Science For A Better Life

K-Obiol grain protectant

Reg. No. 4586 (Act 36/1947)

A flexible on-grain and structural treatment

August 2017 / Presenter: R. Jooste

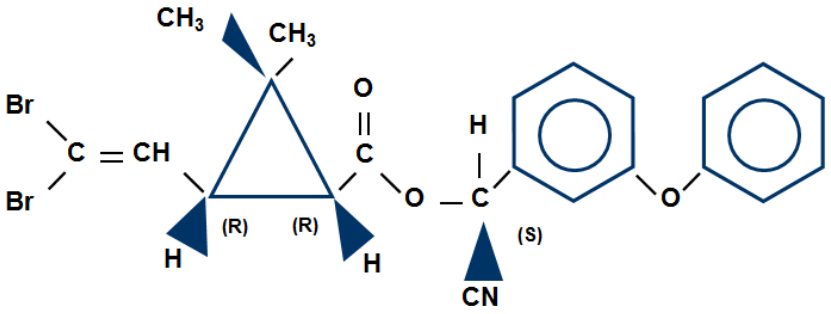
K-Obiol®

- Introduction to K-Obiol
- K-Obiol uses
- Benefits of K-Obiol (and residual treatments)
- Application
- Mode of action and efficacy
- K-Obiol as part of a resistance management program

Introduction: Active Ingredient

Deltamethrin : (IRAC class 3A) SP

- contact & stomach insecticide
- Nerve Poison
- High intrinsic insecticidal activity
- Broad spectrum control
- Long lasting activity
- Flexible uses
- Reasonable Tox. Profile



K-Obiol in the Bayer facility in Nigel, South Africa

With established MRLs, **K-Obiol is used in all major markets around the world**.

K-Obiol: benefits of Active Ingredient

Solubility at 20°C

- Low water solubility
- Good solubility in organic solvent

Thermal stability

- Excellent stability at high temperature (~150°C)

Photodegradation

- Deltamethrin is light stable (alfa-cyano group of SP's)

Preventive treatment
Deltamethrin provides long term protection of grains (6-12 month protective period in most countries)

Efficacious

- Exhibits flush out, knockdown and kill

Broader spectrum

- Broad spectrum activity against arthropods

Curative treatment
Deltamethrin kills susceptible insects present ON the grain

K-Obiol EC 25

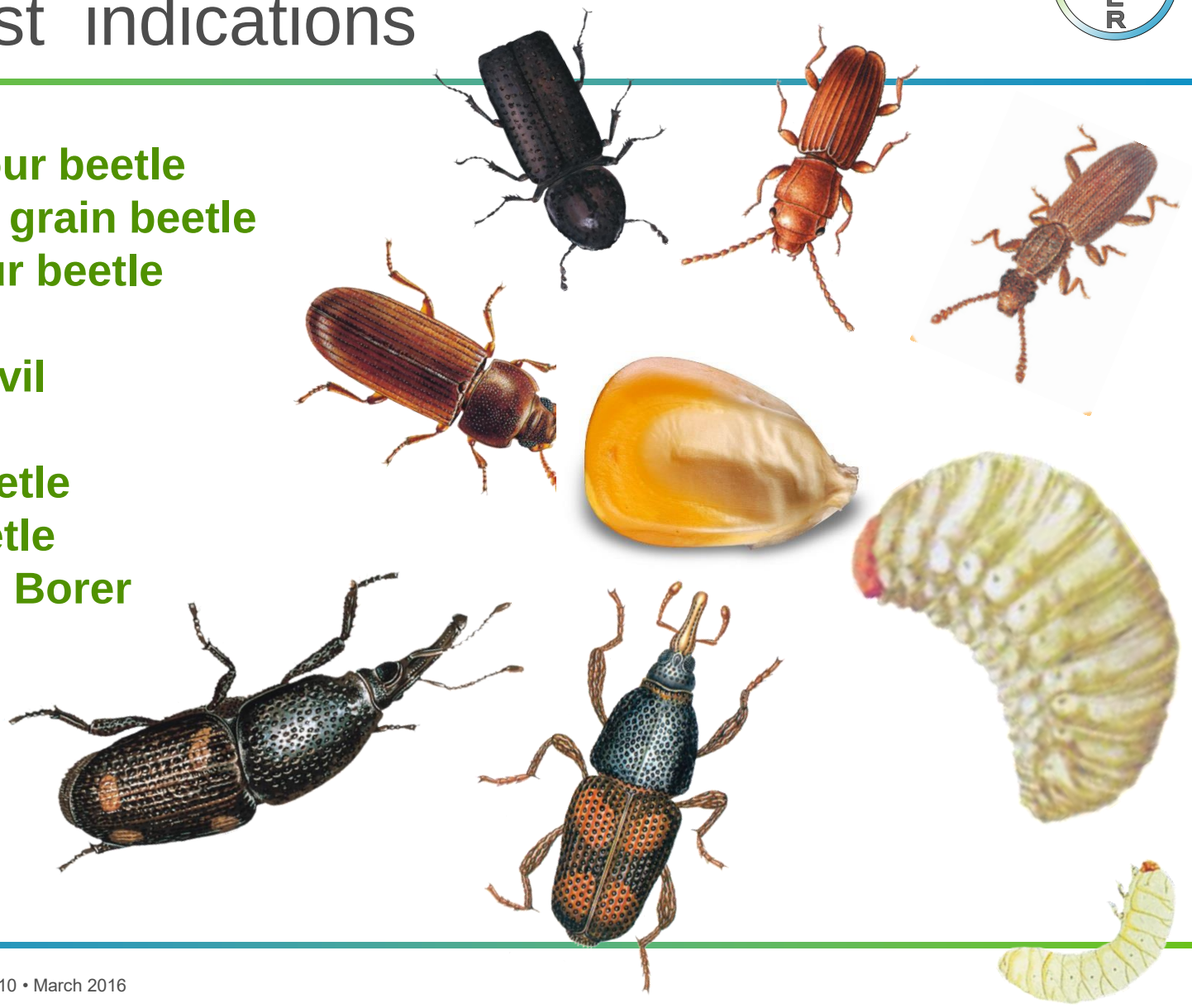
RSA Registration: Current

Deltamethrin	*25g/l*	
PBO (Piperonyl butoxide)	*225g/l*	(An SP mobiliser and potentiator)

- **Direct application:** Maize, wheat, rye, oats and sunflower in bulk storage
- **Seed treatment:** Tank mix application with registered fungicide mixtures for seed treatment.
- **Residual treatment of surfaces:** For use on non-porous surfaces in barns, warehouses and stores where grain is stored.
- **Fogging of storage facilities:** For use with a suitable fogging device.
- **Treatment of bag stacks:** Treatment of bag stacks with K-Obiol® EC 25 will prevent contamination of the grain by invading insects.

Label Pest indications

Confused flour beetle
Saw-toothed grain beetle
Rust-red flour beetle
Rice weevil
Granary weevil
Maize weevil
Flat grain beetle
Tobacco Beetle
Lesser Grain Borer



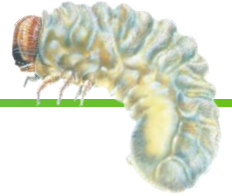
K-Obiol® benefits: residue

The right rate for good efficacy and safety

- ADI* 0.01 mg AI / kg body / day
- MRL 1 ppm (maize, wheat and barley)

K-Obiol at RSA label rate (0.75 ppm) offers a good safety margin against the MRL (1ppm)

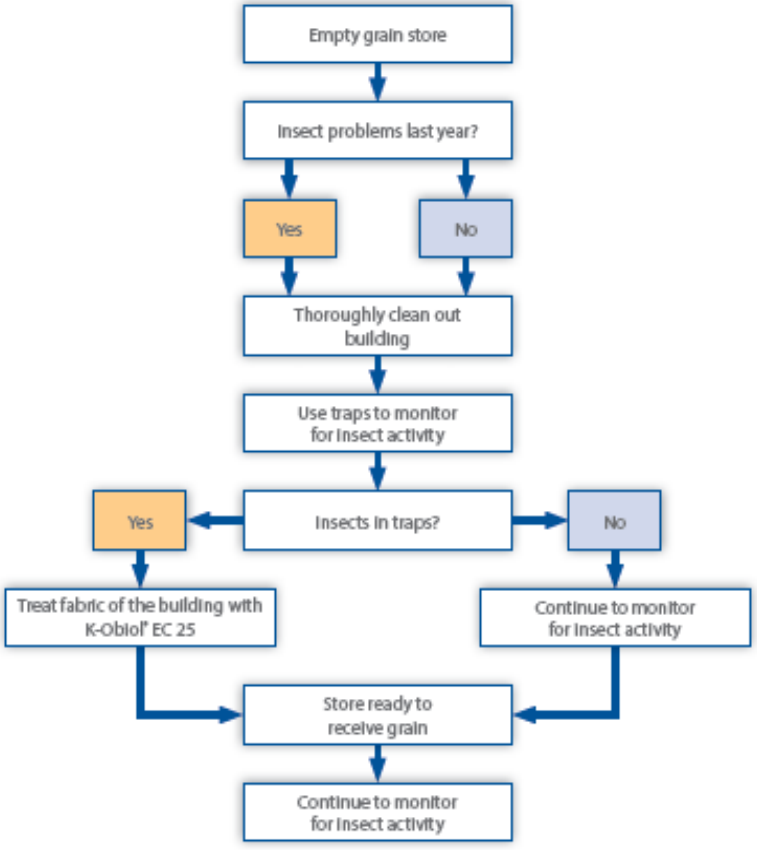
- K-Obiol requires no withholding period
- Seed treatment in slurry with suitable fungicide



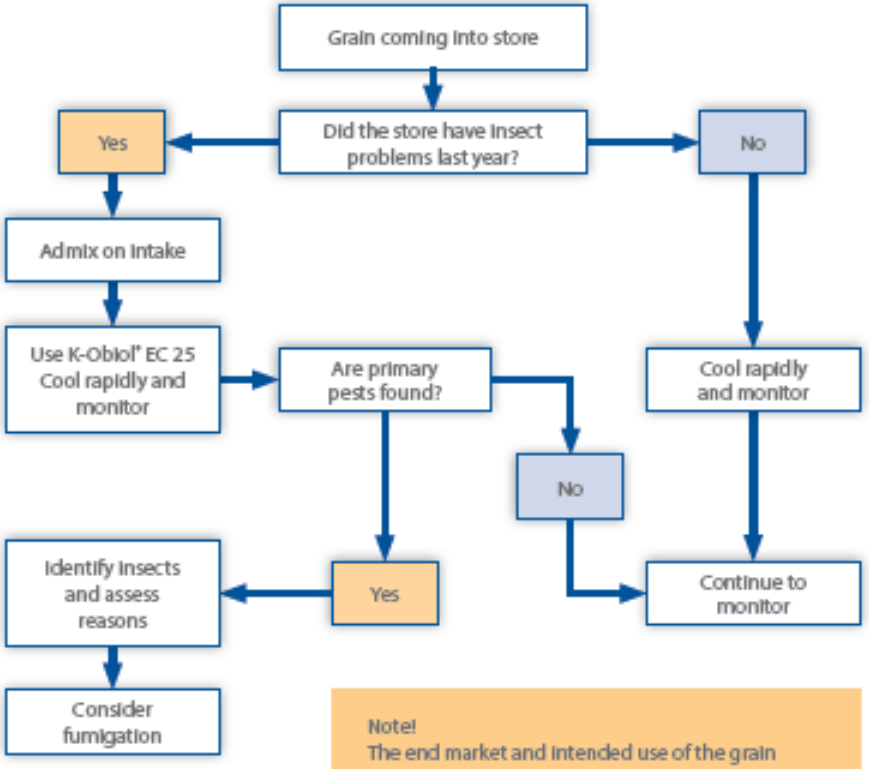
* Fixed by WHO and FAO

When to use K-Obiol?

PRE-HARVEST



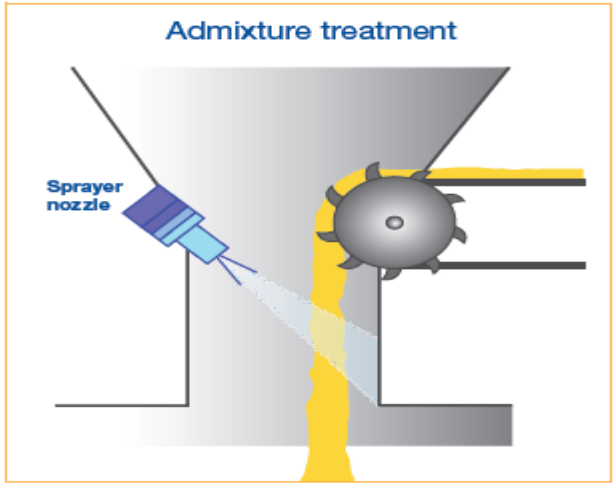
GRAIN STORAGE



Application – on grain

- 600 ml K-Obiol® EC 25 to 10L water for a mixture containing 0,15 % m/v Deltamethrin
  or
  ½ ℓ / per ton

- **Calibrate** for 0.75 ppm on maize & small grains



The above diagram is for guidance only

German K-Obiol applicator and spray drift arrestor

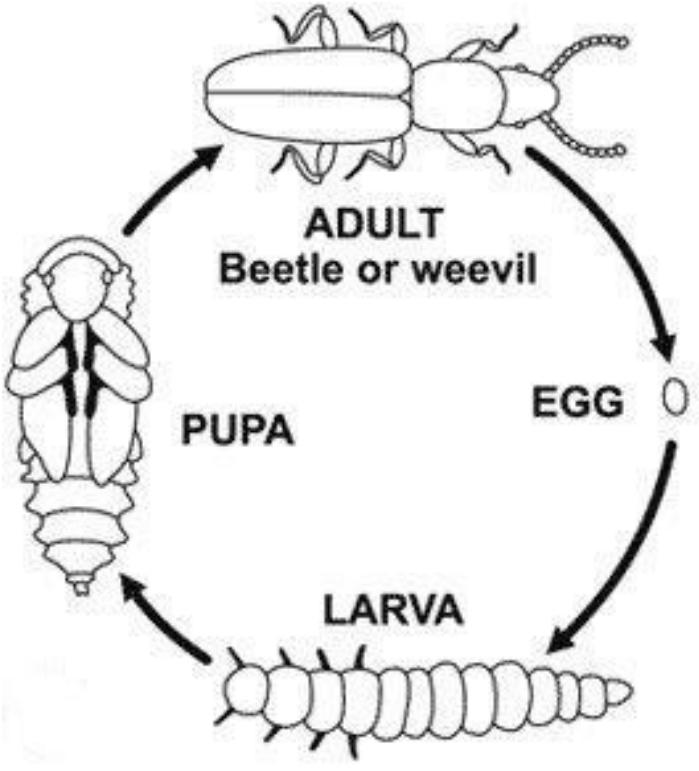
Application – structural treatments

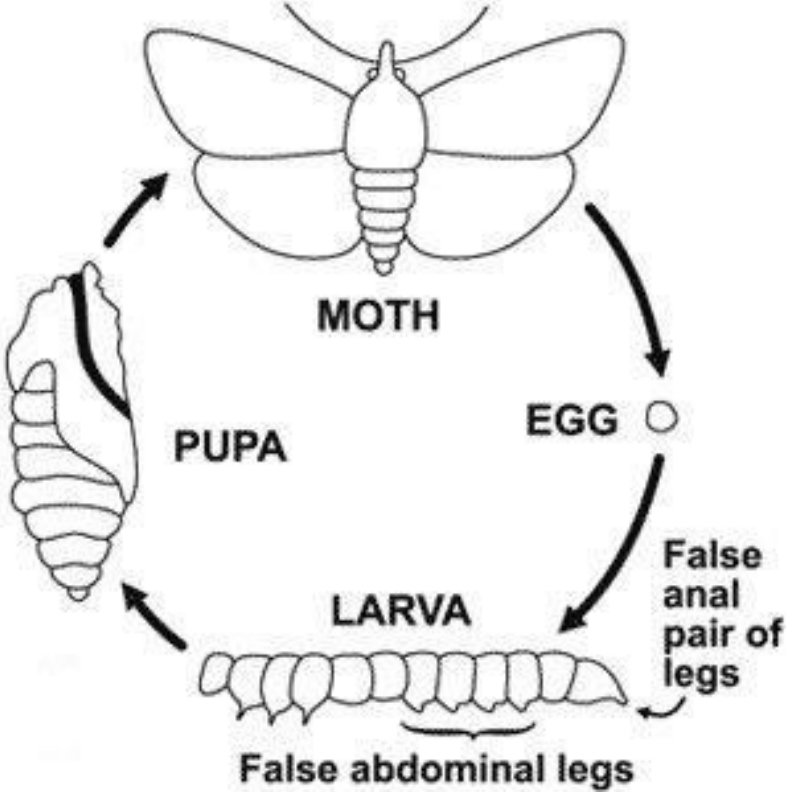
Residual Spray
Dilute 100-120 ml **K-Obiol® EC 25** in 10 l water and apply the mixture to 200 m² surface.

Thermal Fogging
1 ℓ **K-Obiol® EC 25** in 1 ℓ paraffin or diesel.
The mixture is applied at 1 ℓ solution per 4000- 5000 m³.

Some Visuals from RSA

The SPP Profile and life-cycles





Mode of action & Efficacy

primary vs secondary pests NB

Pest	Life-cycle (weeks)	Prime Coloniser	Adult - Lifespan (M)	Flight	Cut off temp - °C
Confused flour beetle (*Tribolium confusum*)	3 to 20	2°	?	no	~ 17
Saw-toothed grain beetle (*Oryzaephilus surinamensis*)	3 to 17	2°	7	yes	17.5
Rust-red flour beetle (*Tribolium castaneum)*	4 to 11	1°	24	yes	20
Rice weevil (*Sitophilus oryzae*)	4 to 36	1°	2 to 3	climb	<14
Granary weevil (*Sitophilus granarius*)	4 to 21	1°	7 to 8	no	<14
Maize weevil (*Sitophilus zeamais)*	5 to	1°	5 to 12	yes	<12
Flat grain beetle (*Cryptolestes* spp.)	4 to 13	2°	3 to 6 (18)	yes +	17.5
Lesser Grain Borer (*Rhyzopertha dominica*)	4 to 7	1°	2 to 3	strong	18
Larger Grain Borer *(Prostephanus truncatus)*	4 to 5	1°	1.5 to 2	strong-	?
Tobacco Beetle (*Lasioderma serricorne*)	3.7 to 17	1° - 2°	0.25 to 1	strong	17

Resistance management

In any given **population** there will be **individual** variances

Some of the variances my confer tolerance to the chemicals being used

Constant use of the chemicals will result in the selection of **tolerant individuals** which will survive, multiply and **change the population profile**.

Management of resistance comprises

Good Housekeeping on site

Awareness of **imported** pests

Monitoring contaminant invasion, Bio-security and on site infestation

Strategic use of alternative chemical groups and methods. IPM

Global Table of the common Grain Protectants

Active ingredient	Deltamethrin	Malathion	Pyrimiphos - methyl	Cholrpyriphos-méthyl	Bifenthrine + Malathion	DDVP
Family	Pyrethroid	Organo-phosphorous	Organo-phosphorous	Organo-phosphorous	Pyrethroid / Organo-phosphorous	Organo-phosphorous
Action mode	Contact ingestion	Contact ingestion	Contact ingestion	Contact ingestion	Contact inhalation	Contact inhalation
Protection	6 – 12 months	1 – 2 months	6 months	6 months	6 – 12 months	2 - 14 days
Thermal sensitivity	No	Yes	Yes	Yes	Yes	Yes
Wet sensitivity	No	Yes	No	No	Yes	Yes
Application rate (mg/kg)	0.25 to 1-2	8	4	2.5	0.3 & 6	5
Cereal MRL (mg/kg)	1	8	5	3	0.5 & 8	
ADI (mg/kg/day)	0.01	0.3	0.03	0.01	0.02 & 0.3	0.004

Science For A Better Life

Thank you!