Inter-row cultivation for mechanical weed control in winter oilseed rape

WP2, Innovative IPM solutions for winter wheat based rotations
Motivations for employing mechanical weed control

Non-chemical weed management tactics are important for implementing the intentions of IPM crop protection programmes in arable crops.

Mechanical weed control methods lead to less reliance on herbicides and reduce adverse side-effects from herbicide use.

Inter-row cultivation has shown promise for non-chemical weed control in winter oilseed rape.
Principal weed species causing problems in winter oilseed rape in Northern Europe

- Poa annua
- Stellaria media
- Papaver rhoeas
- Veronica persica
- Volunteer cereals
- Tripleurospermum perforatum
- Thlaspi arvense
- Sinapis arvensis
- Capsella bursa-pastoris
- Lamium purpureum
Inter-row cultivation requires increased row spacing, preferably 50 cm

Normal row spacing 12.5 cm. (14 October 2011)

Increased row spacing 50 cm. (14 October 2011)

Inter-row hoeing in April 2014
The implement for inter-row cultivation

Inter-row hoeing in September at an early crop growth stage (oilseed rape with 2-3 true leaves)

Inter-row hoeing in late April using a front-mounted hoe for manual steering

Videoclip of inter-row hoeing in September in the PURE-experiment at Flakkebjerg
Links to examples of inter-row hoes relevant for inter-row cultivation in winter oilseed rape

Inter-row cultivators with goosefoot shares (blades) including examples of camera-based automatic steering systems:

http://www.kongskilde.com/Agriculture/Soil/Weed%20Control


http://garford.com/products_robocrop.html

http://www.steketee.com/category/Mechanische-onkruidbestrijding
Weeding strategy for inter-row cultivation in winter oilseed rape

Early autumn, first pass at the 2-4 true leaves stage - mandatory. Use protective discs to avoid covering the crop with soil.

Mid-autumn, second pass if necessary. Protective discs may be removed to allow for slight ridging of the crop to suppress intra-row weeds.

Early spring, a third pass might be necessary in case of high weed pressure and mild winters. No need for protective discs.
Vulnerability of weeds to hoeing at different weed growth stages

- **Stellaria media**
  - Easy to control, very limited regrowth

- **Tripleurospermum perforatum**
  - Regrowth may take place under wet weather conditions after treatment

- **Capsella bursa-pastoris**
High pressure from competitive intra-row weeds may require chemical weed control

Weedy crop rows can result in yield losses and considerable weed seed shedding – especially volunteer cereals, *Tripleurospermum perforatum* and *Papaver rhoeas* can be problematic.

Use band-spraying for the control of intra-row weeds in order to minimise herbicide input

Nice and clean crop rows
Conclusion

Inter-row cultivation for mechanical weed control is an important IPM-tool for winter oilseed rape and can in many case provide sufficient weed control. Supplementary intra-row control with herbicides may be required where competitive weeds and volunteers with an erect growth habit occur in high numbers.

Inter-row cultivated oilseed rape on 16 April 2014 – a perfect crop!

Effects of inter-row cultivation in winter oilseed rape, IM = intermediate cropping system, AV = advanced cropping system.

The PURE experiment at Flakkebjerg (DK)