

Preventing slug damage in iceberg lettuce heads using slug parasitic nematodes

Albert Ester & Klaas van Rozen

4th International Symposium "Entomopathogenic Nematodes and Symbiotic Bacteria"

1-6 June 2006



Presentation contents

- Damage in practice
- Slug control in The Netherlands
- Research with Nemaslug
- Advantages of nematode application



Slug damage to lettuce



Soil structure and previous crops

- Slugs mainly active on heavy soil types!
- Arable crops:
 - Cereals
 - Oilseed rape
 - White mustard
- Vegetables
 - Brussels sprouts
 - Leaf vegetables



Slug control in The Netherlands

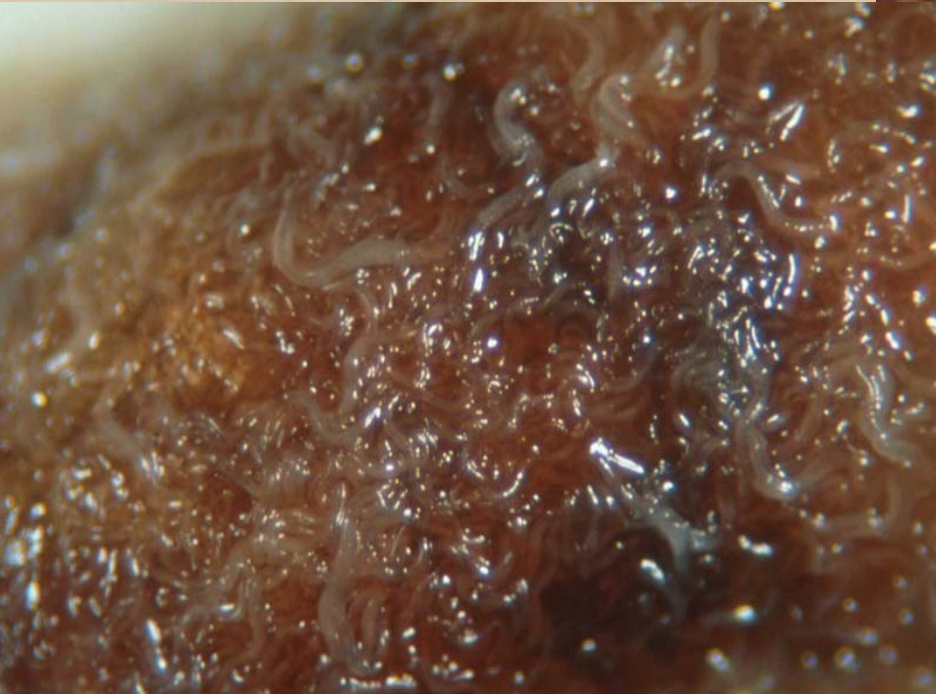
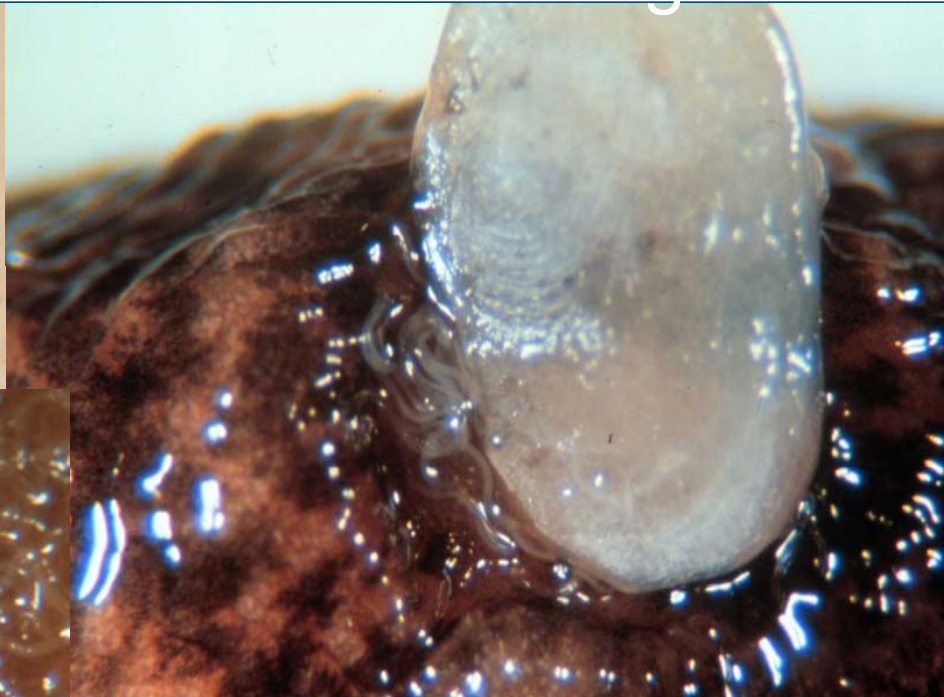
Currently available products in The Netherlands

- Metaldehyde pellets, at 7 kg/ha
 - Only allowed from 1 March to 1 September
- Ferramol pellets (1% ferric phosphate), at 25-50 kg/ha
- Nemaslug (*Phasmarhabditis hermaphrodita*), application rate depending of crop



Phasmarhabditis hermaphrodita nematodes against

slugs



Semi-field trial with slugs in iceberg lettuce,



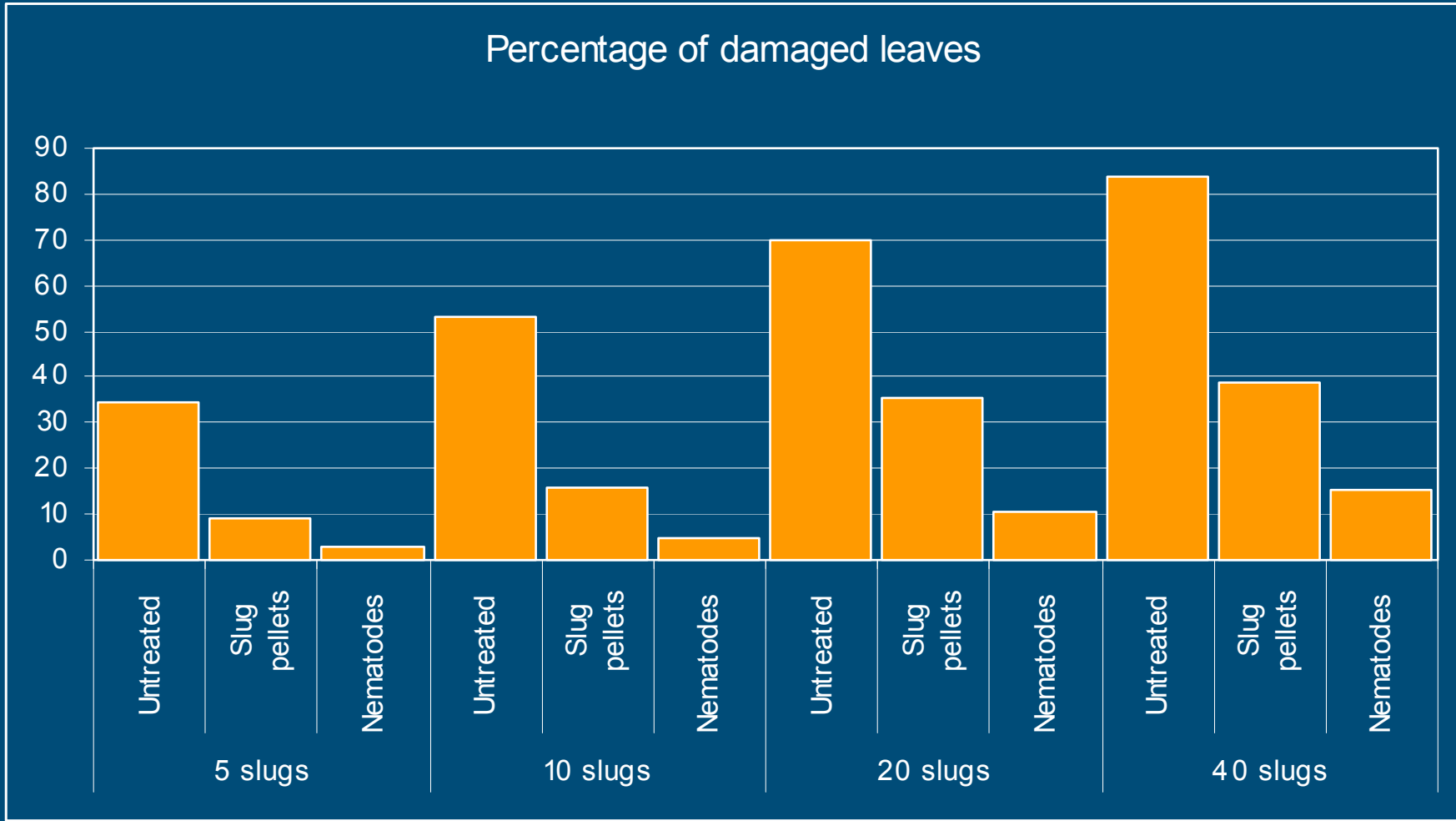
Trial data

- Plot size : 1 m²
- # plants per plot : 16
- Slug species : *Deroceras reticulatum*
- Nematode application : Knapsack sprayer
 - Nozzle type : Teejet XR8006
 - Amount of water: 300 l/ha
- Pellet application : by hand



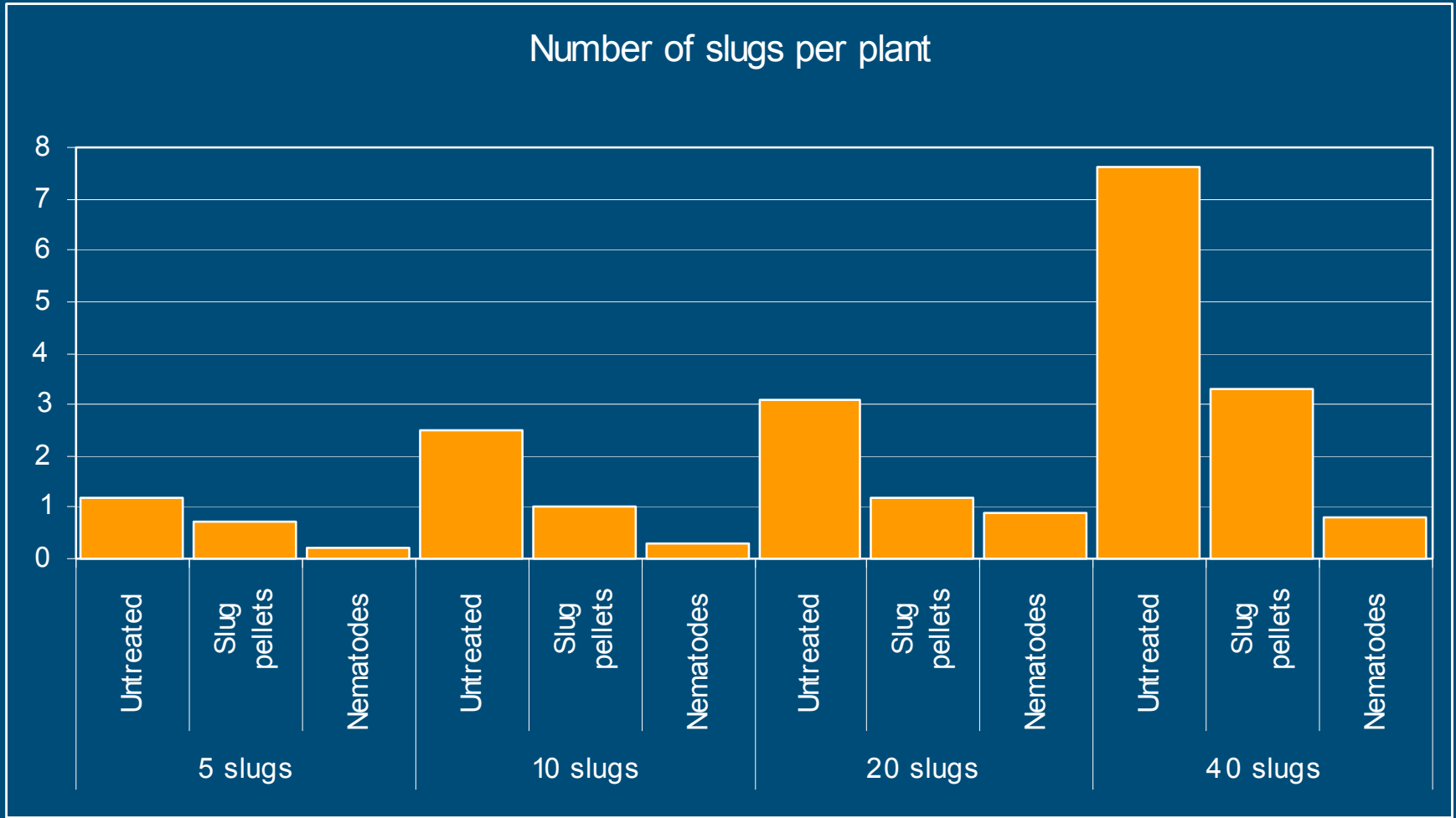
Slug damage – varying slug numbers

spring 2003



Slug damage – varying slug numbers

spring 2003



Slug damage – percentage attacked leaves

After 14 days, summer 2003

Treatment	Dose per m ²	Number of replicates	Feeding damage
Untreated	0	4	6.8 B
Slug pellets	0.7 g	4	2.4 A
Nematodes	300,000	8	0.5 A
Nematodes	100,000	8	0.1 A
Nematodes	50,000	8	1.8 A



Slug damage – slugs inside heads and per plant

Treatment	Dose per m ²	Inside head	Per plant
Untreated	0	2.3 D	3.0 C
Slug pellets	0.7 g	0.7 AB	1.1 AB
Nematodes	300,000	1.2 BC	2.0 BC
Nematodes (2x)	300,000	0.0 A	0.1 A
Nematodes	100,000 (2x)	0.4 AB	0.8 AB
Nematodes (2x)	100,000	0.1 A	0.2 A
Nematodes	50,000 (2x)	2.1 CD	3.0 C
Nematodes (2x)	50,000 (2x)	0.4 AB	0.5 A



Nemaslug vs. slug pellets

Advantages in iceberg lettuce

- Protection of the head against slugs – slug pellets not accepted in the harvested product.
- Nematodes actively searching for slugs both on soil surface and in topsoil – slug pellets only present on soil surface.
- Nemaslug is available during the whole growing season – metaldehyde slug pellets only allowed until 1 September.



Conclusion

Biological control of slugs in iceberg lettuce crops
by use of Nemaslug has sufficient effect
and is not expensive

