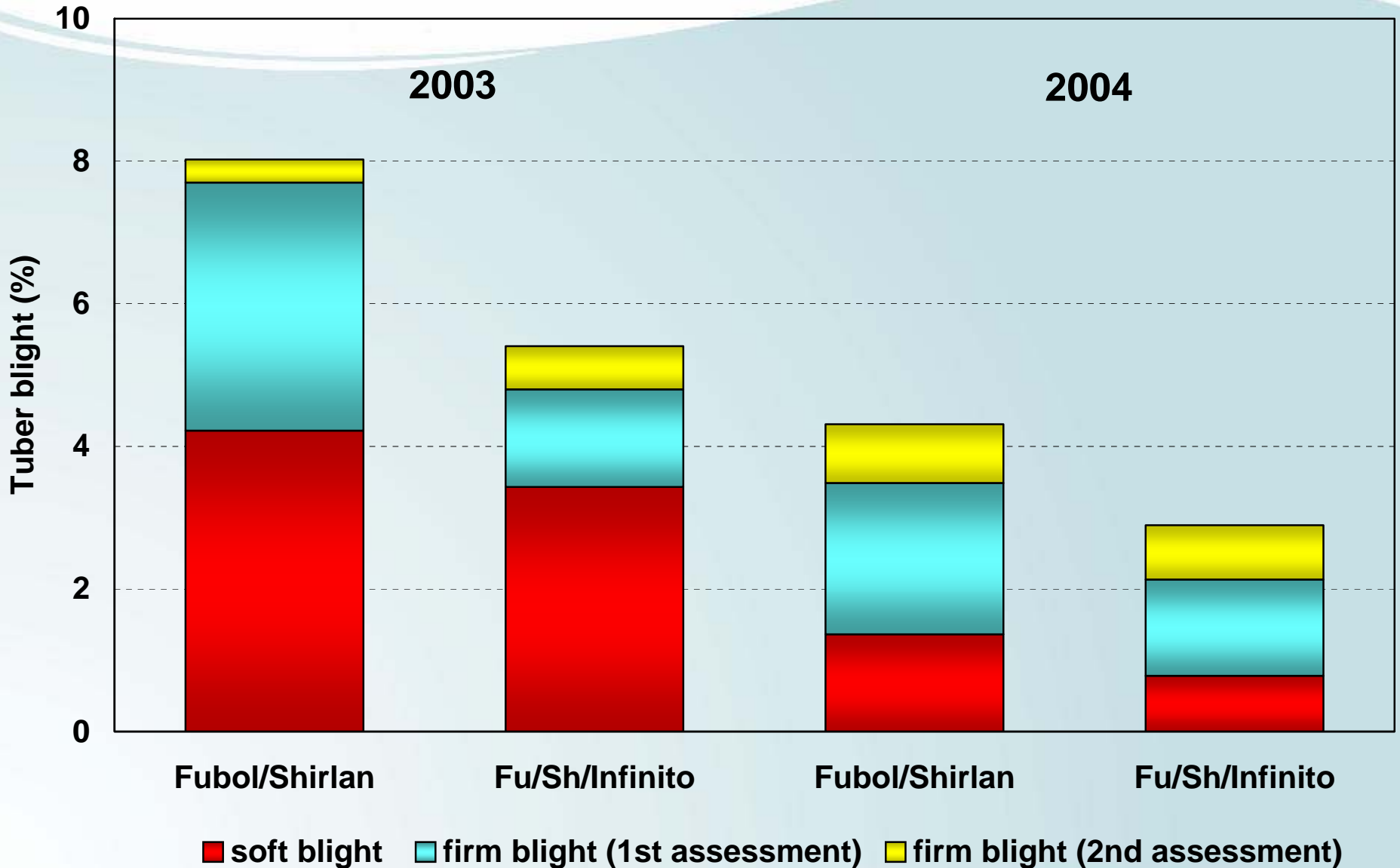
# 2005 & 2006 trials: Marketable yield assessments



*The mid-season 'Infinito' programme resulted in a greater marketable yield than the standard programme in 2005, but not 2006 when yields were much lower*

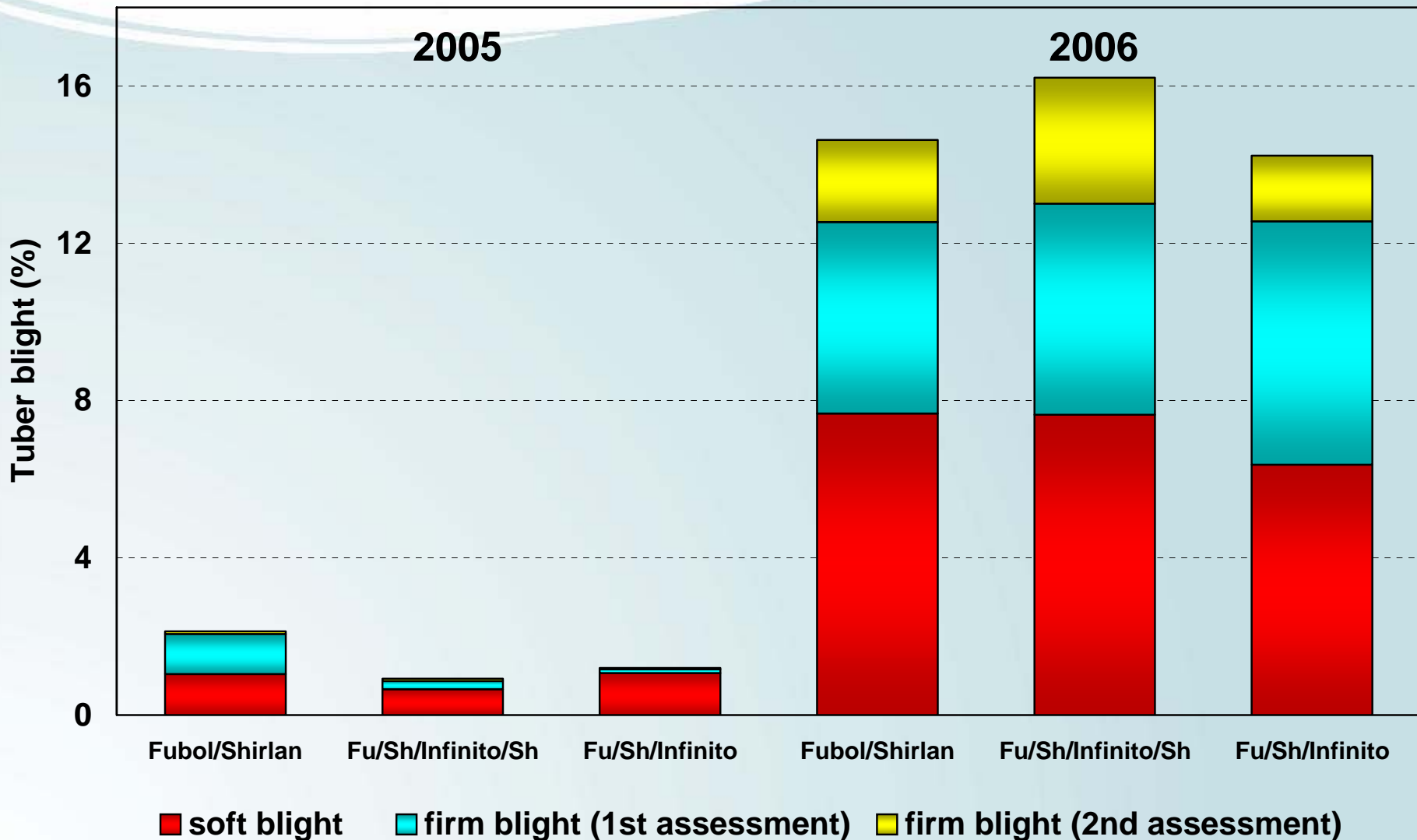


# 2003 & 2004 trials: Tuber blight assessments (% by number)



*The 'Infinito' programme resulted in a lower percentage of blighted tubers*

# 2005 & 2006 trials: Tuber blight assessments (% by number)



*The end-of-season 'Infinito' programme resulted in fewer blighted tubers than the standard in both years; the mid-season one had less blight in 2005, but not in 2006*



## **Field trials 2003-2006**

**Analysed over years, the programme ending with 'Infinito' 1.4 l/ha (the only 'Infinito' programme used every year) achieved significantly:**

- **Better foliage blight control than the standard**
- **Better tuber blight control than the standard**
- **Greater marketable yield than the standard**

<b>Treatment</b>	<b>Foliage blight (% ang. trans.)</b>	<b>AUDPC</b>	<b>Tuber blight (% ang. trans.)</b>	<b>Marketable yield (kg/plot)</b>
Fubol/Shirlan	35.4	384	14.8	48.7
Fubol/Shirlan/Infinito	25.5	256	12.9	50.3
LSD ( $P < 0.05$ )	3.98**	105.4*	1.80*	1.09*

## ***Field trials 2005-2006***

- ***Comparing the programmes:***
  - ❖ ***'Infinito' mid-season (at 1.6 l/ha)***
  - ❖ ***'Infinito' at the end of the season (at 1.4 l/ha)***
- ***'Infinito' performed better mid-season in 2005***
- ***'Infinito' performed better end-of-season in 2006***
- ***In 2006, high rainfall favouring tuber infection occurred late season***
- ***The positioning of 'Infinito' applications within the spray programme needs to take account of the seasonal timing of infection pressure***



# Conclusions

- ***In trials comparing 'Infinito' with a very robust standard programme under conditions of severe infection pressure, it consistently gave:***
  - ❖ ***superior foliage blight control***
  - ❖ ***excellent tuber blight control***
  - ❖ ***improved marketable yields***
- ***'Infinito' offers Northern Ireland growers a very useful additional weapon to combat late blight***

## ***Acknowledgements***

***This work would not have been possible without the help of:***

- ***Mark Wilson, John Saulters & AFBI field staff***
- ***QUB summer students***

