Biological Control Agents:
Product development in developing & transitional countries

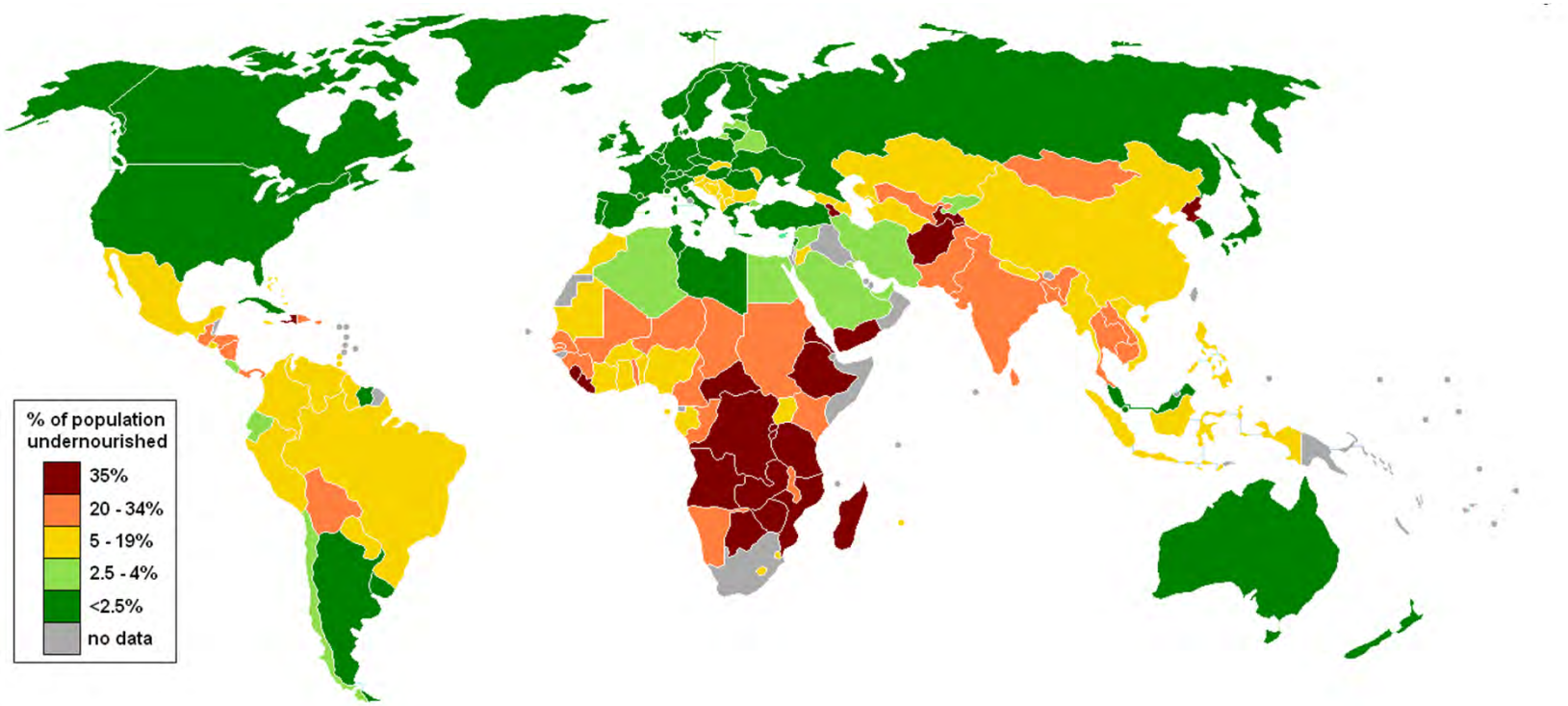
RATIONALE

BIOPESTICIDE STRATEGISTS

Roma Gwynn

Biological Control Agents - role in food security

In last 40 years farmable land per person has halved



30 - 40% of crops are lost before harvest and > 10% after harvest

Source: UN World Food Programme and the FAO
"The State of Food Insecurity in the World 2006" report.

RATIONALE
BIOPESTICIDE STRATEGISTS

Millennium Development Goals

190 country signatories – to be achieved by 2015

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV and AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

United Nations Summit in 14-16 September 2000

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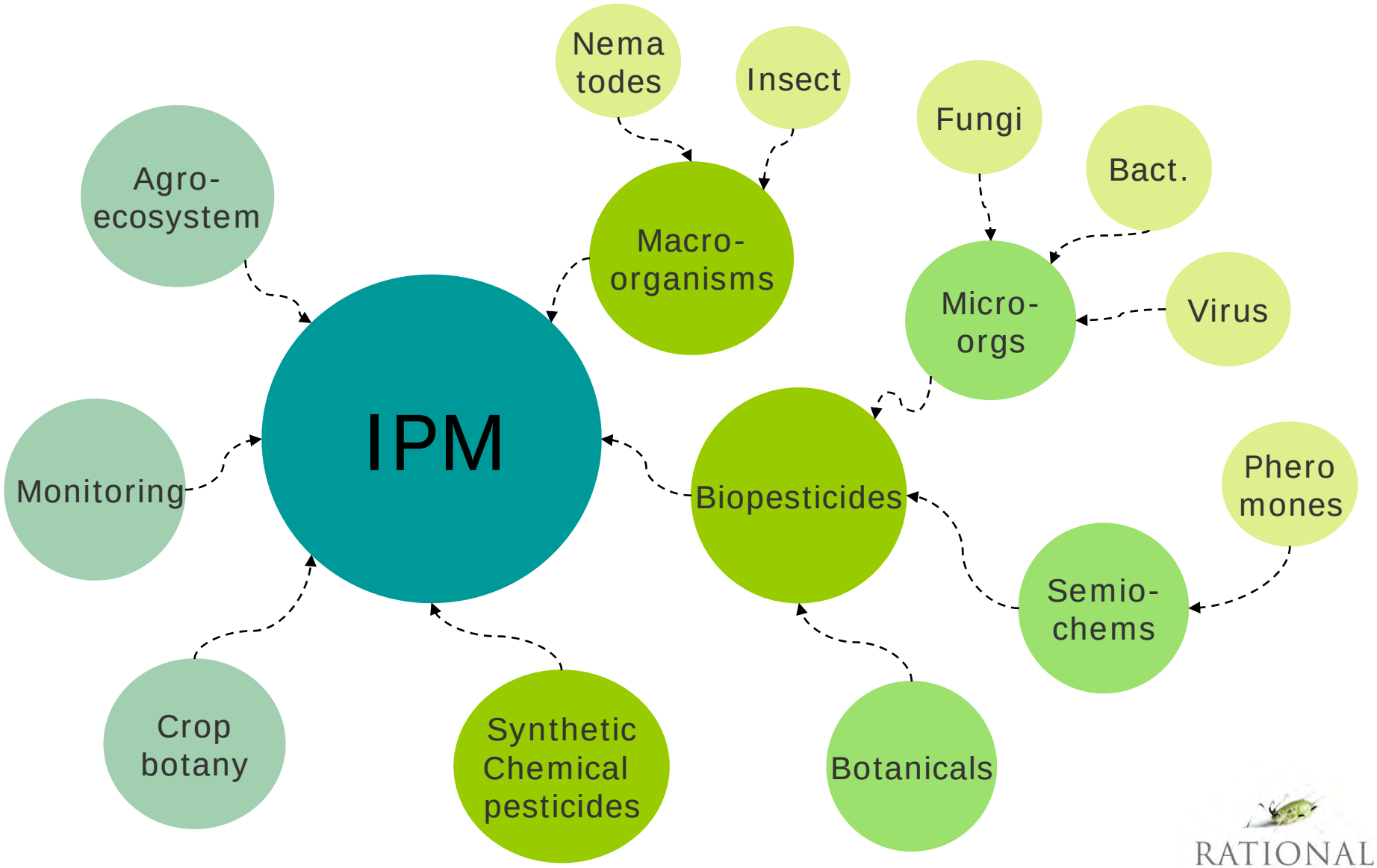
IPM – sustainable crop protection



RATIONALE
BIOPESTICIDE STRATEGISTS

BCA for developing and transitional countries

- Much research effort - few products or little direct impact until recently

Macro-organisms

Semio-chemicals

Plant extracts

Micro-organisms

RATIONALE
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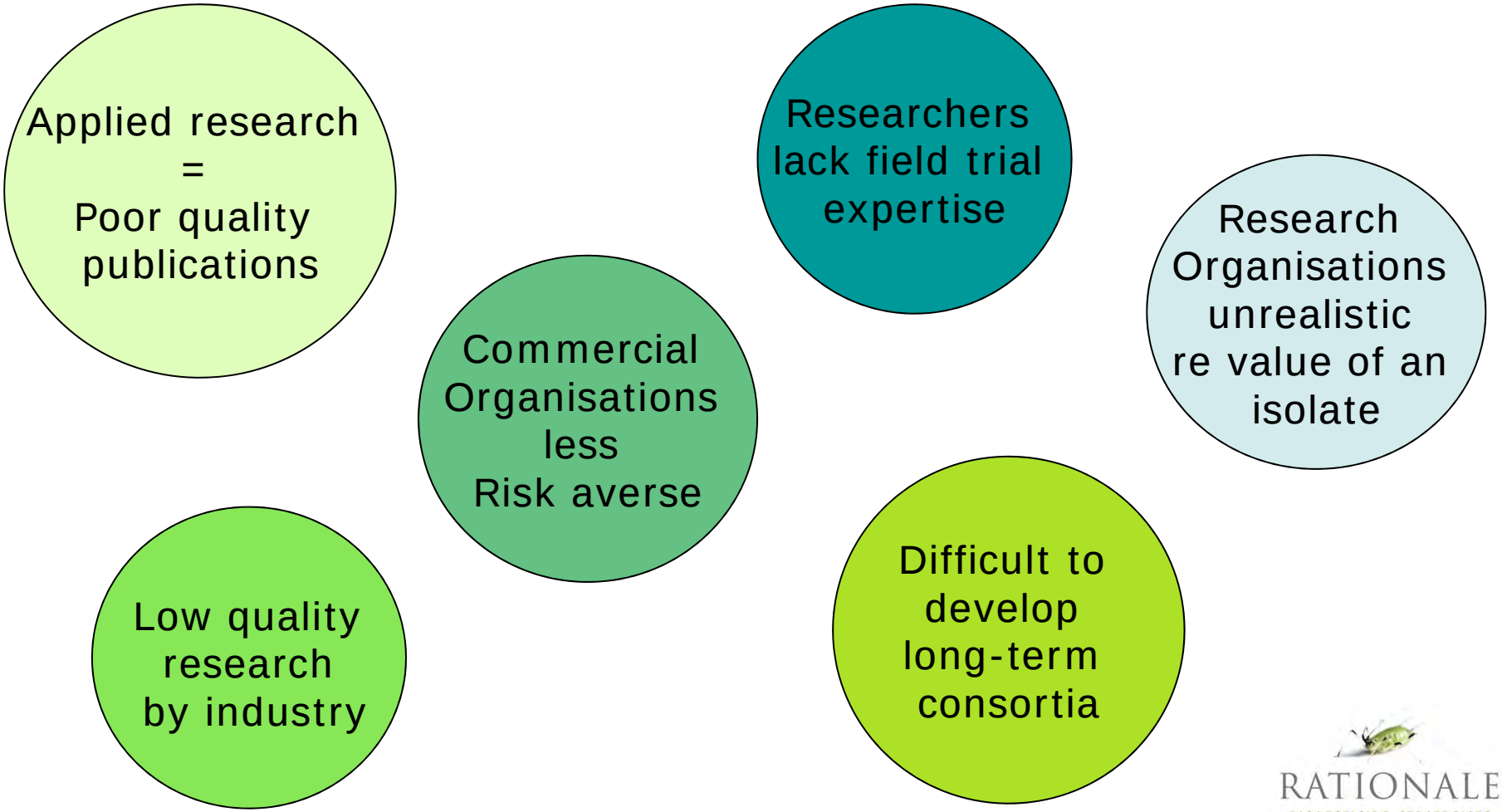
Research versus commercial products

Cultural differences between research and producer organisations that can impede product development



RATIONALE
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Why no products ?

Role of funding organisations in successful product development

- Donors scope only from research organisations
- First point of search – scientific papers not products available
- Supply driven by technical know-how not grower need
- Traditional links between researcher institutes and donors - bias work
- Donors often exclude commercial involvement
- Project rarely include product development route or registration,
- Funding cycles short

RATIONALE
BIOPESTICIDE STRATEGISTS

Successful projects

BCA projects leading to products

- Baculovirus – control of Armyworm (*Spodoptera exempta*) in Tanzania
- Baculovirus – control of DBM, *Heliothis armigera, Spodoptera exigua* in India and Thailand
- Pheromone – control of Yellow Stem Borer in India
- *Pasteuria penetrans* - a bacteria active against Root Knot Nematodes
- *Pochonia chlamydosporium* - a fungus active against RKN
- LUBILOSA Project – *Metarhizium anisopliae* for locust control

RATIONALE
BIOPESTICIDE STRATEGISTS

Donor funded BCA projects - Reasons for success

Reasons for successful product development from funded projects

- Take up of BCA often depends on commitment and drive of scientist involved
- Products developed in partnerships with commercial producers
- Market demand for products
- Policy framework encourages uptake
  - government pragmatic approach to regulations and registration
  - government funds work and/or subsides product
  - support from research institute
- Good quality control of final product

RATIONALE
BIOPESTICIDE STRATEGISTS

BCA for developing and transitional countries

BCA - in countries exporting fresh produce

- BCA common in countries with strong fresh produce export industry
- Kenya >40 BCA registered - imported and in-country production
- Good outreach from exporter BCA use e.g. in Kenya flower industry employs around 55,000* people many will see BCA in use.

Beyond export growers and exporter countries ?

* Fairtrade Foundation - November 2008

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BCA research - products

BCA Projects with industry

- UK Research into Use programme: www.researchintouse.com
- COLEACP – PIP project: http://pip.coleacp.org/en
- GTZ: www.gtz.de/en/themen/laendliche-entwicklung/17728.htm

RATIONALE
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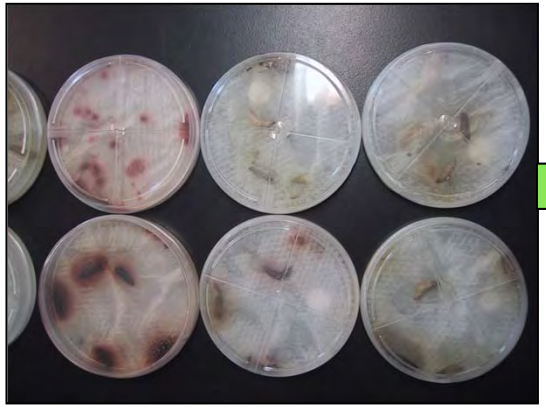
Product development – Research organisations

Features of a typical product development pathway

- Linear
- Follows funding cycles (series of 2 - 3 year project)
- Long laboratory based studies
- Quasi commercial – e.g. try production, formulation
- Develop own isolates – supply driven



Product development - Research organisation

Linear product pathway	Time line
Bioprospecting survey or isolate acquisition	Up to 18 months
Petri dish screen activity y/n	Up to 6 months
Petri dish tests dose rate	Up to 1 year
Petri dish tests environmental parameters	Up to 1 year
Pot tests in controlled conditions	Up to 6 months

Total time ~ 4.5 years

RATIONALE
BIOPESTICIDE STRATEGISTS

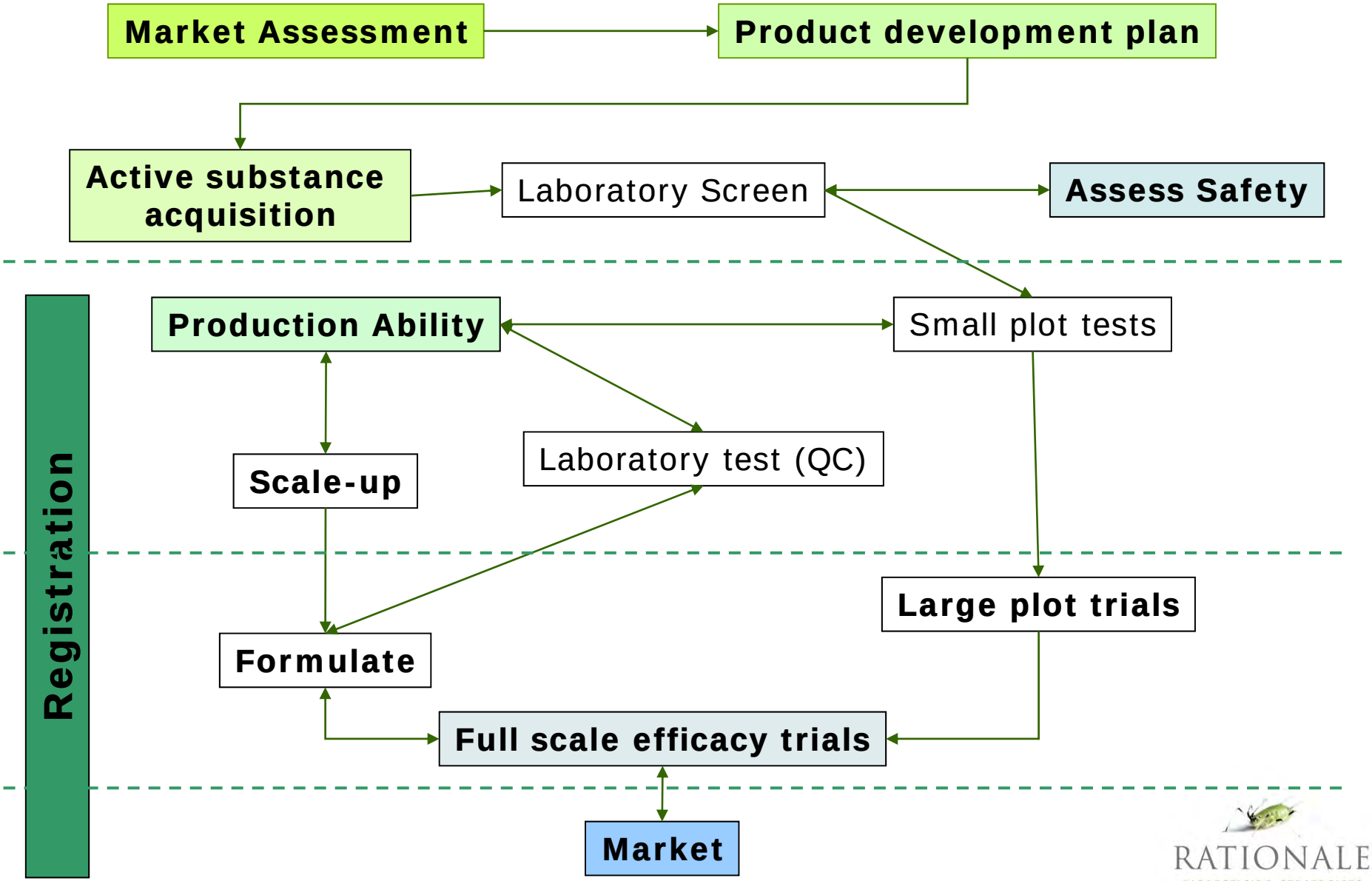
Product development - commercial company

Features of a 'typical' commercial product development

- Matrix pathway
- Project market driven
- Funding resource and success driven
- Short laboratory phase – focus on field efficacy
- Applied tests in glasshouse and field
- Managed by team
- Production capability important
- Regulatory issues addressed early

RATIONALE
BIOPESTICIDE STRATEGISTS

Product development - commercial company



RATIONALE
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Recommendations for donor supported BCA

- Answer these questions first:
  - What is the market – clearly define
  - What are the potential solutions – cost/benefit analysis
  - Is there a product already available that can be used ?
  - Does the substance work in the field ?
- Involve commercial expertise at concept stage
- Production research – confirm feasibility and worker safety
- Develop long term partnerships – need to be realistic that this often is not be full-time research
- Project lead by commercial producer – research as service providers
- Donors – work with commercial organisations
- Include registration consideration

RATIONALE
BIOPESTICIDE STRATEGISTS

Embed BCA technology

- Reliable good quality production
- Harmonised proportion regulatory system
- Facilitating government policy
- Facilitating regulatory environment – BCA specific
- Good technology transfer
- Good extension service for using products
- Expertise in IPM

RATIONALE
BIOPESTICIDE STRATEGISTS

BCA Business options

- Importing of technology already available as products
- Develop in-country capacity directed to export growers
- Develop potential for small growers to access products
- Not-for-profit and co-operative business e.g. Cuba

RATIONALE
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BCA production - consortia

To develop BCA capacity in developing and transitional countries

- Build consortia – industry, research, regulations, policy
- Industry lead – directing research goals
- Determine markets and project feasibility – for all product development steps including grower training
- Determine product cost and affordability for end user
- Engage with policy makers and regulators for capacity building
- In-country partner to establish facilities and staff
- Establish business model to be adopted
- Identify technology transfer and training routes.

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Thank you for your attention

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