

# SHORT OR LONG PLANTATION ROTATION? ANALYSIS OF ECONOMIC EFFICIENCY OF ACACIA TIMBER PRODUCTION IN VIETNAM

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## **Background and objectives**

- Plantation forests for sustaining material supply for Vietnamese wood-based sector.
- Smallholders manage about half of plantation area, Acacia hybrids being the most popular.
- Up to 80% of plantation wood is for low-value woodchip production.
- Vietnamese government introduced policies, e.g. land tenure or long rotation timber plantation promotion



### **Materials and methods**

- Case study: Quang Tri province, central Vietnam (selected 3 districts Cam Lo, Gio Linh and Vinh Linh)
- Interviewed 315 household heads, following a stratified random sampling approach.
- Selected 24 standard plots (3 plots/plantation age).
- Data analysis: Cost Benefit Analysis (CBA),

Elucidate economic efficiency of different Acacia hybrid timber plantation models, rotation ranging from 5 years to 12 years.

#### Faustmann model.

Validated the findings in group discussions and expert interviews.

# Results

Tab.1. Growth of Acacia hybrid plantations, 5 – 12 years rotation

Indicators	Age (years)								
indicators -	5	6	7	8	9	10	11	12	
Diameter at Breast Height	12.9	13.4	13.9	16.9	17.7	18.4	19.2	24.5	
(DBH) (cm) Total height (m)	8.2	8.8	9.4	10.9	11.6	12.5	13.3	14.6	
Wood volume (m <sup>3</sup> /ha)	113.0	131.3	150.3	171.4	200.5	232.8	268.5	289.3	
Average wood									



volume/year	22.6	21.9	21.5	21.4	22.3	23.3	24.4	24.1
(m <sup>3</sup> /ha/year)								



Diameter, total height and wood volume shown an increasing trend

# Tab.2. Economic efficiency of different Acacia hybrid timber plantation models, 5 - 12 years rotation

Indicators	Rotation (years)									
marcatore	5	6	7	8	9	10	11	12		
NPV	1124.45	1180.13	1306.51	1455.65	2453.57	2762.02	2907.75	2768.58		
BCR	2.41	2.36	2.35	2.49	3.51	3.81	3.96	3.89		
IRR	46%	39%	35%	33%	43%	38%	33%	30%		
AEV	311.93	279.86	292.24	372.03	478.00	530.43	567.16	533.30		

#### Fig.1. Increase of wood volume over years, 5 - 12 years rotation (m<sup>3</sup>/ha)

- Wood volume increased sharply from year 5 to year 11
- From the year 12, the growth of wood volume decreased
  - 11 years rotation plantation model indicated the highest benefit cost ration (3.96).
  - Increase in NPV as the length of the plantation rotation increased from 5 years (1124 USD/ha) to 11 years (2919 USD/ha).
  - Reduction of NPV was recorded at the 12 years rotation plantation model (2769 USD/ha).
  - A same trend was observed with BCR, IRR and AEV.

### Conclusions

Acacia hybrid production was financially profitable for timber producers Economic efficiency indicators increased from year 5 to year 11. Reduction was recorded at year 12.

• Producers' behaviors should be put in larger context to clarify profoundly their characteristics, activities and performances.

Roles of the government, supporting organizations and industry sectors.