Variable rate application of pesticides in potato and tulip

Corné Kempenaar, Vincent Achten, Frits van Evert,
Arie van der Lans, Ard Nieuwenhuizen, David van der Schans,
Ben Verwijs, Jan van de Zande

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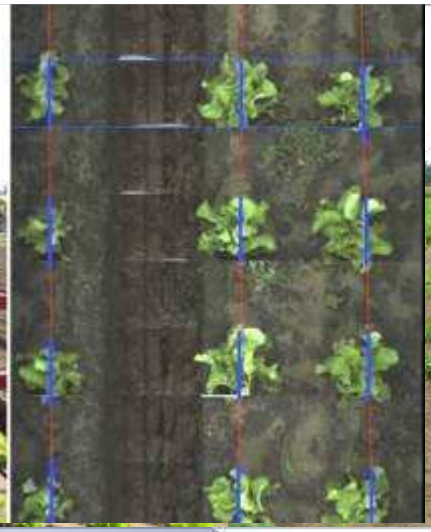
3e Conf. PCP, Bonn, Sept 2010

Outline of presentation

- Introduction
- Results of R&D on VRA in potato and tulip
  - Potato haulm killing herbicides
  - Fungicide use
- Conclusions

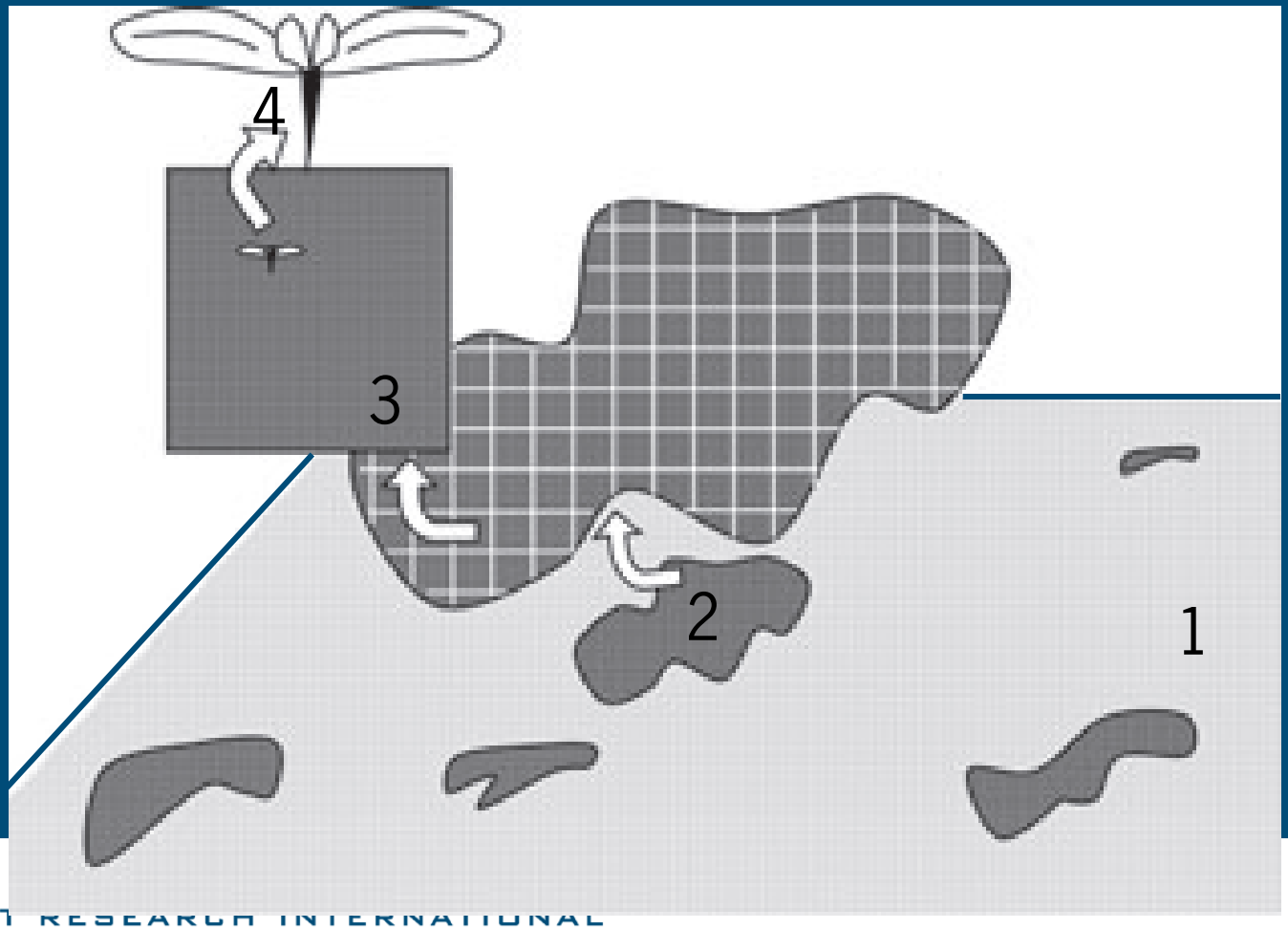









Scales and precision, after Christensen et al., 2009 : from uniform (1) treatment to spot (2), grid (3) and plant (4) treatment



Variable rate application and at resolution scale 10 – 30 m^2 using canopy reflection data (canopy density spraying)

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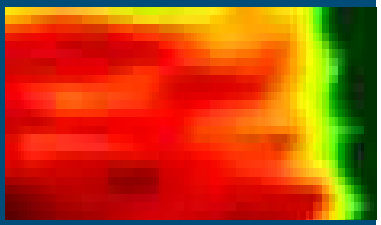
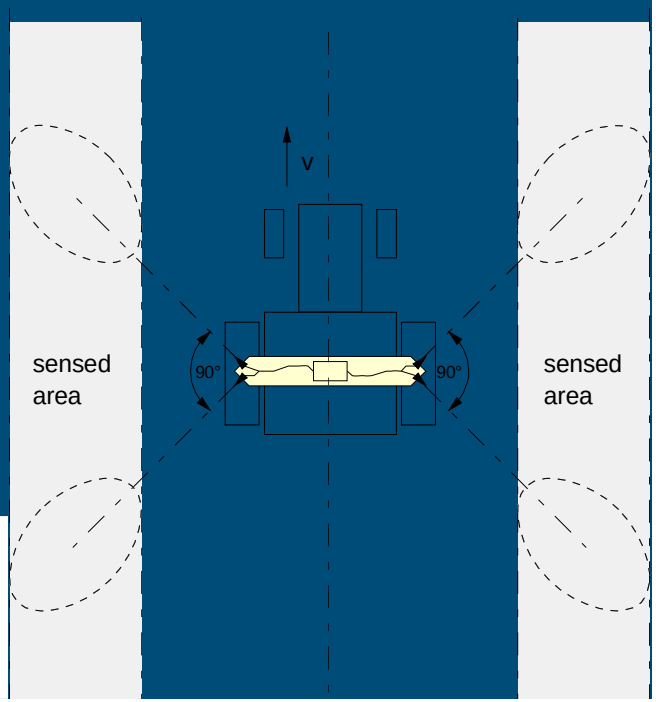
CDS -VRA in arable crops

- Management activities / inputs
  - Potato haulm killing herbicides (also called desiccants or vine killers)
  - Contact fungicides
  - Growth regulators
  - Fertilizers
- Technologies available
  - Crop reflection sensors (Yara N-Sensor, Greenseeker, Crop circle on the ‘ground' or remote satellite of UAV images, ….)
  - Dosing algorithms (available for some activities)
  - Conventional sprayers, injection sprayers, SensiSpray, …..

CDS and VRA



- Spatial variation in crop biomass and activity can be measured with light reflection sensors (ground and remote sensing)



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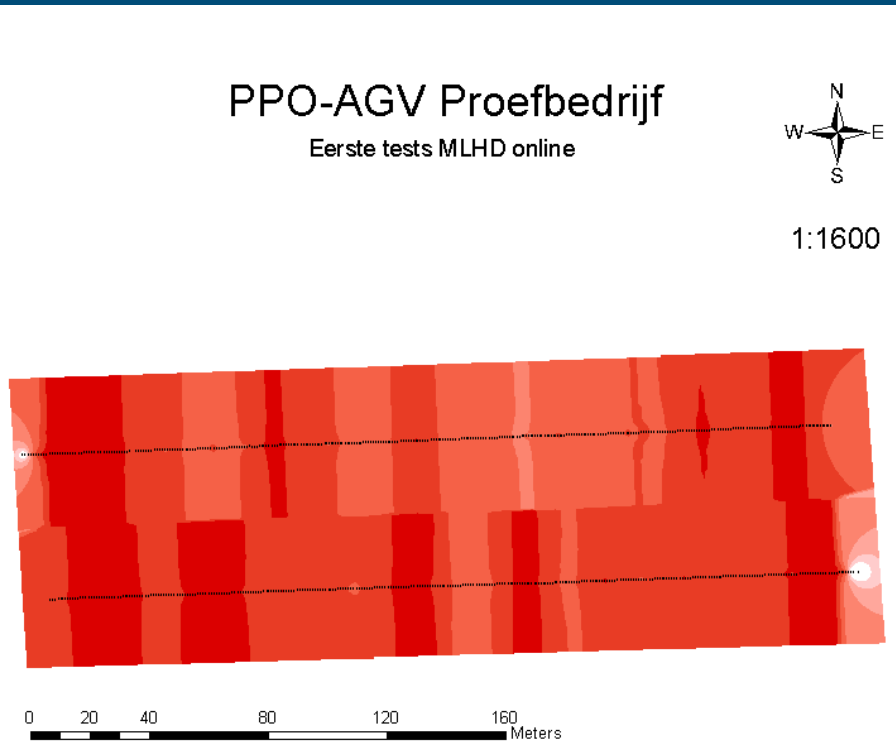
First prototype for CDS - VRA resol. 10 – 30 m^2 (2005)

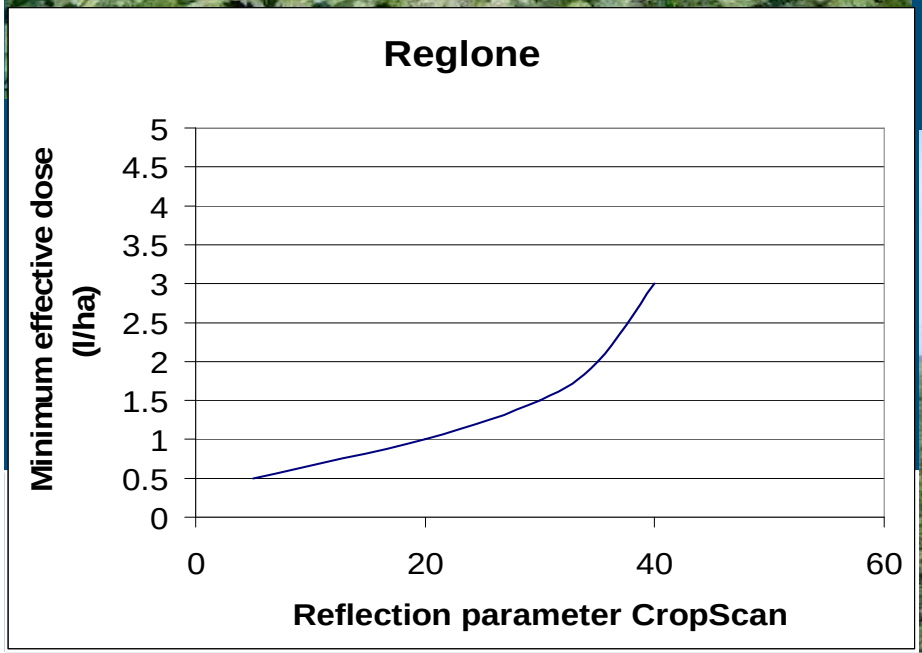
Yara crop reflection meter (N-sensor) on top

Injection sprayer

MLHD DSS with dosing algorithms PHKH

Spray map (2005)





Results AgriCon, Leipzig, Germany 2009

- Yara N-Sensor plus conventional sprayer
- MLHD PHK dosing algorithm Reglone, normal, 1x
- Ware potatoes BBCH GS 91, 7 august, sunny, hot (30 °C)
- Pictures were taken four days after treatment

Fixed rate: 2,5 L Reglone/ha @ 300 L water per ha

Variabele rate: av. 1,5 L Reglone/ha @ 200 L water per ha

What decisions has the farmer to make?

- Herbicide (3 - 5 options in MLHD PHK module)
- One treatment or split application
- Normal or ‘high risk’ situation
  - Crop variety properties (species with thick stems)
  - Phytophthora infestans infections present
  - (Late) weed infestation in the crop

MLHD-PHK

SensiSpray, VRA per section of spray boom

Results in potato haulm killing (2006 – 2009)

- Reduction of 50% in potato haulm killing herbicide use compared to standard practice, while efficacy remained good and no hampering of harvest was observed
- Today 10 farmers within the EU use the MLHD-PHK technology in practice

- More uses are required to make the investment in hardware economic

CDS in late blight control in 2009 and 2010

- Potato fields in Lelystad
- Timing of Shirlan of Revus fungicide appl. with ProPhy DSS
- 20-30 % reduction in fungicide use

Dosing of Revus in 2010 in time with SensiSpray

8/6 Variabel: 0,23 L/ha
Constant: 0,5 L/ha

8/7 Variabel: 0,4 L/ha
Constant: 0,5 L/ha

14/6 Variabel: 0,47 L/ha
Constant: 0,6 L/ha

30/6 Variabel: 0,42 L/ha
Constant: 0,5 L/ha

21/6 Variabel: 0,39 L/ha
Constant: 0,5 L/ha

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CDS in Botrytis control in tulip (2009)

- Similar set up as in potato
- 50 % reduction in fungicide use

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Conclusions CDS VRA at scale 10 – 30 m^2

- The prototypes for CDS VRA performed well
  - Technologies are available
  - Best results with ground sensors (so far)
- Herbicide reduction (potato haulm killing herbicides) was 50 % (12 – 70 %) compared to standard practice while efficacy and quality remained good (2006 -2009)
- Fungicide use in potato and tulip was reduced by 20 – 50 %, while efficacy remained good (2009 and 2010)
- More uses are possible at arable farms (fertilizer use, etc.)

Thank you for your attention

Info: www.mlhd.nl, www.geo-logisch.nl
www.sensoroffice.com, www.precisielandbouw.eu

Questions: corne.kempenaar@wur.nl

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