

PLANT PROTECTION INTERACTIONS WITH WEEDS

Stephen Johnson¹, Leah MacKinnon and Susan Hazlewood

(¹Dept. Primary Industries)

Introduction

Weeds may act as hosts for both insects and pathogenic organisms that have adverse impacts on cotton production. Integrated weed management practices will assist in managing these problems.

The interaction between weeds and insects has been examined in the articles [Integrated pest management guidelines for Australian cotton](#), and in particular, [Support document 4. Cotton insect pests and their weed hosts](#), both in [ENTOpak](#).

The interaction between weeds, pathogens and cotton diseases is outlined below. For more details on weeds and diseases, the reader is referred to the [Integrated Disease Management Guidelines](#). Details of all these publications are given below.

Weeds, pathogens and cotton diseases

Apart from the obvious effects of weeds on cotton production and yield, weeds may also harbour pathogenic organisms responsible for many of the diseases associated with cotton production. Weeds may act as alternative hosts for some cotton pathogens (Table 1) and enable the survival of the pathogen during the period between subsequent cotton crops. Bladder ketmia, for example, can act as an alternative host for the pathogens that cause Verticillium wilt, Fusarium wilt and Alternaria leaf spot of cotton.

The presence of a pathogen on a weed host is not always obvious and it is possible that the symptoms normally associated with the disease may not be apparent (a symptomless weed host). Sesbania pea, bladder ketmia and dwarf amaranth are known to be symptomless hosts of the Fusarium wilt pathogen.

An infected weed can also contribute to the dispersal of a plant pathogen. The burrs of noogoora burr carry the Verticillium wilt pathogen, enabling wide dispersion of the pathogen by animals or through irrigation channels, rivers and streams, and flood waters.

Similarly, volunteer cotton plants and cotton regrowth must also be considered as significant pathogen hosts in and around cotton crops. Control of volunteers and ratoon cotton is essential to prevent the further spread of disease (see [Controlling volunteer cotton](#) section F4 in [WEEDpak](#)).

Further reading

Evans, G. (1971). Influence of weed hosts on the ecology of *Verticillium dahliae* in newly cultivated areas of the Namoi Valley, New South Wales. *Annals of Applied Biology*, **67**, 169- 175.

Mensah, R., Dillon, M., Kahn, M., Tann, C. and Wilson, L. (1999). *Support document 4. Cotton insect pests and their weed hosts*. ENTOpak, Australian Cotton CRC, Narrabri.

Mensah, R. and Wilson, L. (1999). *Integrated pest management guidelines for Australian cotton*. ENTOpak, Australian Cotton CRC, Narrabri.

Integrated Disease Management Guidelines (2002). Australian Cotton CRC, Narrabri.

Acknowledgments

We would like to acknowledge the advice of Dr. Stephen Allen and Dr. David Nehl in the preparation of the weeds, pathogens and cotton diseases information and list.

Table 1. Weeds known to be hosts of cotton pathogens

WEED SPECIES		PATHOGEN			
Common Name	Scientific Name	<i>Alternaria macrospora</i>	<i>Verticillium dahliae</i>	<i>Fusarium oxysporum</i> f.sp. <i>vasinfectum</i>	Black Root Rot
Amaranth dwarf	<i>Amaranthus macrocarpus</i>		✓✓	✓✓	
Amaranth redroot	<i>Amaranthus retroflexus</i>		✓		
Anoda weed	<i>Anoda cristata</i> (m)	maybe	✓		
Bathurst burr	<i>Xanthium spinosum</i>		✓✓		
Bellvine	<i>Ipomoea plebeia</i>		*		
Bindweed Australian	<i>Convolvulus erubescens</i>		✓✓		
Bindweed black	<i>Fallopia convolvulus</i>		*		
Blackberry nightshade	<i>Solanum nigrum</i>		✓		
Bladder ketmia	<i>Hibiscus trionum</i> (m)	✓✓	✓✓	✓✓	
Burr medic	<i>Medicago polymorpha</i>		✓✓		maybe
Cobler's pegs	<i>Bidens pilosa</i>		*		
Common joyweed	<i>Alternanthera nodiflora</i>		*		
Cotton regrowth	<i>Gossypium hirsutum</i> (m)	✓	✓✓	✓✓	✓✓
Cowvine/Peachvine	<i>Ipomoea lonchophylla</i>		✓		
Dead nettle	<i>Lamium amplexicaule</i>		✓		definitely not
Dock curled	<i>Rumex crispus</i>		✓✓		
Gooseberry wild/Chinese lantern	<i>Physalis minima</i>		*		
Groundcherry perennial	<i>Physalis virginiana</i>		*		
Groundcherry/Annual ground cherry	<i>Physalis ixocarpa</i>		✓✓		
Mallow small flowered	<i>Malva parviflora</i> (m)	maybe	✓		
Malvastrum spiked	<i>Malvastrum americanum</i> (m)	maybe			
Medic	<i>Medicago</i> spp.		✓✓		maybe
Mintweed	<i>Salvia reflexa</i>		✓✓		
Noogoora burr	<i>Xanthium occidentale</i>		✓✓		
Nutgrass	<i>Cyperus rotundus</i>				definitely not
Pigweed Red	<i>Portulaca oleracea</i>		✓✓		
Purpletop	<i>Verbena bonariensis</i>		✓✓		
Saffron thistle	<i>Carthamus lanatus</i>		✓		
Sesbania pea	<i>Sesbania cannabina</i>			✓✓	
Sowthistle common/Milkthistle	<i>Sonchus oleraceus</i>				
Sunflowers volunteer	<i>Helianthis annuus</i>		✓✓		
Thornapple common	<i>Datura stramonium</i>		✓		✓✓
Thornapple fierce	<i>Datura ferox</i>		✓✓		
Tobacco wild	<i>Nicotiana</i> spp.		✓✓		maybe
Turnip weed	<i>Rapistrum rugosum</i>		✓✓		
Turnip wild	<i>Brassica</i> spp.		✓		
Variegated thistle	<i>Silybum marianum</i>		✓		
Velvetleaf	<i>Abutilon theophrasti</i> (m)		✓✓		✓✓
Verbena trailing	<i>Verbena supina</i>		*		

Key

- ✓✓ HOST – definite
- ✓ HOST – indications
- blank unknown
- * in other species of the same genera
- (m) weeds related to cotton (Malvaceae family)