

Novel approaches to weed control in commercial fruit production

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- Background
- Electrical weeding
 SCEPTRE trials
- Hot foam trials
 - Opportunities in horticulture
- HDC/EMT/HTA Fellowship cover crops and living mulches





Background

- Loss of actives 91/414/EEC
- Future threats to actives under 09/1107/EEC, Sustainable use directive & endocrine disruptor definition
- Need for food security weeds reduce productivity
- Pressure from retailers for reduced pesticide use
- No herbicide options in certain situations
- Opportunity from new technologies





SCEPTRE electrical weeding

Blackcurrants









SCEPTRE - Sustainable Crop & Environmental Protection -Targeted Research for Edibles

- Gap-filling
- Identifying effective & crop safe actives
- Investigating sustainable IPM systems



Department for Environment Food & Rural Affairs













2-4 weeks post treatment



Symptoms on blackcurrant leaf- 5 second treatment



Nettle regrowth







Electrical weeder with bush fruit treatment arm attached - 2014

- 3 voltages
- Assessments 1, 3 & 6 WAT
- Bushes monitored for crop safety







Blackcurrant damage: 2 WAT



Damage on branches where probe touched

Branch damage - bush ok





Conclusions – Electric weeder

- Creeping thistle excellent control
- Potential with nettle and dock re-growth seen
- Some phytotoxicity further investigation, timing
- Needs further investigation
 - Modified equipment
 - Yield assessments
 - Forward speed improvement
- Valuable future method potential





and states

Strawberries







Investigating the potential uses of hot foam in commercial horticulture

- Strawberry weed and runner control inter-row
- Host growers consulted on where this technology maybe of most use in their sector
- Applications were applied July 2013
- Trials were assessed 1, 2 and 4 weeks after treatment (WAT)





2 year old beds with runners













Foam weeding conclusions

- Impressive spectrum of weed control up to 4 weeks
- Re-treatment would be required
- Speed of treatment a concern
- Hand held equipment well suited to amenity, tractor trailed system in development
- Immediately safe after application, no PPE required
- Growers interested in the technology
- Potential to control seed, fungal spores, bacterium?





Understory living mulches

Apple - Weeds Fellowship Project



Trial objectives

Investigate the potential advantages of sowing living mulches in an apple orchard assessing the following aspects:



- Weed suppression
- Effects on the crop nutrient status and soil moisture



Species investigated



Black medic



Birdsfoot trefoil



Red fescue



Birdsfoot trefoil + red fescue



Methods

- November 2013 Existing herbicide strip shallowly cultivated
- Seeds sown Autumn and again in spring
- Assessed through the season
 - Living mulch & weed cover
 - Soil NPK
 - Soil moisture
 - Apple yield and diameter
 - Extension growth
 - Leaf nutrient content





August 2014







2014 results





2014 results

Soil moisture: P value: 0.015 LSD (18 df): 5.92 Fruit weight: Not significant







Creeping red

fescue

Mulch cover

mulch cover

Clover

trefoil

Birdsfoot

Black medic

treion lescue + Birdsfoot trefoil

Preliminary Conclusions

- All living mulches successfully supress weeds
- Creeping red fescue (*Festuca rubra*) is most suppressive, but also appears to be most competitive

Future investigations:

- Look to how living mulches could be managed to decrease competition and enhance natural enemies and pollination:
- Timing of mowing
- Spraying off mulches temporarily at critical periods
- Investigate use of different and more dwarfing species





Use of cover crops pre planting

Blackcurrant





Objective and methods

To compare cover crop sowing mixes for perennial weed control prior to blackcurrant planting

Treatment	Sowing density
Untreated control	-
Buckwheat cv. KORA	100 kg/ha
Rye grass + red clover mix	35 kg/ha + 15 kg/ha
Creeping red fescue + Black medic mix	75kg/ha + 8kg/ha
Maize game cover – grower control	Grower's rate



Results – November 2014











Summary

- Exciting opportunities for non-chemical weed control in fruit crops
- Loss of actives and herbicide restrictions pushing the need for such alternative options
- Integrated weed management would be enhanced by the inclusion of these novel technologies





Thank you

