PARASITE – a research program to support the African rice sector in dealing with parasitic weeds

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PARASITE program

- Preparing African Rice Farmers Against Parasitic Weeds in a Changing Environment
- Integrated programme NWO-WOTRO
- Wageningen University, AfricaRice and NARS of Tanzania, Benin, Cote d'Ivoire
- 3 PhD-projects, 1 postdoc project (2011-2017)
- *Striga* spp. in rain-fed upland and *Rhamphicarpa fistulosa* in rain-fed lowland rice production systems

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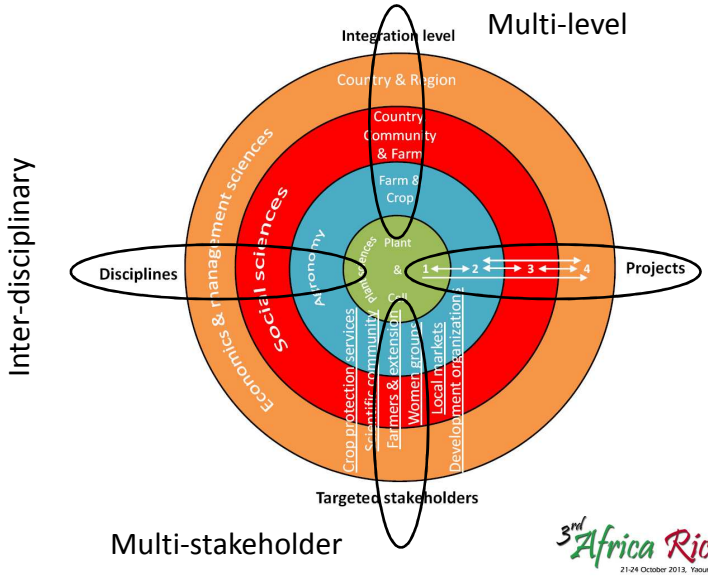
PARASITE framework



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Project ambitions

Develop control and prevention strategies, and institutional innovations to effectively address parasitic weeds in rain-fed rice farming in SSA in a changing environment

- Sub-project 1: Environmental effects (driven by climate change) on parasitic weed success and host interactions
- Sub-project 2: Cost-effective and culturally and socially acceptable parasitic weed management strategies
- Sub-project 3: Direct and (in)direct economic losses/ costs caused by parasitic weeds
- Sub-project 4: Institutional innovations to enhance capacity to respond to crop protection problems

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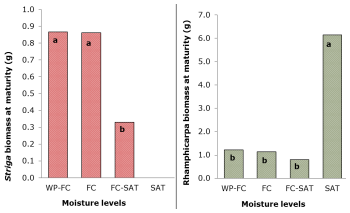
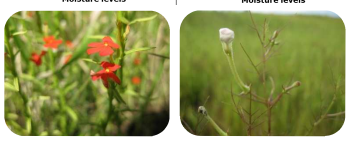
Sub-project 1: Biology and Ecology

- Objective: insights in how environmental conditions determine the presence and success of parasitic weeds
- Methods: greenhouse and field observations
- Key preliminary findings:
  - *Striga* and *Rhamphicarpa* have clearly distinct ecological niches
  - In contrast with the obligate parasite *Striga*, the facultative *Rhamphicarpa* does not require host stimulants for germination
  - Attachment to host results in considerable growth improvement and increased seed production of *Rhamphicarpa*





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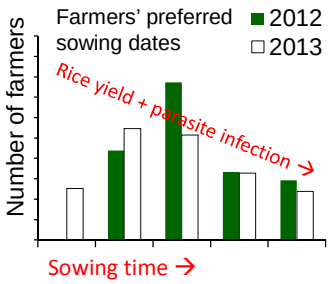
Sub-project 2: Agronomy

- Objective: develop locally adaptable and socially and economically acceptable management strategies for prevention and control of parasitic weeds in rain-fed rice
- Methods: Farmer surveys, on-farm field and demonstration trials
- Key preliminary findings:
  - Rice husks may be a suitable alternative soil fertility amendment in parasitic weed infested rice fields
  - Successful reproduction of parasitic weeds relies on optimal synchronization with the host plant: timing as a potential control strategy
  - Farmers are risk aversive: compromise between rice yield and weed control



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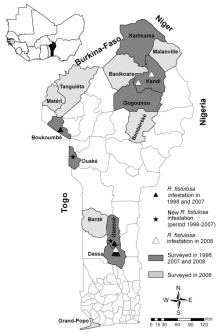
Sub-project 3: Economy

- Objective: assess current and future socio-economic impacts of parasitic weeds in rice
- Methods: Socio-economic surveys and econometric modelling
- Key preliminary findings:
  - Likelihood of *Rhamphicarpa* infestation: higher on soils with poor fertility and in fields that are located in the valley bottom
  - Severity of infestation: higher in crops managed by female-headed households, lower following late sowing, timely application of post-emergence herbicide, use of frequent weeding, medium-rate fertilizer application and prolonged fallow
  - *Rhamphicarpa* control requires awareness raising and reaching out to women



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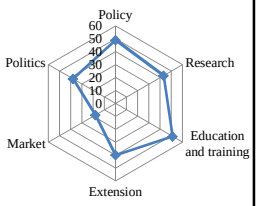
Sub-project 4: Sociology

- Objective: Contribute to institutional innovations to enhance prevention/ control of parasitic weeds
- Methods: Rapid Appraisal of Agricultural Innovation Systems (RAAIS) in Tanzania and Benin
- Key-preliminary findings:
  - Understanding non-technological dimensions of crop protection is essential for developing effective parasitic weed strategies
  - Little attention for parasitic weeds in rice in research, education and extension
  - Limited access to and quality of agricultural inputs and advisory services
  - Crop protection services focus on pest and disease control, not on weed prevention which is essential for addressing parasitic weeds



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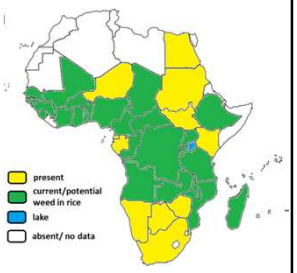
Lessons learned and way forward

- Parasitic weed problems in rice much bigger than initially anticipated
- Integrated research approach valuable; e.g. control strategies are evaluated at pot, field and farm level, whereas innovation system analysis identifies conditions for the broader (locally adapted) dissemination of control strategies
- Suitability and affordability of high potential parasitic weed management strategies will be tested with farmers
- For each of the project countries, strategies for tailor-made action-oriented R4D activities will be developed in collaboration with key-actors and stakeholders



Rhamphicarpa in Africa

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Thank you - *Merci*

Project partners:

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