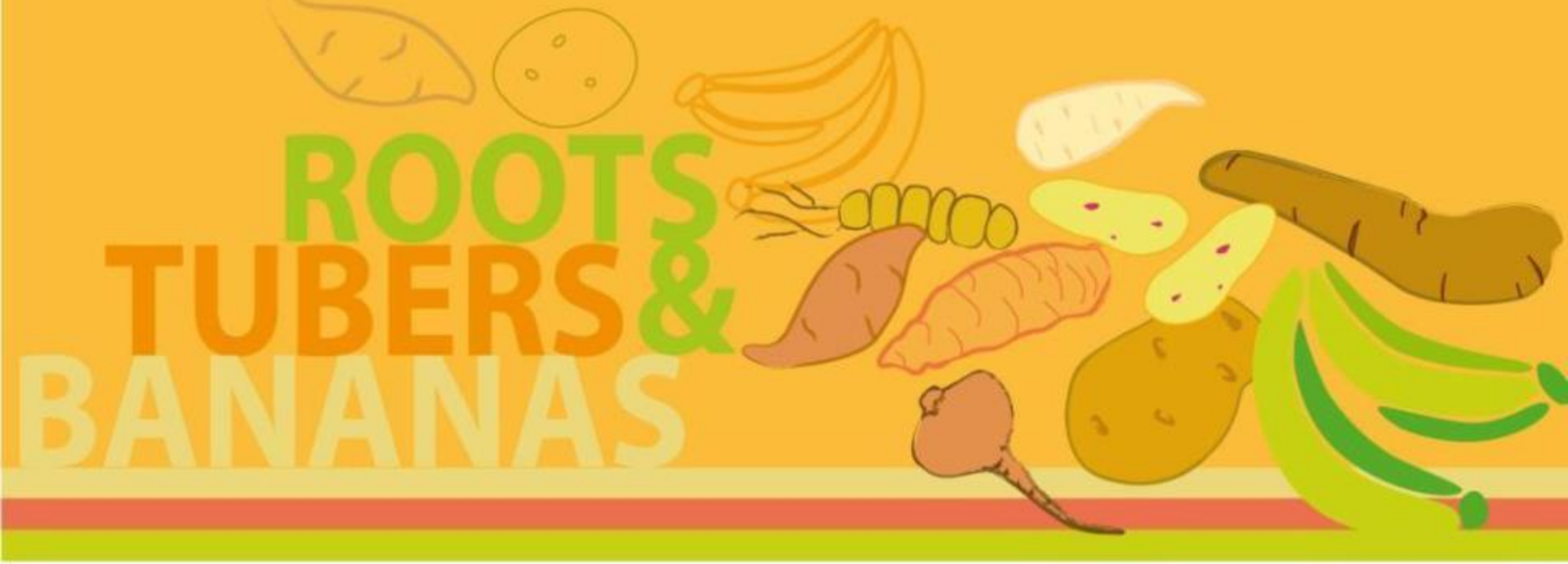


7th Annual SPHI Technical and Steering Committee Meeting
Addis Ababa, Ethiopia

Panel Discussion: The Way Forward on Weevils

What can we learn from past successful IPM programs in Latin America to control weevils in SSA?
Can we make better use of sexual pheromones?
How will climate change affect weevils in Africa?

J. Kroschel

International Potato Center (CIP), Agroecology/IPM, Lima, Peru

Globally 3 *Cylas* species

C. formicarius

C. puncticollis

C. brunneus

An IPM program was developed for *C. formicarius* and successfully implemented in Cuba in the 90s with strong support from the government (Lagnaoui et al. 2000).

→ Within 7 years 37000 ha under IPM

→ Reduction of weevil damage from 40% to 10%

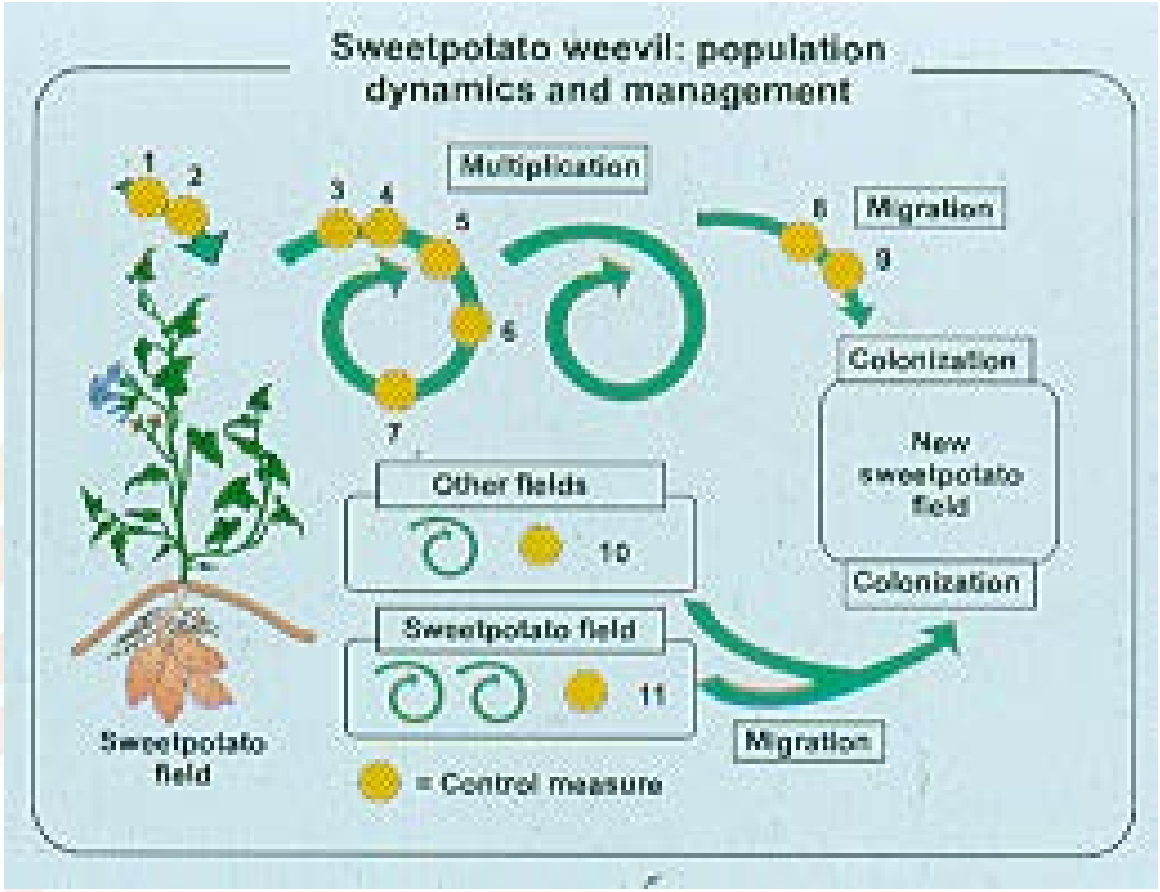
→ Yield increase from 3.5 to 7t/ha

What can be learned for the management of the African *Cylas* spp.?

SPW IPM management components

1. Res./tol. variety 2. Healthy cuttings

3. Sex pheromones



4. *Beauveria bassiana*

5. Predatory ants

6. Good hilling

7. Avoid soil cracking

8. Harvest at right time

9. Destroy crop residues

10. Destroy volunteer plants

11. Avoid planting to old neighboring fields

Conclusions for IPM of *Cylas* spp. in SSA

- **Plant Breeding**
  - Selection of varieties with precocity, deep rooting, high latex content
- **Cultural practices**
  - Is the infestation pattern of the different species similar?
- **Biological control**
  - Which entomopathogens of SPW occur in East Africa?
  - Are facilities available for mass production?
  - Can low-cost products be produced and made available for farmers?
- **Use of sexual pheromones**
  - Sex pheromones of African *Cylas* spp. are less effective!
  - Can we improve efficacy?
  - Can other trapping systems be developed and used?

Clon INIVIT B-88 (deep)

Improvement of sexual pheromone composition and use in an attract-and-kill approach

C. puncticollis/C. brunneus: The synthetic pheromones were found to be sufficiently attractive for monitoring weevils but not appropriate for mass trapping or mating disruption (Downham et al. 2001).

Our results revisiting the sexual pheromone composition in collaboration with the Institute of Chemistry, UoH, Germany, showed:

→ Each species produces a distinct bouquet of volatile major sex pheromone components, which act as synergists to the major compound (palmitic acid, methyl linoleate, and cholesterol).

→ Highest biological activity to attract males was by palmitic acid and the combination with the sexual pheromone increased attractiveness of males of *C. puncticollis*. Needs more research for *C. brunneus*.

→ *C. puncticollis* sex pheromone has a higher efficacy to attract males than the sex pheromone of *C. brunneus*. Lower amounts of pheromones are needed to achieve similar efficacy.

→ For practical field applications it is important to know which of the two *Cylas* spp. is more damaging in the field.

→ UoH developed a highly efficient synthesis of the sex pheromones which could be used for a cost-effective, large-scale production.

Attract-and-kill approach

Pheromone + contact insecticide + vegetal oil + UV absorbents + stabilizers
(Kroschel & Zegarra: Pest Manag Sci 2010, 2013)

Attract-and-kill has been successfully developed for several pests; e.g.: for potato tuber moth control.

First results:
The formulation of *Cylas* sex pheromones with low-toxic contact insecticides caused a mortality of 70% and 95% of *C. brunneus* and *C. puncticollis* males within 48 hrs.
Next steps: Developing and testing practical field applications.

Effect of climate change on *C. puncticollis*

Research Program on Roots, Tubers and Bananas

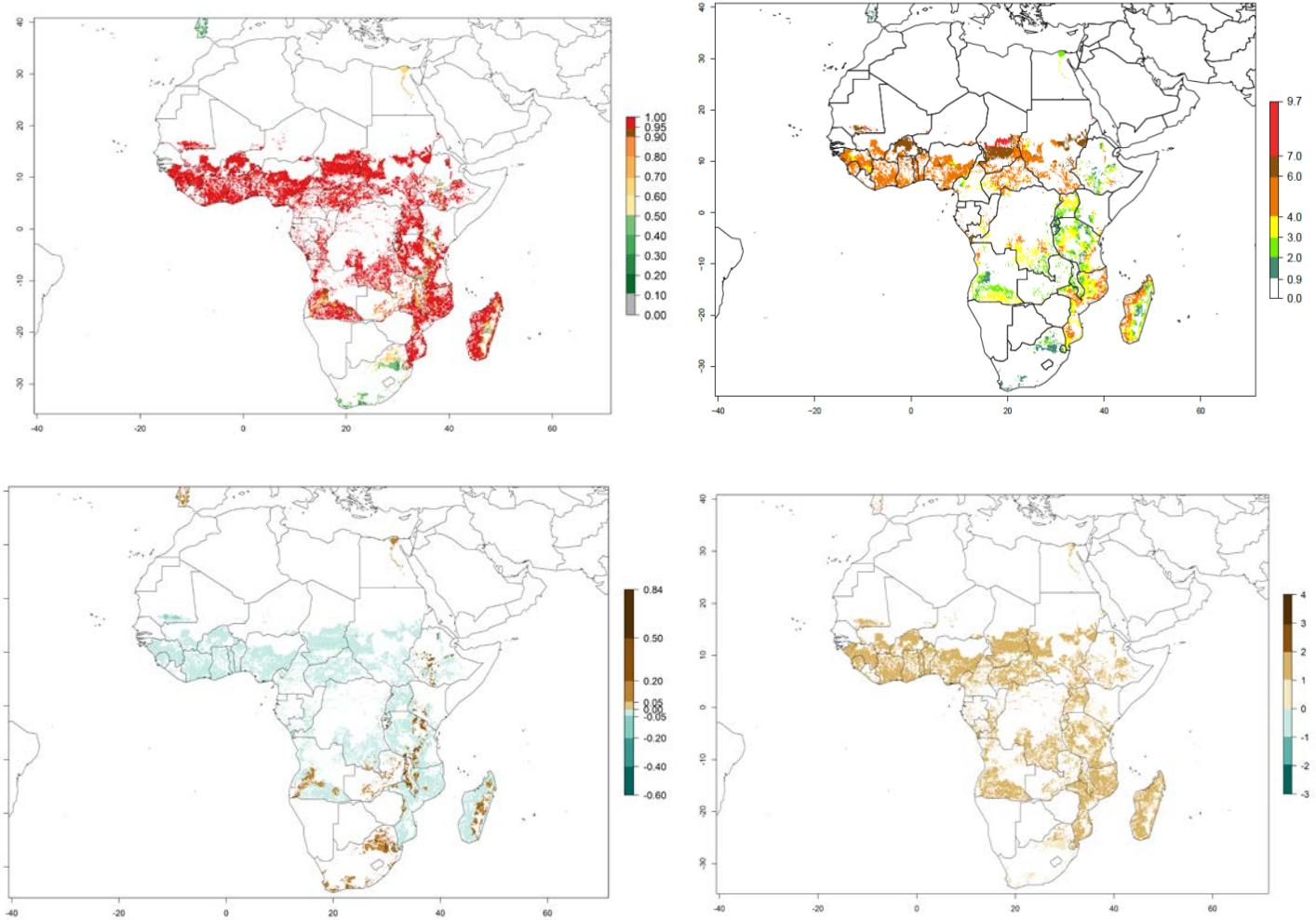
CGIAR

Establishment Index

Generation Index

2000

Index change (2000 – 2050)



New publication

Research Program on Roots, Tubers and Bananas

Pest Distribution and Risk Atlas for Africa

Potential global and regional distribution and abundance of agricultural and horticultural pests and associated biocontrol agents under current and future climates