
Other *Acacia* species as a source of resistance to *Ceratocystis*

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Introduction

- ***Ceratocystis acaciivora***, the causal agent of wilt, canker, and dieback on *Acacia mangium*, is currently one of the major diseases in commercial *A. mangium* plantations in Indonesia.
- *Ceratocystis* commonly infect wounds on trees (natural wounds such as wind damage, animal damage, stem borer damage; man made wounds – created during and through man activities).



Ceratocystis incidence records on Acacias

Host	Pathogen	Location	References
<i>A. decurrens</i>	<i>C. fimbriata</i>	Brazil	Ribeiro et al., 1988
<i>A. mearnsii</i> <i>A. decurrens</i>	<i>C. albifundus</i>	Uganda, South Africa	Morris et al., 1993; Roux and Wingfield, 1997; Roux et al., 1999; Wingfield et al., 1996; Roux et al. 2001
<i>Acacia mangium</i>	<i>C. inquinans</i> <i>C. mikrobasis</i> <i>C. sumatrana</i>	Indonesia	Tarigan et al. 2010
<i>Acacia mangium</i> , <i>Acacia crassicarpa</i>	<i>C. acaciivora</i> <i>C. manginecans</i>	Indonesia	Tarigan et al. 2011

Management

- Avoid un-necessary wound through all our operational activities.
- Plant tolerant/resistance materials.
- Develop effective bio-control agents: endophytic *Trichoderma* (ETA) and endophytic bacteria (EBA) that were isolated from AM stands, some of which were surviving plants in *Ceratocystis* affected areas.
- Improve plant vigor and reduce plant stress through good silviculture practice



Aim

- Use of resistant genotypes is considered the most feasible control method in most plantation forests.
 - Unfortunately, data on resistance in *Acacia* species to this pathogen are not sufficiently available
 - The aim of this study was to identify resistance sources in different *Acacia* species including *A. mangium*, *A. auriculiformis*, *A. crassicarpa*, *A. aulalocarpa* and hybrid of *A. mangium* x *A. auriculiformis* to *Acacia* wilt caused by *C. acaciivora*.
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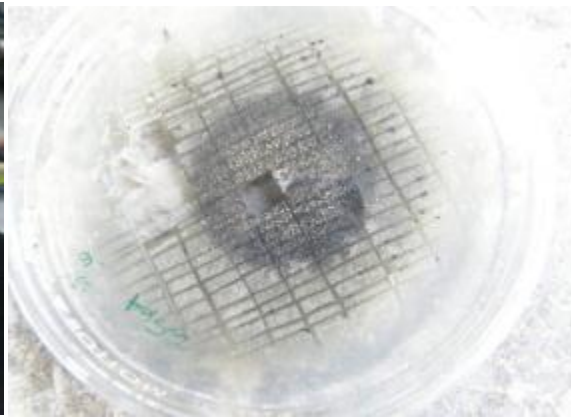


Method

- The most virulent isolate collected from previous studies was used to inoculate container-grown, 12-week-old rooted cuttings of each *Acacia* species. Prior to inoculation, wounds (2 x 3 mm) were made on the stems of the rooted cutting using a laboratory blade and an agar disc taken from an actively growing colony on 2% MEA, with the mycelium facing downwards, was placed in the wound, then covered with Parafilm. For control, plants were inoculated with sterile MEA plugs. The plants were evaluated weekly for 30 days for length of xylem discoloration, plant wilting and mortality.
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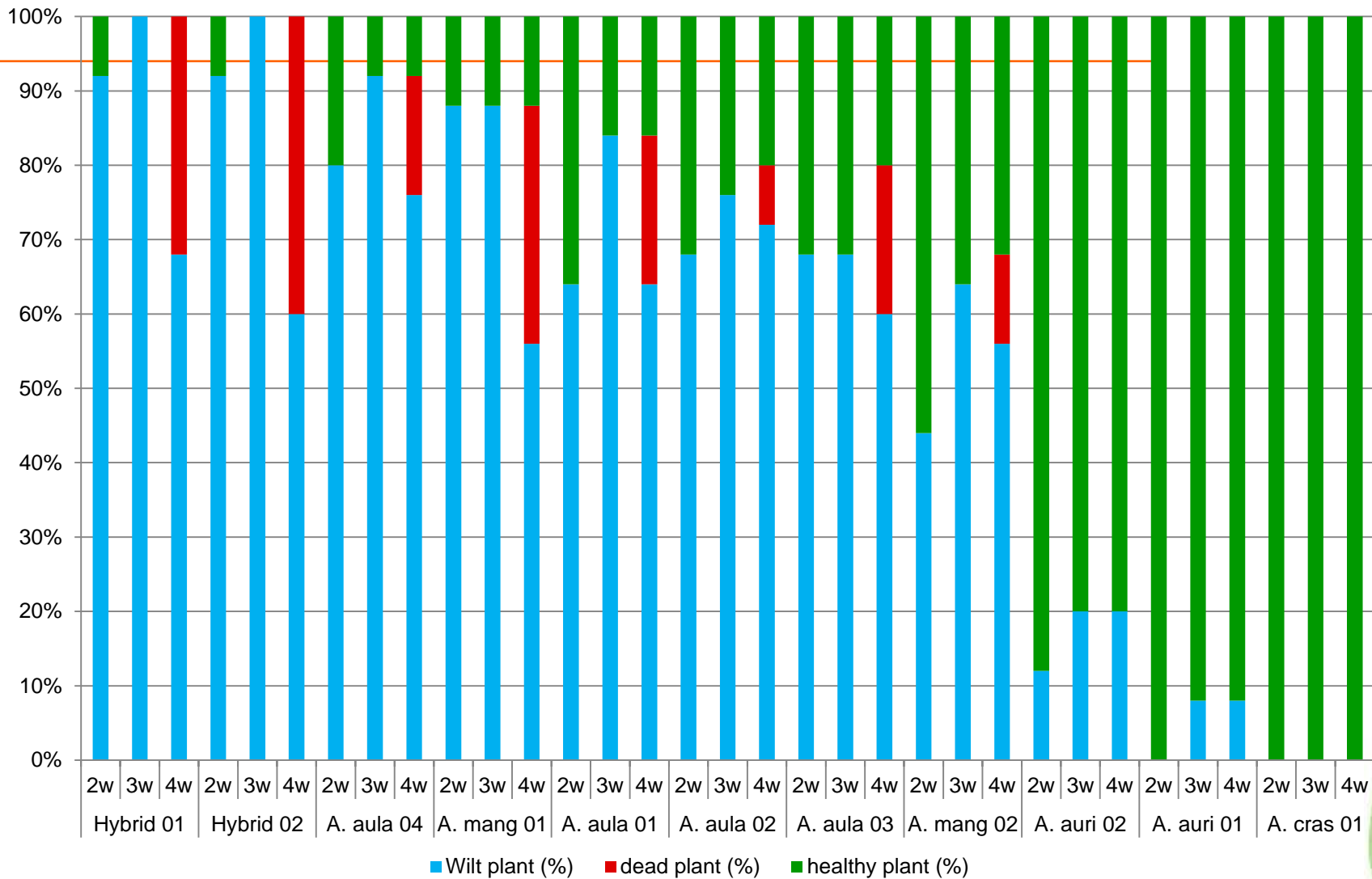
Nursery Inoculation using Lab-Blade method



Symptoms



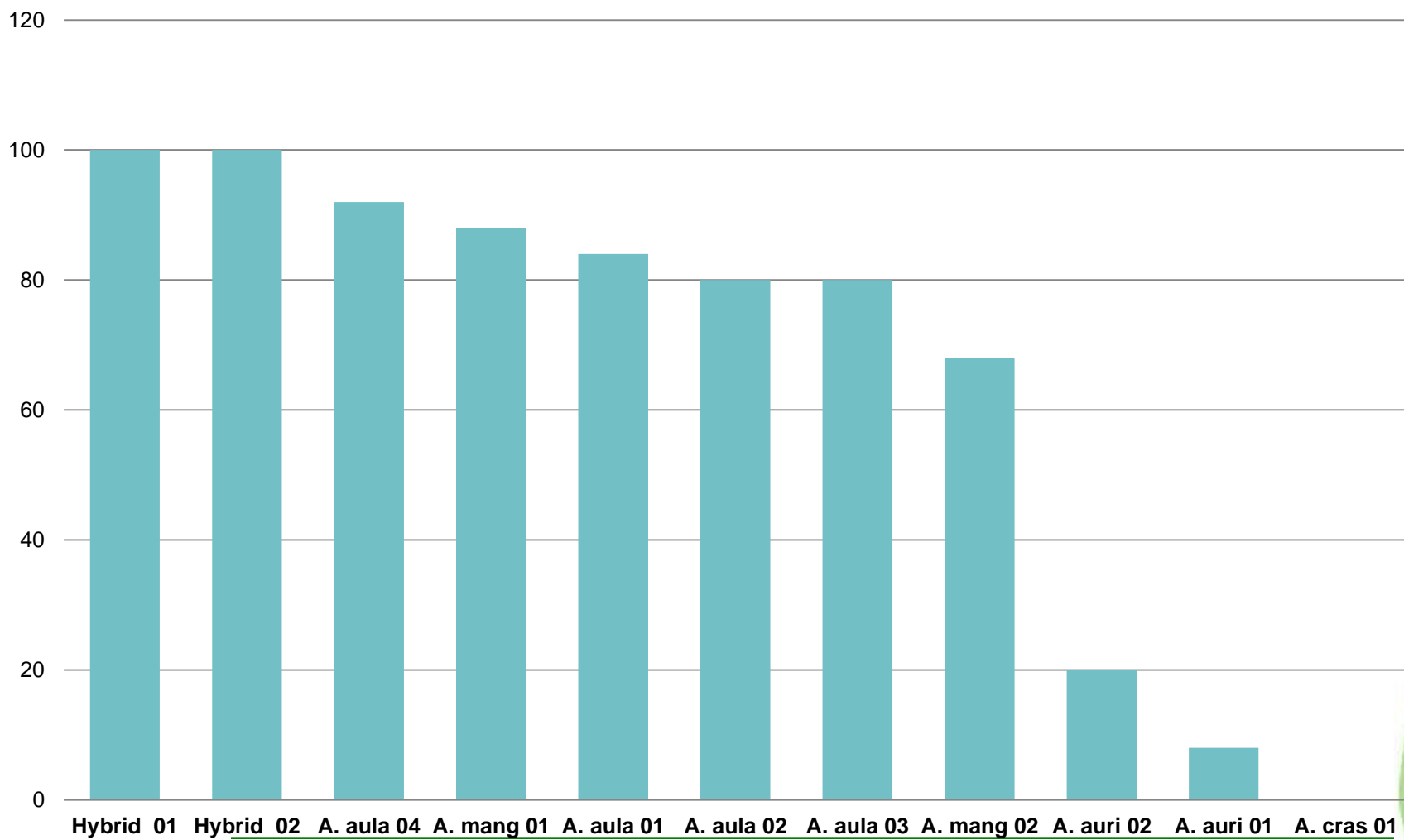
Graph *Ceratocystis* infection at 2 , 3, 4 weeks



Results

Treat	Age (WAI) Mean std dev f prob	Infected plant (%)								
		2			3			4		
		mean	std	dun	mean	std	dun	mean	std	dun
Hybrid 01	55,3 38,7 0,000	92,0	11,0	a	100,0	0,0	a	100,0	0,0	a
Hybrid 02		92,0	17,9	a	100,0	0,0	a	100,0	0,0	a
<i>A. aula</i> 04		80,0	20,0	ab	92,0	17,9	ab	92,0	17,9	a
<i>A. mang</i> 01		88,0	17,9	ab	88,0	17,9	abc	88,0	17,9	ab
<i>A. aula</i> 01		64,0	29,7	bc	84,0	16,7	abcd	84,0	16,7	ab
<i>A. aula</i> 02		68,0	33,5	abc	76,0	26,1	bcd	80,0	20,0	ab
<i>A. aulo</i> 03		68,0	17,9	abc	68,0	17,9	cd	80,0	14,1	ab
<i>A. mang</i> 02		44,0	16,7	c	64,0	21,9	d	68,0	26,8	b
<i>A. auri</i> 02		12,0	17,9	d	20,0	24,5	e	20,0	24,5	c
<i>A. auri</i> 01		0,0	0,0	d	8,0	11,0	e	8,0	11,0	c
<i>A. cras</i> 01		0,0	0,0	d	0,0	0,0	e	0,0	0,0	c

Incidence at 4 WAI



Results & conclusion

- Wilting symptom started to appear 2 weeks after inoculation in all species except *A. crassicarpa* and *A. auriculiformis*.
- In first 2 weeks most of the Acacia species showing more than 50% infection.
- Based on this study, it is obvious that among the different *Acacia* species tested, *A. crassicarpa* and *A. auriculiformis* are promising sources of resistance.



THANK YOU

