



FALL ARMY WORM



NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

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GrainSA Congress
9 March 2017



Identification



agriculture,
forestry & fisheries

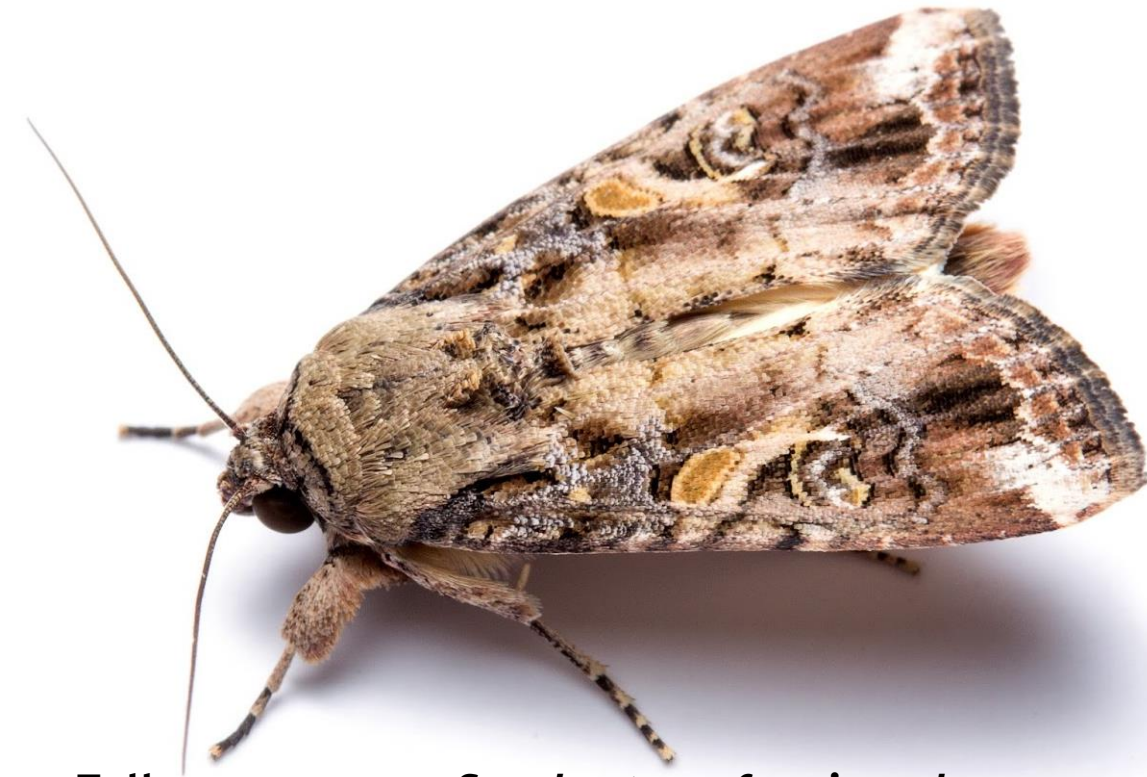
Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

MEDIA RELEASE

3 FEBRUARY 2017

**PEST ALERT: DETECTION OF *SPODOPTERA FRUGIPERDA* (FALL ARMY WORM)
FOR THE FIRST TIME IN SOUTH AFRICA**

The Department of Agriculture, Forestry and Fisheries (DAFF) today received a diagnostic report from the Agricultural Research Council, Plant Protection Research Institute (ARC PPRI) to confirm that the Fall Army Worm was positively identified from samples collected in the Limpopo Province. The samples were jointly collected by scientists from the ARC Grain Institute and the North West University. These were caterpillars that had to pupate and emerge as moths before a positive identification could be done.



Fall armyworm - *Spodoptera frugiperda*



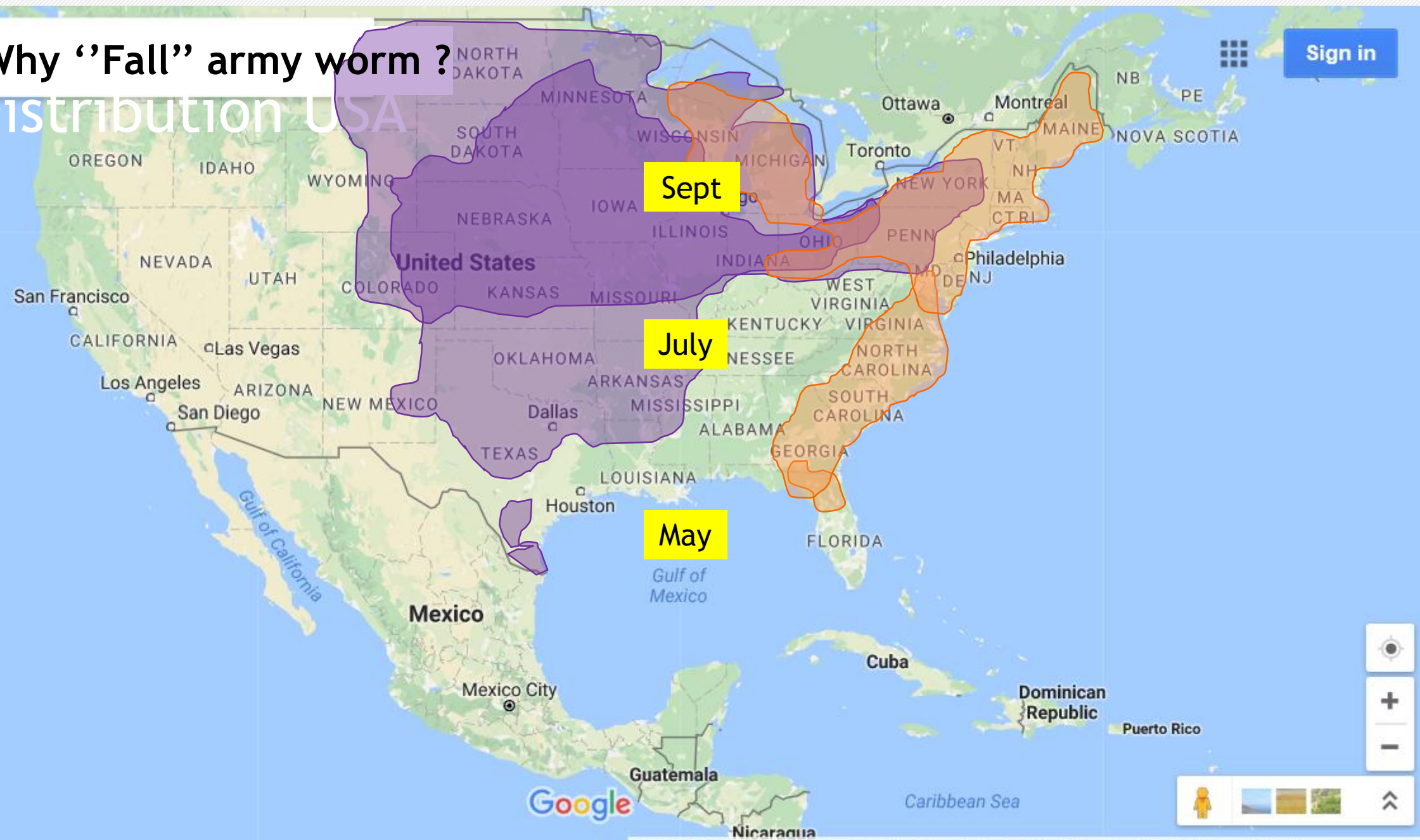
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Why "Fall" army worm ?

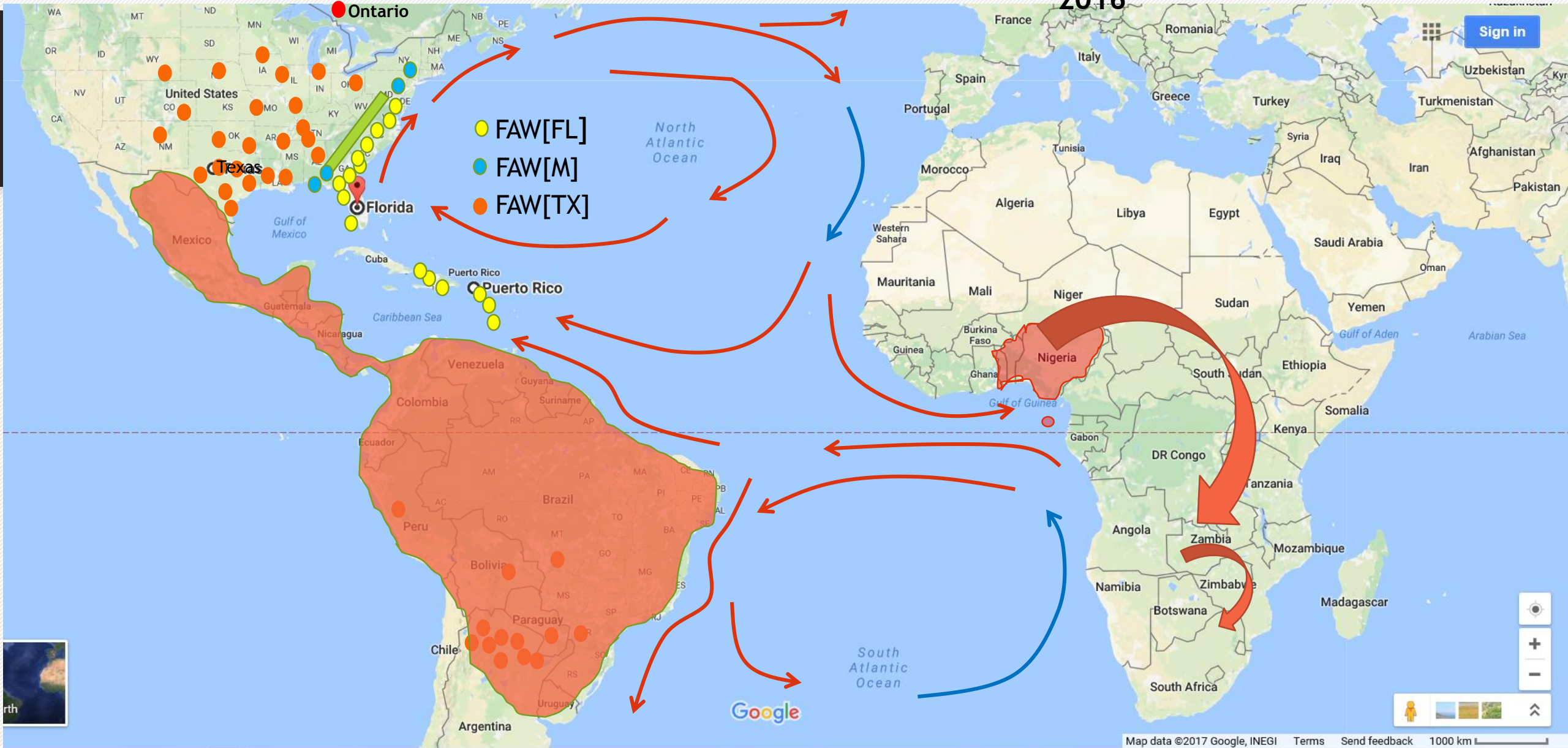
Distribution USA

Sign in



How did it get to Africa?

2016

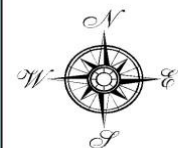
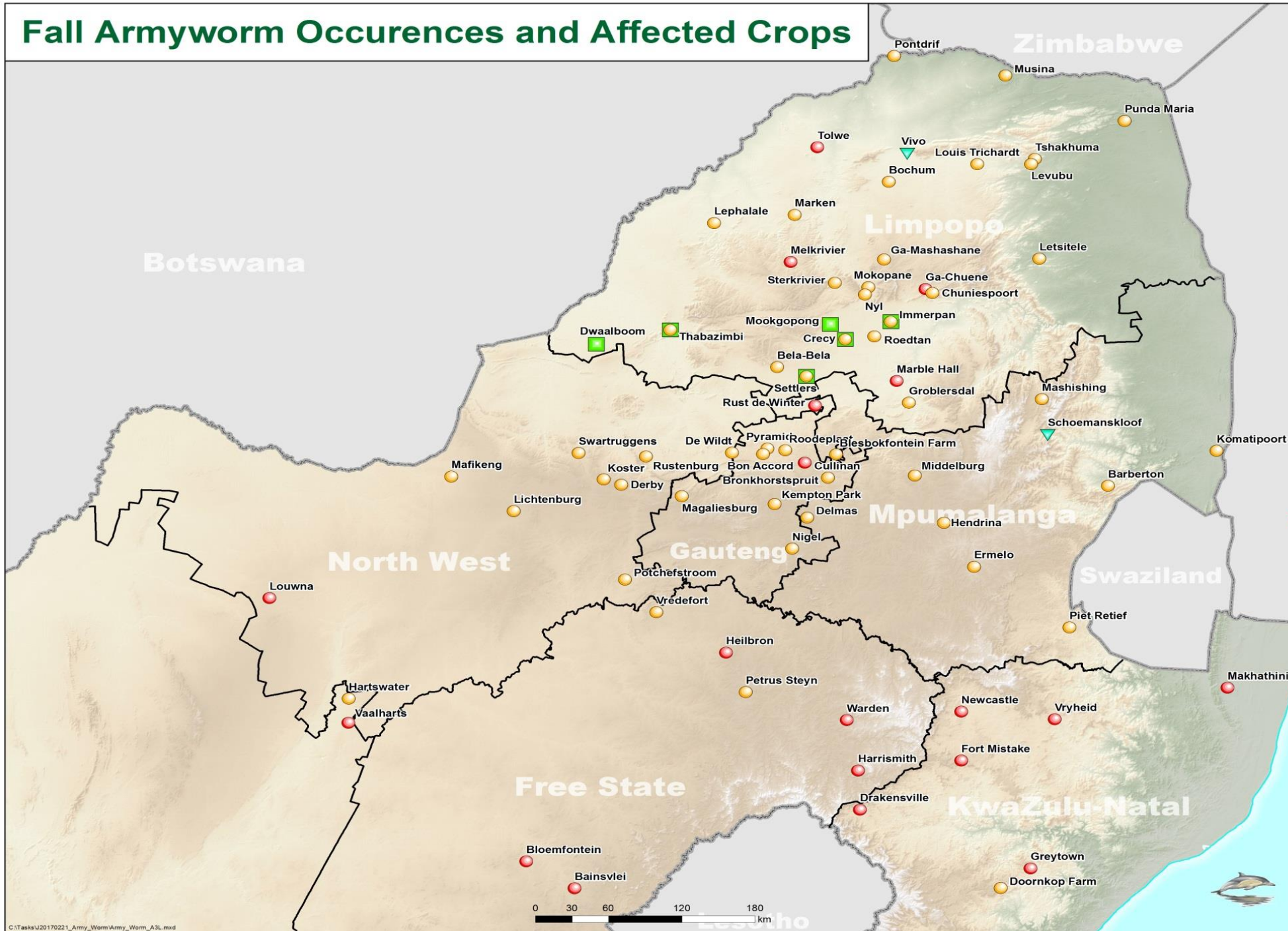


Fall Armyworm Occurrences and Affected Crops

-  International Boundaries
-  Provincial Boundaries
-  Coastline

Affected Crops

-  Maize
-  Sorghum
-  Sweet Corn
-  Other



Biology

- No diapause stage
- Will FAW establish in SA?
- Will FAW re-invade each growing season or will it be sporadic?

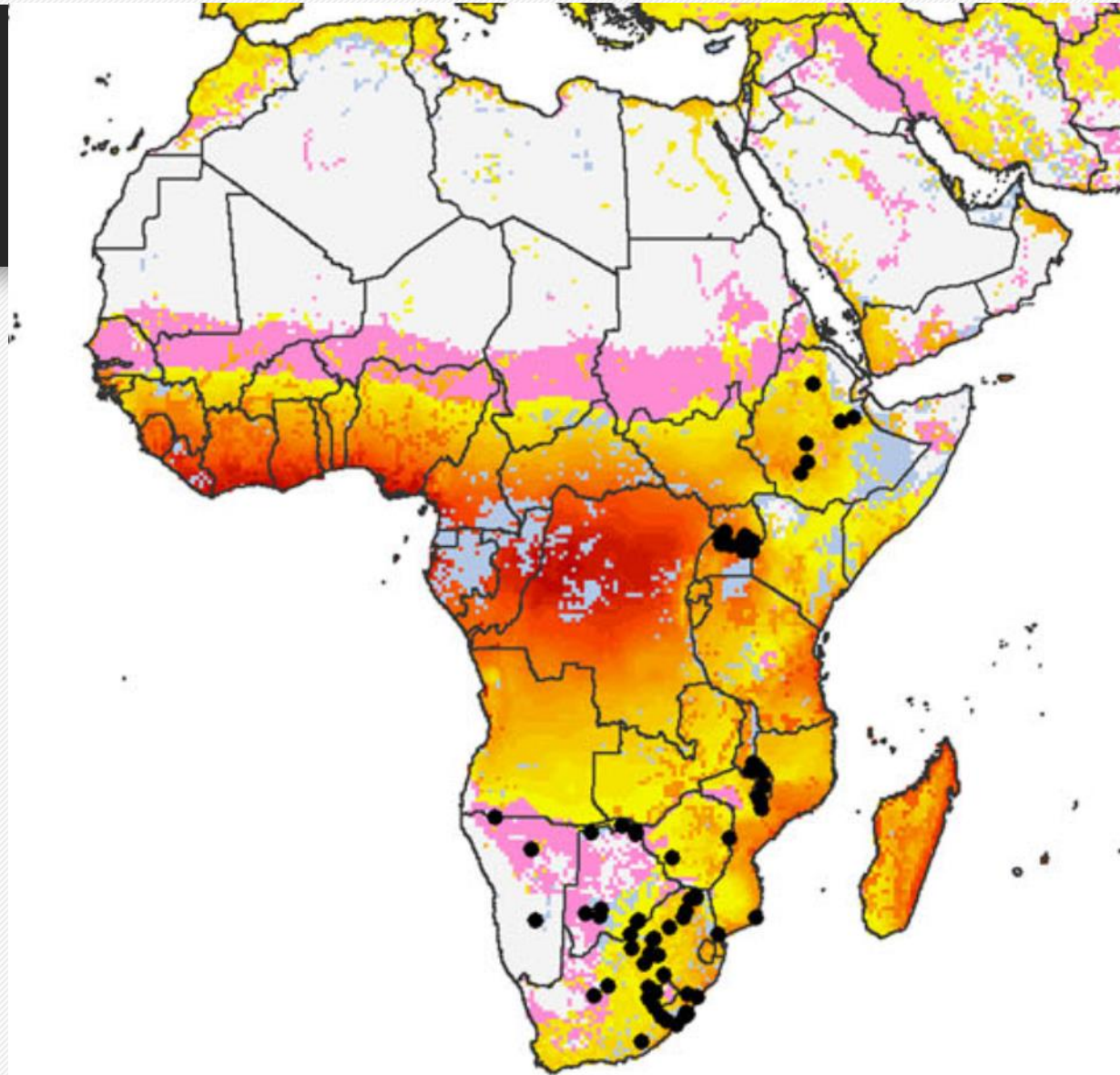
- Other host plants (grasses!)
- Moth flight distance - University of Exeter (UK)
- Moth flight patterns - pheromone traps
- Will it behave the same as in the Americas?

Identification - behavioural differences

- **Rice strain** - rice, pasture, alfalfa, Bermuda grass
- **Maize strain** - maize, sorghum, cotton
- Collaboration with **Max Planck Institute in Germany** - Prof D. Heckel

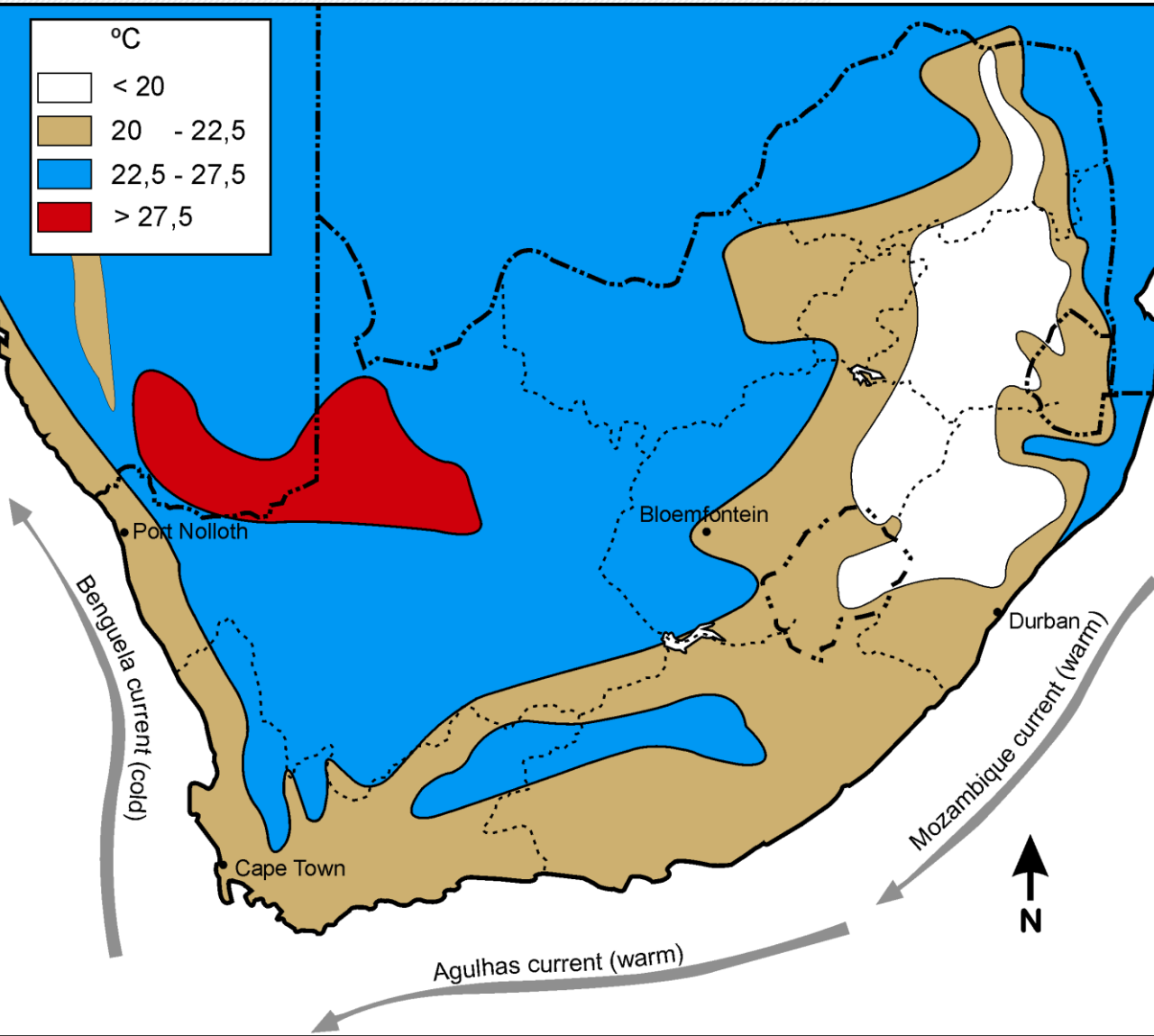
Ecological modelling for prediction purposes

- CLIMEX modelling
- Pest development at different temperature
- Predict areas of establishment
- Based on similar studies on *Busseola fusca* and *Chilo partellus*.
- A study commenced at NWU

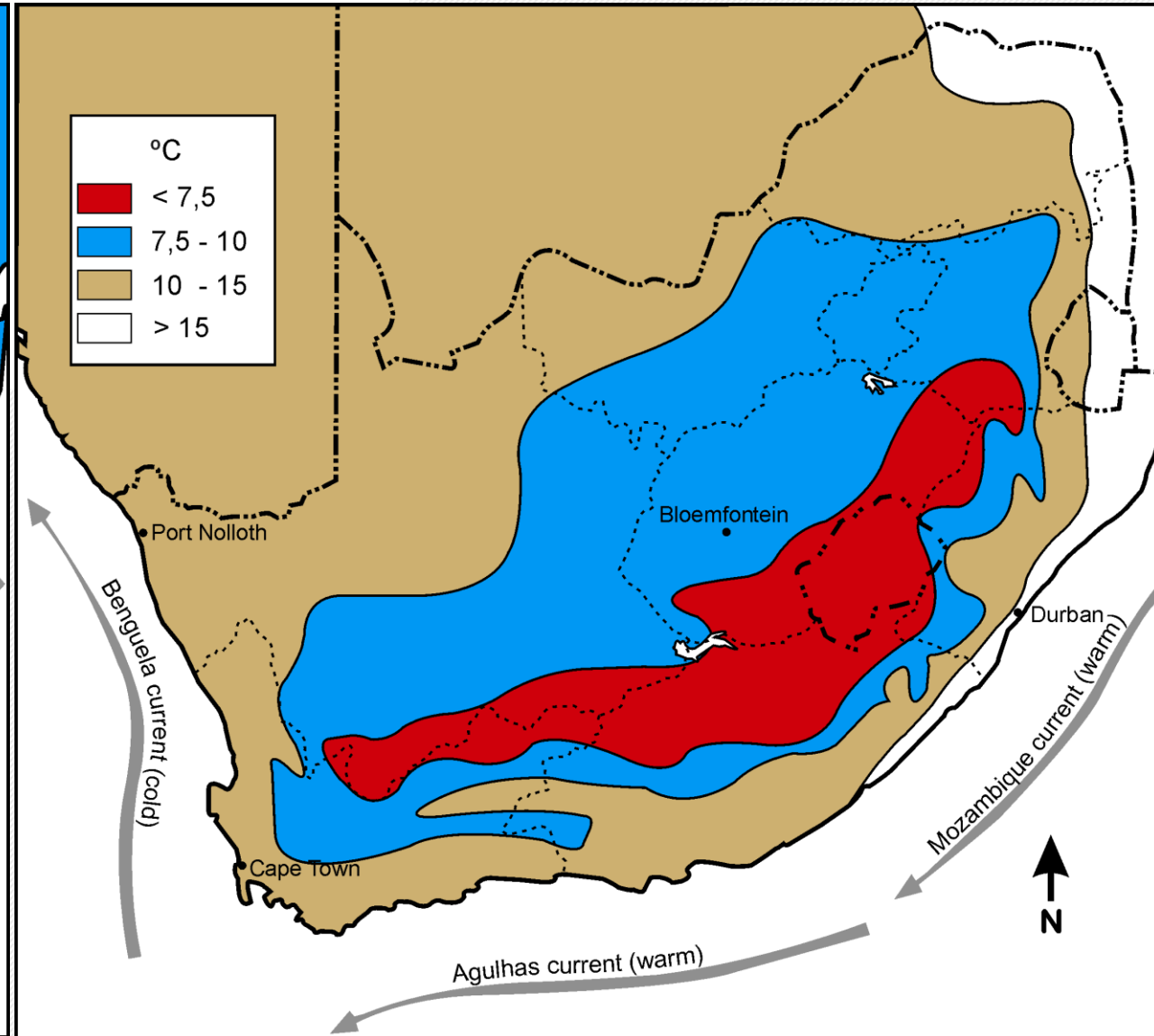


Modelled distribution of *Chilo partellus*

Summer temperatures



Winter temperatures



MANAGEMENT

- Scouting - early warning
- Chemical control - **action thresholds**
(5-40% infested plants; **5% plants with eggs**)
- Bt maize
- Grassy weed management



Chemical Control

- Know from literature: resistance to insecticides develop
- Newly registered insecticides

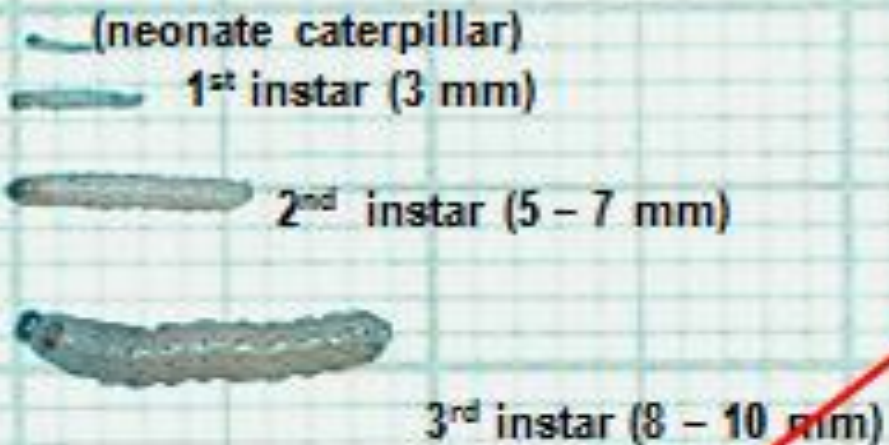
www.croplife.co.za/

Chemical Control

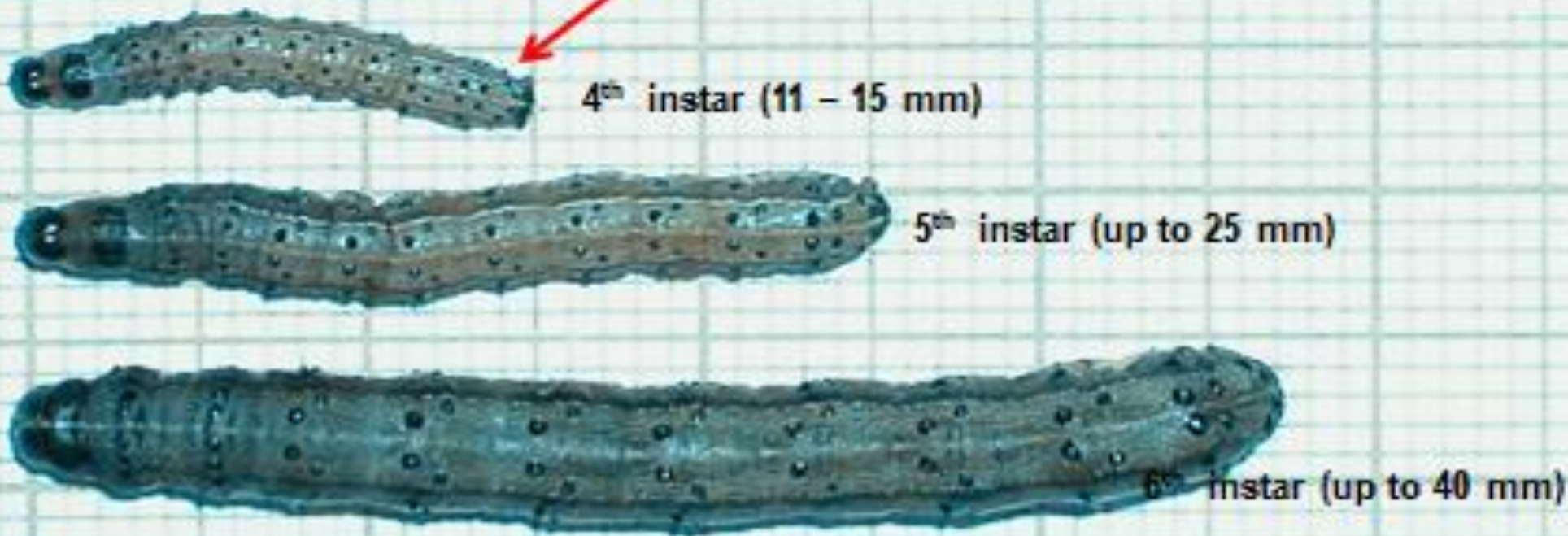
Active ingredient(s)	Trade name	Reg. nr.	Status	Reg holder
Indoxacarb	Steward 150 EC	L8435	Registered	DuPont de Nemours
Indoxacarb	Advance 150 SC	L9147	Registered	Universal Crop Protection
Indoxacarb	Steward	L6332	Registered	DuPont de Nemours
Indoxacarb	Addition 150 SC	L9146	Registered	Villa Crop Protection
Indoxacarb	Doxstar Flo	L9884	Registered	Meridian Agrochem. Company
Chlorantraniliprole	Coragen	L8529	Registered	DuPont de Nemours
Chlorantraniliprole/Lambda-cyhalothrin	Ampligo	L8685	Registered	Syngenta
Chlorantraniliprole	Prevathon 5 SC	L9150	Registered	DuPont de Nemours
Emamectin benzoate	Emma	L9022	Registered	Arysta LifeScience
Emamectin benzoate	Proclaim	L7581	Registered	Syngenta
Emamectin benzoate	Vitex 50	L9525	Registered	Meridian Agrochem. Company
Emamectin benzoate	Promec 20 EW	L9729	Registered	Meridian Agrochem. Company
Emamectin benzoate	Warlock 19.2 EC	L9872	Registered	Adama South Africa
Flubendiamide	Belt	L8860	Registered	Bayer
Methomyl	Spitfire 900 SP	L8197	Registered	Bitrad Consulting
Methomyl	Cyplamyl 90 SP	L3436	Registered	Castle Ag-Chem
Methomyl	Masta 900 SP	L9449	Registered	Arysta LifeScience
Methomyl	Methomyl 200 SL	L7100	Registered	Universal Crop Protection
Methomyl	Methomate 200 SL	L8123	Registered	Villa Crop Protection
Methomyl	Methomex 900 SP	L5254	Registered	Adama South Africa
Methomyl	Methomex 200 SL	L5253	Registered	Adama South Africa
Lufenuron	Sorba	L5343	Registered	Syngenta
Lufenuron	Judge	L9927	Registered	Arysta LifeScience
Spinetoram	Delegate 250 WG	L8329	Registered	Dow AgroSciences
Spinetoram/Methoxyfenozide	Uphold 360 SC	L10164	Registered	Dow AgroSciences
Benfuracarb/Fenvalerate	Oncol Super 220 SC	L7649	Registered	Dow AgroSciences
Chlorpyrifos	Avi Klorpirifos 480 EC	L4318	Registered	Avima
Chlorpyrifos	Agropyrifos	L4888	Registered	Arysta LifeScience
Chlorpyrifos	Pyrinex 480 EC	L4673	Registered	Adama South Africa
Profenofos	Farmag Profenofos 500	L5547	Registered	Castle Ag-Chem
Mercaptothion	Avi Gard (lawns only)	L0216	Registered	Avima
Novaluron/Indoxacarb	Plemax	L10246	Registered	Adama South Africa
Pyridalyl dichloropropene derivative	Sumipleo	L8377	Registered	Philagro South Africa
Carbosulfan	Marshall	L3314	Registered	FMC Chemicals

Insecticide application

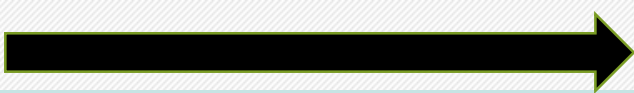
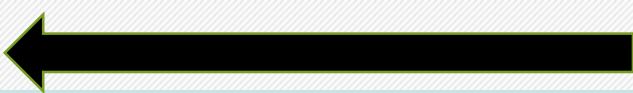
Fall army worm



Effective



Less effective



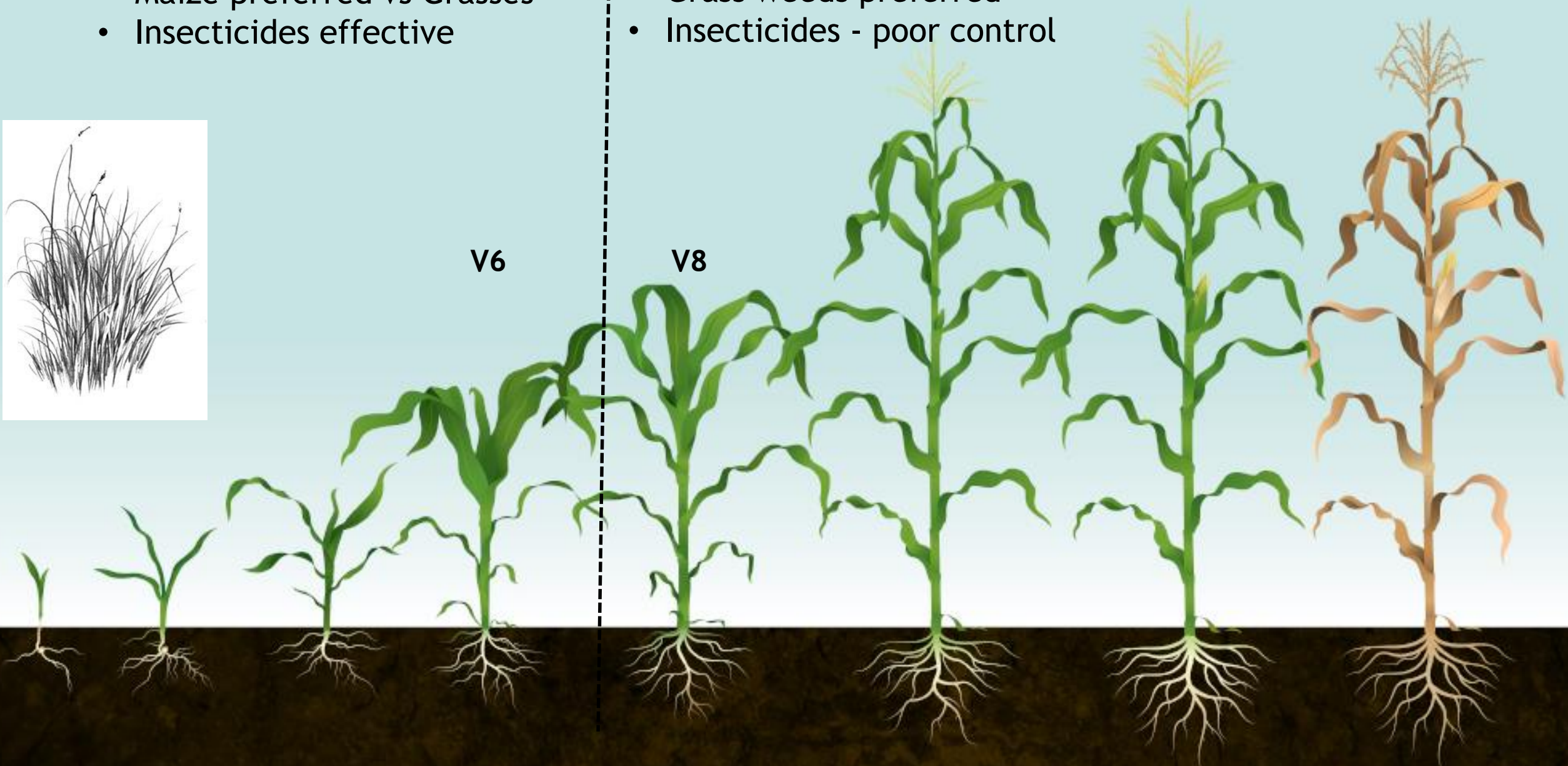
- Maize preferred vs Grasses
- Insecticides effective

- Grass weeds preferred
- Insecticides - poor control



V6

V8



Action threshold values

3%

5%

8%

20%

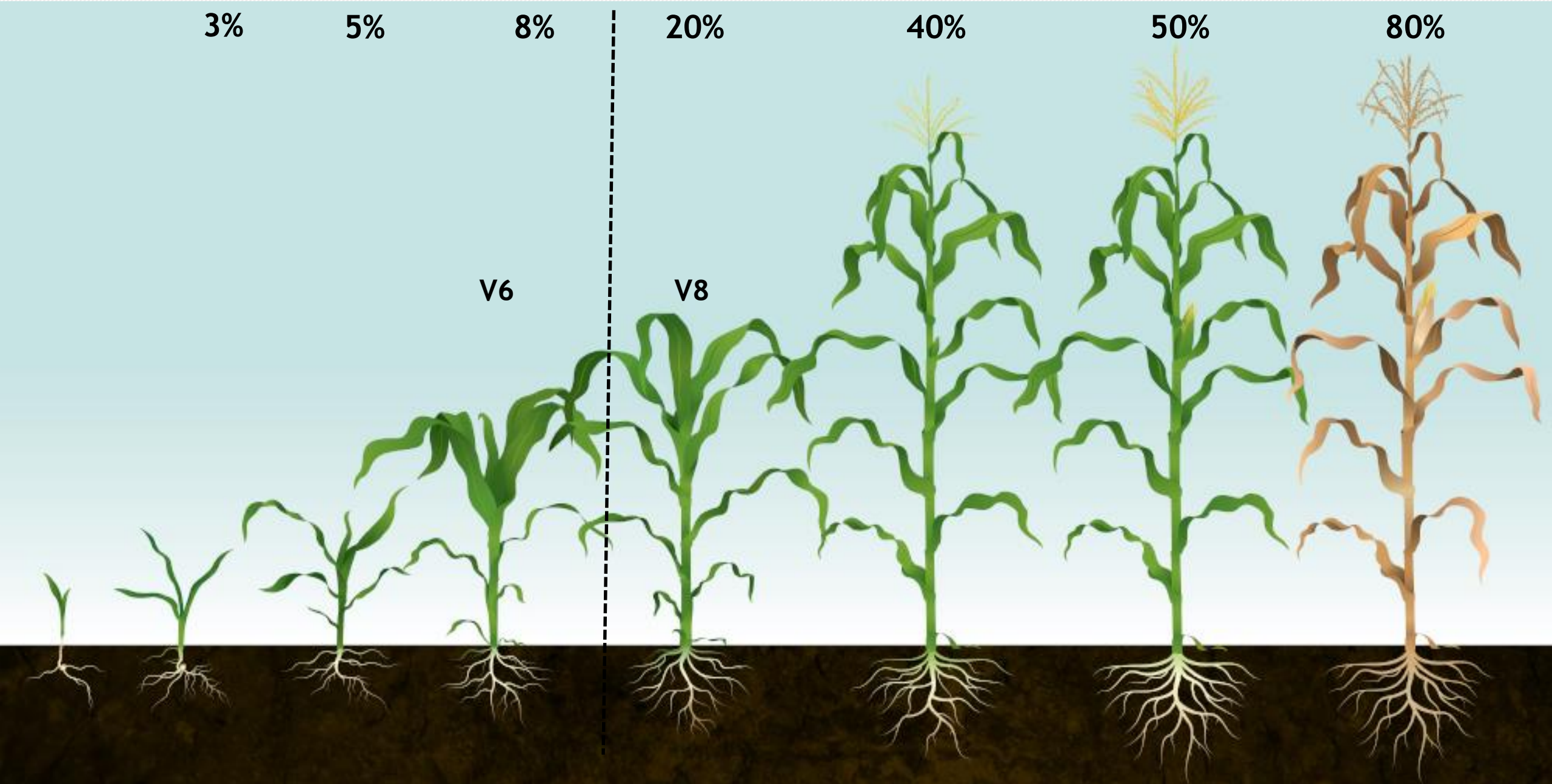
40%

50%

80%

V6

V8



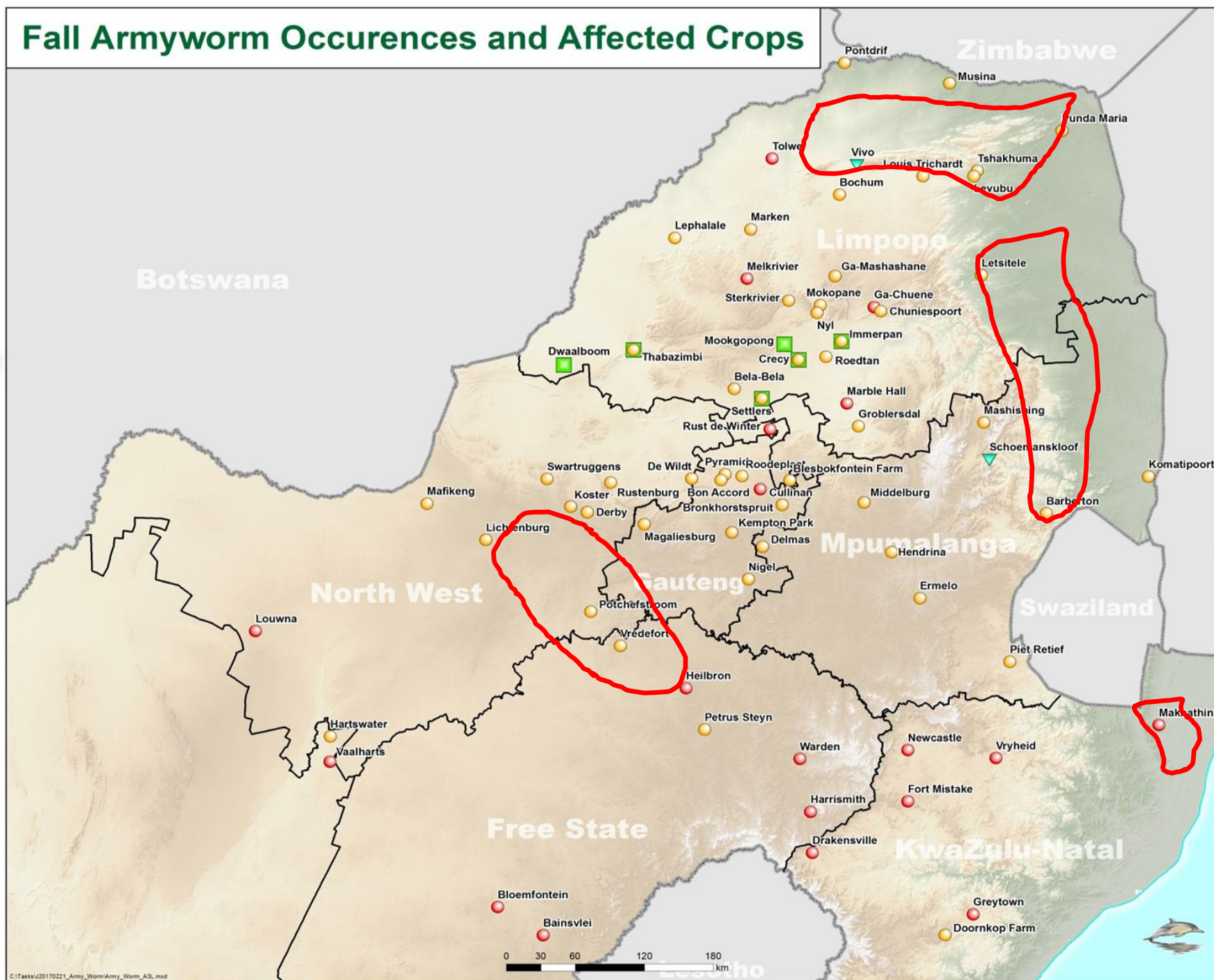
Control - Bt maize

- Bt suppresses FAW numbers - use in combination with other strategies
- Evaluate future and current commercial Bt events in SA
- Which FAW strain is present in SA? (Varying susceptibility to Bt events)
- Insect resistance management (refuges): re-invasion from North?

Future Research

➤ Field ecology studies

Fall Armyworm Occurrences and Affected Crops



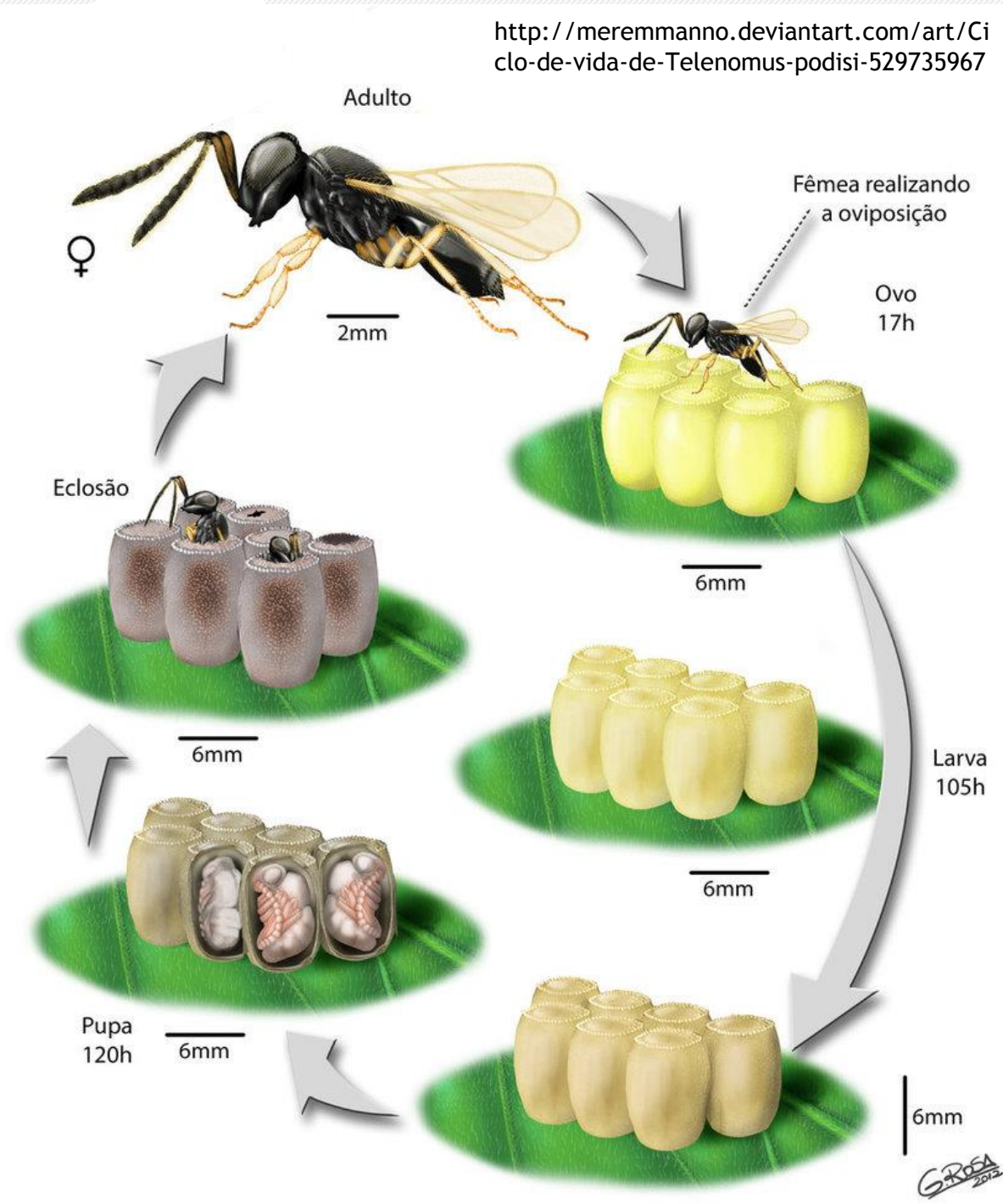
Biological control

➤ Biological control?

- entomopathogenic nematodes
- entomopathogenic fungi

➤ Do indigenous African parasitoids also attack FAW?

➤ *Telenomus* might be a early pick



Damage to other crops and wild grasses

- Sorghum
- Sweet corn
- Grasses, potato & other hosts





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THANK YOU

