

Labor-saving Weed Management Tools for Lowland Rice: Comparing the Use of a Pre-emergence Herbicide, Rotary Weeders and Hand Weeding



Introduction



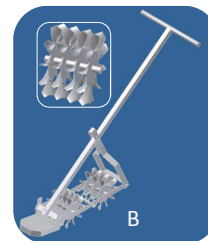
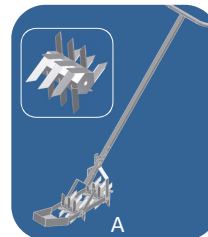
- Weeds: important yield reducing factor in rice in sub-Saharan Africa (SSA)
- Total annual production losses: 2.2 Mt
- Annual economic impact: 1.5 billion USD
- Hand weeding: 30-70% (250-780 man hour ha⁻¹) of total labor demand
- Weeding 1 ha: walking 10 km head down
- Labor-saving weed management technologies are a necessity
- Rotary weeders and herbicides
- Time gains never comparatively quantified



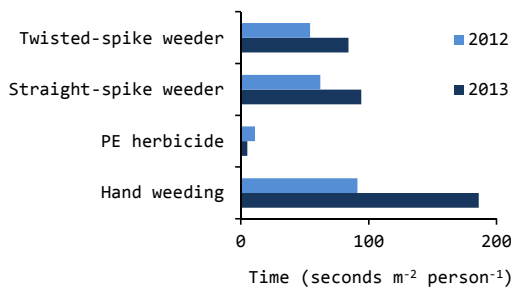
Materials & Methods



- Bagamoyo, Tanzania
- RCBD, 4 replicates, 2 seasons
- Plot size: 6 × 8 m
- Treatments:
 1. Hand weeding at 21, 42 DAT
 2. Straight spike floating weeder (A) at 21, 42 DAT
 3. Twisted spike floating weeder (B) at 21, 42 DAT
 4. Pre-emergence herbicide (Oxadiazon: *Ronstar*) at 4 DAT, hand weeding at 42 DAT
- Rotary weeding between rows followed by hand weeding in rows
- Data: Weed management time; weed biomass and rice yields



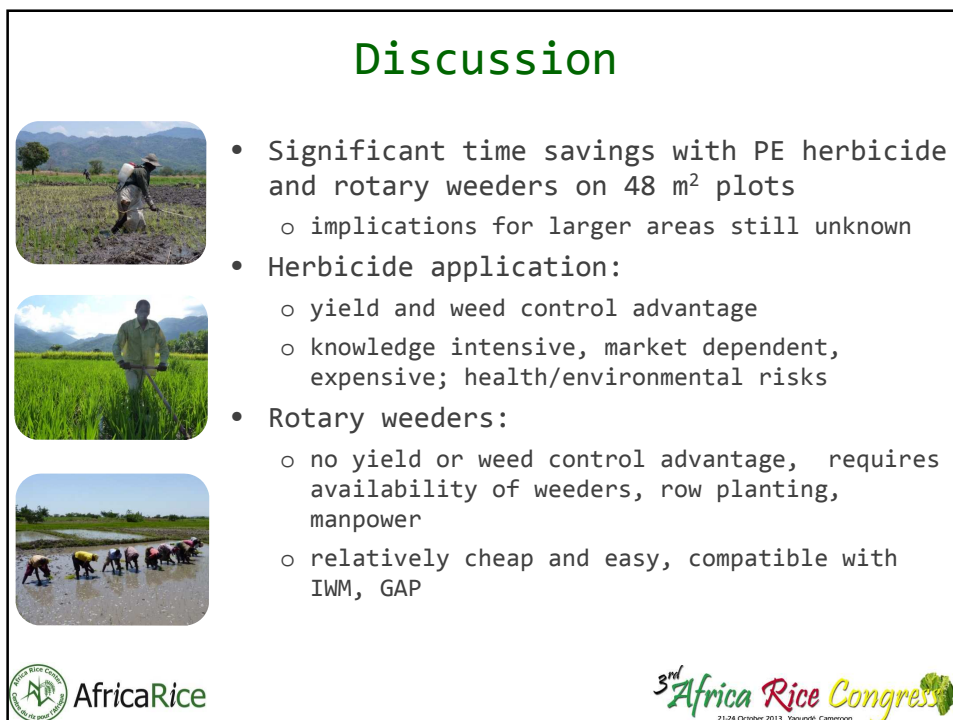
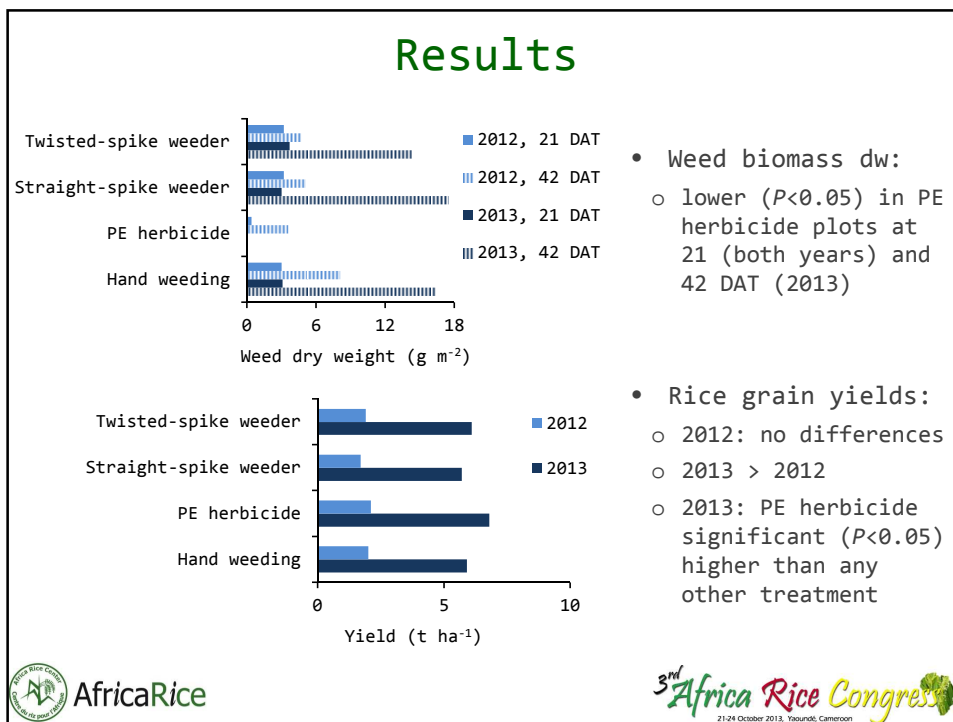
Results



	Time savings compared to hand weeding (%)	
	2012	2013
Twisted-spike weeder	40	56
Straight-spike weeder	32	49
PE herbicide	88	97

- Significant ($P < 0.001$) time reductions observed with the rotary weeders and herbicide application compared to hand weeding
- Time savings: 32-56% (weeders), 88-97% (herbicide)





Conclusions



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- Correct use of herbicides can reduce farmers' time for weed management
- Rotary weeders: more time- and manpower-demanding than herbicides, but reduce weeding time by at least a third compared to hand weeding
- Differences between weeders, hence they should be locally adapted
- In the long run rotary weeders are more cost-effective, environmentally benign than herbicides
- Suitable component technology for resource-poor rice farmers in SSA

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Way forward



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- Agronomy
 - studying yield advantages, long-term effects
 - participatory on-farm rotary weeder tests in 11 countries
- Mechanization
 - local adjustments
 - motorized rotary weeder
 - (more) blacksmith training workshops
- Social science
 - impact on gender relations
- Economics
 - economic analyses of weed management options
- Phytopathology
 - effects of on disease spread

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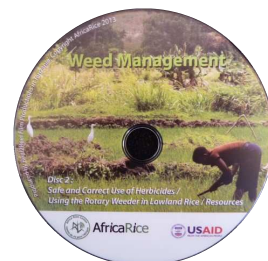
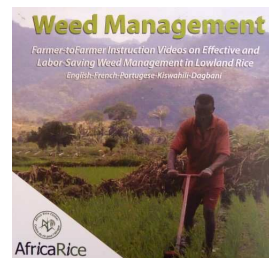
Farmer-to-Farmer Instruction Videos on Effective and Labor-Saving Weed Management in Lowland Rice

- 4 multi-language videos:
 - Effective weed management
 - Rice transplanting
 - Safe and correct use of herbicides
 - Using the rotary weeder in lowland rice
- Technical drawings of rotary weeders and line-makers
- Farmer training modules on Integrated Rice Management (PLAR-IRM)

Copies available at the AfricaRice booth (this conference)



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Thank you - Merci - Na som djita
Hartelijk dank
மிகவும் நன்றி - ご静聴ありがとうございました

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