

Nursery stock research topics

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Contents

- Fertilization
- Innovation
- Type of research
- Green city concept



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Fertilization

Nitrate Directive

- $< 50 \text{ mg NO}_3/\text{l}$ groundwater

Sandy soils with deep groundwater

$\text{N surplus} = \text{N supply} - \text{N export} < 76 \text{ kg NO}_3/\text{ha}$

N application standards depend: crop and soil type

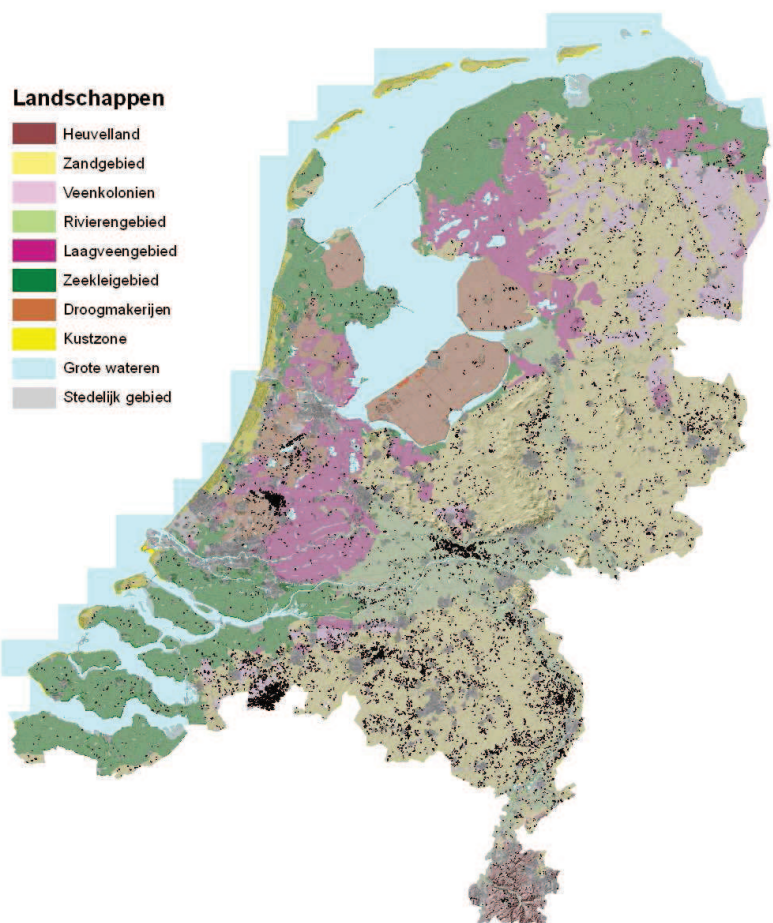
Perennials 175 kg N/ha – shrubs / conifers 85 kg N/ha



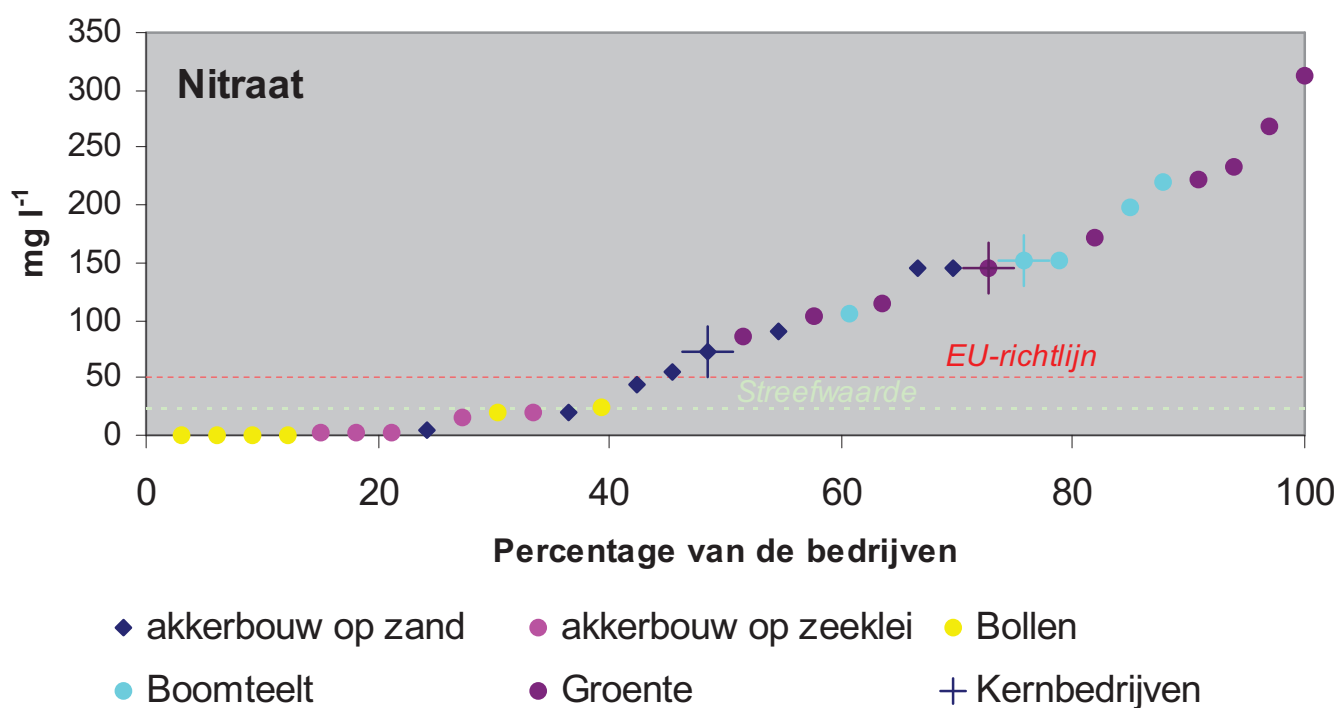
Soils

Sandy soils important for production of

- Perennials
- Street trees
- Forest & hedge plants
- Fruit trees
- Buxus
- Conifers



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Fertilization

- Water Framework Directive

Now 1 standard application rate: 85 kg P_2O_5 /ha

2015: 50 – 75 kg P_2O_5 /ha depending on the P status

Many P saturated soils

Maintaining Soil Organic Matter content



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Soil health

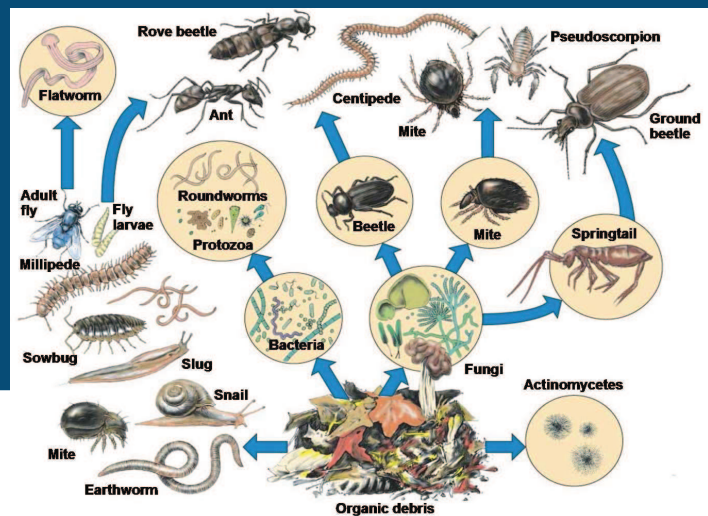
- Coastal area important for flowerbulbs and perennials

Experiment

Crop rotation – 1: 4 → 1 : 8

SOM content – 0.6; 1.2; 4 %

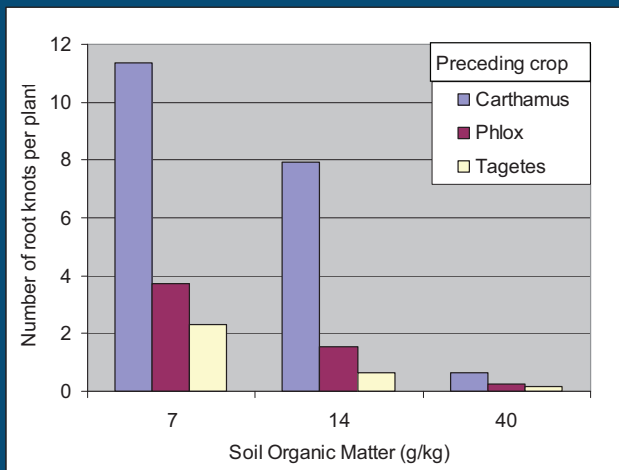
Effect on soil health
tested in bioassays



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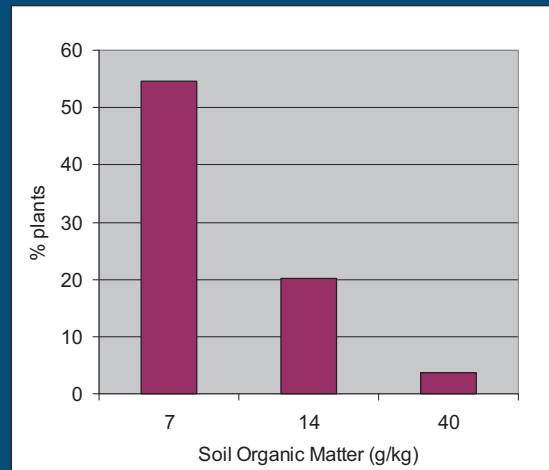
Soil health

Bioassay



Number of root knots (*M. hapla*) in *Lactuca sativa*.

Field experiment



Yield data: % *Aconitum* plants with root knots (*M. hapla*)



Innovation



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Co - Innovation

We did a test

Growers invested much €S — Now close cooperation in an on-farm experiment

Advantages

- Quality of the product
- Labour
- Closed systems, no leaching
- Limited use of herbicides
- Independent of soil conditions
- ...



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Type of research

Shift from on – station → on – farm

Reasons

- Costs
- Impact

Of course limitations but also many advantages



Type of research

- Groups of farmers/growers
 - Separate groups for main subsectors
 - One grower central role; others discussion board
- Activities
 - On farm research and demonstration
 - Network building: Contacts and discussion with
 - Growers organisations
 - Suppliers
 - District water board
 - Local and regional government



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Telen met toekomst

Type of research

Organic nursery stock

- Extent still limited
- Government stimulates research – ‘nursery’
 - Mechanical weed control
 - Biological pest control
- Growers are directing research





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The overall aim of the Green City concept

To improve the livability of urban surroundings and
to benefit the well-being of citizens living there



Green – A multifunctional product

- Green and health
- Green and social harmony
- Green and economy
- Green and environment



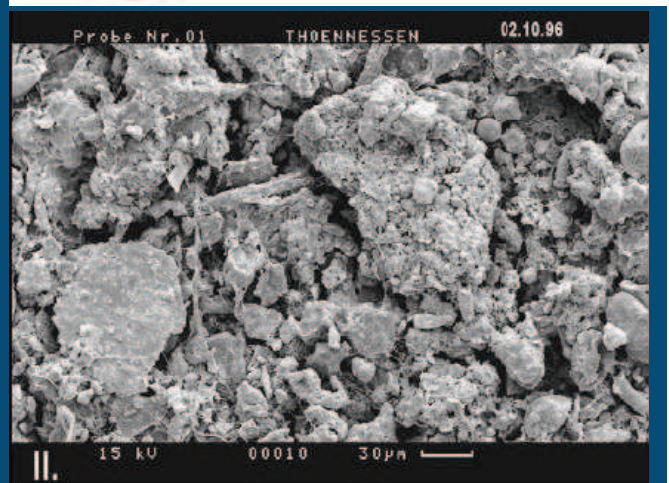
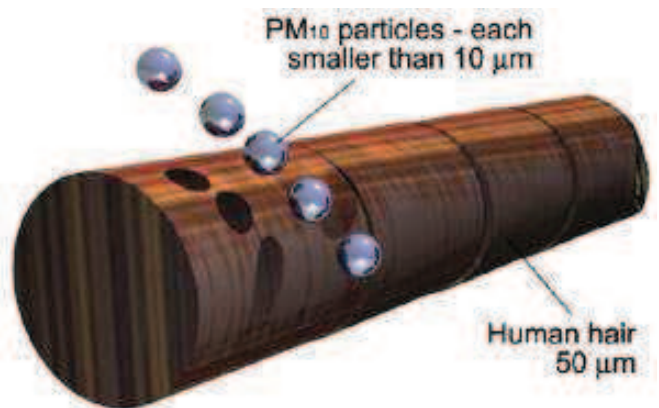


Air quality

At present!

- PM10
- Nitrogen oxides (NO_x)
- Ozone (O_3)

- In the near future!
- PM2.5



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Air cleaning effect of plant species

- 130 species
- Classification based on plant characteristics and expert judgement

			PM	NOx
Scientific name	English name	Main Group		
Acacia auriculiformis	Black Wattle	Tree	++	+++
Acalypha hispida	Red Hot Cat's Tail	Shrub	+	++
Acalypha wilkesiana	Painted copper leaf	Shrub	+	++
Adenium obesum	Mock Azalea	Shrub	+	+
Allamanda cathartica	Yellow allamanda	Shrub / Climber	+	+++
Alstonia scholaris	Devil tree	Tree	+	++++
Antigonon leptopus	Mexican creeper	Climber	+	++
Araucaria heterophylla	Norfolk Island pine	Tree-Conifer	++++	++
Arctocarpus heterophyllus	Jackfruit	Tree	+	++++



Design and air quality

- Identification of main source of pollution
- What do people like
- Ecological conditions
- Right plant on the right place


Urban tree air quality score

To rank the ability of the different tree species to affect air quality, we compared the concentrations of pollutants with each new tree population against those produced by the current one. We used a simple equation that takes into account the effect of changing tree species on pollutant formation and deposition, using ozone to represent all the relevant pollutants. The change in ozone concentration with each tree population was compared to the air quality standard for ozone* to estimate the significance of the change.

$$UTQAS = \frac{\text{Change in ozone concentration}}{\text{Air Quality Standard for ozone}}$$

We grouped the tree species according to their effect on air quality. They are grouped below as

- trees that have the greatest capacity to improve air quality
- trees that have a smaller capacity to improve air quality
- trees that have the potential to worsen air quality

Best  Worst

Ash	Apple	Holly	
Common elder	Cherry laurel	Italian alder	
Field maple	Common elm	Lawson cypress	
Larch	Common lime	Leyland cypress	
Norway maple	Elder	Lilac	
Scots pine	Grey alder	Mountain ash	
Silver birch	Hawthorn	Sycamore	
	Hazel	Wild cherry	
			Crack willow
			English oak
			Goat willow
			Poplar
			Red oak
			Sessile oak
			White willow

* The air quality standard for ozone in the UK is an 8-hour running mean of 50 ppb not to be exceeded on more than 10 days in one year. This is set as part of the government's National Air Quality Strategy. Details are found at www.aeat.co.uk/netcen/airqual/index.html.

Thank you for your attention

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