Growth Variations in the Clonal Test of *Acacia* hybrid at Segamat (Johor) and Bintulu (Sarawak), Malaysia

Nor-Fadilah W[1]., Mohd-Zaki A[1]., Farah-Fazwa M.A[1]., Norwati M[1]. & Wickneswari, R[2].

[1]Forest Research Institute Malaysia (FRIM), Kepong 52109, Selangor, Malaysia
[2]School of Environmental and Natural Resource Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

norfadilah@frim.gov.my

INTRODUCTION

- The desirable characteristics of *Acacia* hybrid make it a viable candidate for forest plantations. However in Malaysia there is very little information on *A.* hybrid clones, making *A. mangium* more preferable among the industrial planters. Therefore, this study was initiated to develop clones of *A.* hybrid for future uses in commercial forest plantation programmes.
- In this project, *A.* hybrid was produced via a controlled pollination technique using two parent trees from *A. mangium* and *A. auriculiformis*. Selection of the parents trees were made based on the wood properties (fiber length and wood density).
- Assessment of the growth traits (height and diameter at breast height) at the age of four and five years old showed significant variations among the 329 clones tested. There are four high-performing clones of *A.* hybrid namely **F104, F175, F176** and **F177**. These clones have shown promise based on their growth performances and the stability of the clones across two locations. The identified clones have the potential to become ideal candidates for future forest plantation programmes.

OBJECTIVES

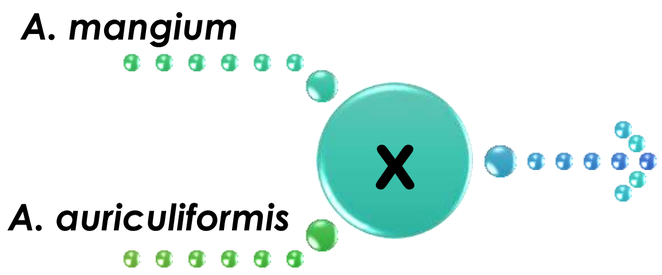
- To develop clones of *A.* hybrid
- To assess the variations on the growth performances among the *A.* hybrid clones' grown at two different sites.

RESEARCH OUTPUT

- There are four potential high-performing clones of *A.* hybrid were identified namely F104, F175, F176 and F177.

METHODOLOGY

Selection of the parents trees were made based on the wood properties (fiber length and wood density).



2002

- Hybridization via controlled pollination technique
- Hybrid seeds

2004

- Seedlings verification using allozyme marker
  *(selfed-seedlings were discarded)
- Mass propagation via tissue culture

2009 & 2012

- Establishment of clonal trial plots at Segamat, Johor and Bintulu, Sarawak
- Growth data collections and plots maintenance

RESULTS AND DISCUSSION

Clonal trial plot of *A.* hybrid at Segamat, Johor and data collection activities (HT and DBH).

Table 1: ANOVA Tests for Clones Comparison

Dependent Variable		Sum of Squares	df	Mean Square	F	Sig.
DBH (cm) at 4 years	Contrast	7082.076	328	21.592	2.707	.000
	Error	21642.258	2713	7.977		
HT (m) at 4 years	Contrast	4463.696	328	13.609	2.799	.000
	Error	13192.348	2713	4.863		
DBH (cm) at 5 years	Contrast	14161.886	328	43.176	3.071	.000
	Error	38139.200	2713	14.058		
HT (m) at 5 years	Contrast	19833.614	328	60.468	5.031	.000
	Error	32611.132	2713	12.020		

Table 2: Selected Clones based on growth performances and phenotypic assessment

No.	Clones	DBH (cm)	HT (m)	MAI of DBH (cm^{-1})	MAI of HT (m^{-1})	Straightness	Forking
1.	F104	25.45	22.40	5.09	4.48	3	4
2.	F176	24.54	27.93	4.91	5.59	3	4
3.	F177	23.45	24.62	4.69	4.92	2	3
4.	F175	23.05	25.75	4.61	5.15	3	4

CONCLUSION AND RECOMMENDATIONS

- Assessment of the growth performances showed significant variations among the 329 clones tested. There are four high-performing clones of *A.* hybrid namely F104, F175, F176 and F177.
- There were significant variations between the two sites and interaction between the sites and clones.
- In general, growth performances of *A.* hybrid at Bintulu showed better performance than *A.* hybrid grown at Segamat.
- Considering wilt disease caused by *Ceratocystis* is an imminent threat, *A.* hybrid clones with resistant/tolerance towards the disease are important to be developed.