Weed Management Decision-Making among Organic Field Crop and Livestock Producers in the Northwestern U.S.

Nicole E. Tautges[1], Jessica R. Goldberger[1], Ian C. Burke[1]

[1]Department of Crop and Soil Sciences, Washington State University, Pullman, WA, USA

INTRODUCTION

- Organic growers in the Northwestern U.S. (NW) report dissatisfaction with the lack of information available on organic farming.[1]
- Weed control remains one of the primary factors limiting adoption of organic practices and one of the major challenges for organic growers.[1,2]
- Little information regarding weed management on organic grains farms was collected in previous surveys.
- Knowing current practices can help in developing organic weed management programs for growers in the NW.

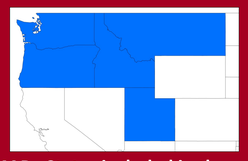
Organic spring wheat with poor weed control (left) and with good weed control (right).

SURVEY OBJECTIVES

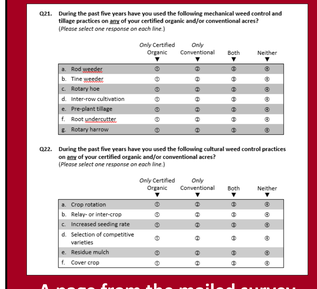
1) Identify weed control practices currently being used on organic field crop and livestock farms
2) Identify problematic weeds on organic farms
3) Develop research and Extension goals to help organic growers in the NW build weed management programs

METHODS

- All certified organic field crop and livestock producers in ID, MT, OR, UT, and WA were sent surveys using list obtained from USDA



MAP: States included in the survey are highlighted in blue.



Q21. During the past five years have you used the following mechanical weed control and tillage practices on any of your certified organic and/or conventional acres? *(Please select one response on each line.)*

	Only Certified Organic	Only Conventional	Both	Neither
a. Rod weeder	①	②	③	④
b. Tine weeder	①	②	③	④
c. Rotary hoe	①	②	③	④
d. Inter-row cultivation	①	②	③	④
e. Pre-plant tillage	①	②	③	④
f. Root undercutter	①	②	③	④
g. Rotary harrow	①	②	③	④

Q22. During the past five years have you used the following cultural weed control practices on any of your certified organic and/or conventional acres? *(Please select one response on each line.)*

	Only Certified Organic	Only Conventional	Both	Neither
a. Crop rotation	①	②	③	④
b. Relay- or inter-crop	①	②	③	④
c. Increased seeding rate	①	②	③	④
d. Selection of competitive varieties	①	②	③	④
e. Residue mulch	①	②	③	④
f. Cover crop	①	②	③	④

A page from the mailed survey questionnaire

- Growers were asked about their use of 7 mechanical weed controls and 6 cultural weed controls
- Cluster analysis in SPSS was used to group respondents by intensity of weed management program

* = indicates significant difference among groups

RESULTS

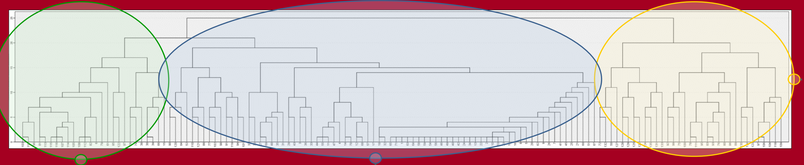


Figure 1. Dendrogram from hierarchical cluster analysis, performed on grower responses to use of mechanical and cultural weed controls. Use was coded as a binary response variable, where "1" = use and "0" = non-use.

LOW MANAGEMENT GROUP
Forage-Only Producers

Alfalfa cut for hay

- Total weed control measures per year: 0-3
- Mechanical controls per year: 0-1
  - — Pre-plant tillage (24%)
- Cultural controls: 0-2
  - — Relied on crop rotation with perennial crops (37%)

OPERATION AND DEMOGRAPHIC CHARACTERISTICS
- Mean Land Area Operated: 880 hectares*
- Mean No. Crops Grown in last five years: 3*
- Mean Age: 58 years*
- Education: 37% completed a college degree*

EXTENSION RECOMMENDATIONS
- *establish contacts*
- *provide information on cultural controls in forages*

MEDIUM MANAGEMENT GROUP
Short-Rotation Forage and Grain Producers

- Total weed control measures per year: 4-7
- Mechanical controls per year: 1-3
  - — Pre-plant tillage (84%)
  - — Tine weeder (29%)
  - — Rod weeder (27%)
- Cultural controls: 3-5
  - — Crop rotation (95%)
  - — Increased seeding rate (72%)
  - — Cover cropping (59%)

Rod weeder

OPERATION AND DEMOGRAPHIC CHARACTERISTICS
- Mean Land Area Operated: 1165 hectares*
- Mean No. Crops Grown in last five years: 5*
- Mean Age: 54 years*
- Education: 48% completed a college degree*

EXTENSION RECOMMENDATIONS
- *improve grain marketing options*
- *increase rotation diversity*
- *discuss increased use of cultural controls*

HIGH MANAGEMENT GROUP
Long-Rotation Forage and Grain Producers

Triticale intercropped with peas

- Total weed control measures per year: 8-13
- Mechanical controls per year: 3-6
  - — Pre-plant tillage (94%)
  - — Tine weeder (65%)
  - — Rod weeder (61%)
  - — Inter-row cultivator (52%)
  - — Root undercutter (45%)
  - — Rotary harrow (45%)
- Cultural controls: 4-6
  - — Crop rotation (100%)
  - — Variety selection (100%)
  - — Cover crops (100%)
  - — Increased seeding rate (97%)
  - — Residue mulch (78%)
  - — Relay- or inter-cropping (48%)

OPERATION AND DEMOGRAPHIC CHARACTERISTICS
- Mean Land Operated: 1890 hectares*
- Mean No. Crops Grown in last five years: 7*
- Mean Age: 51 years*
- Education: 68% completed a college degree*

EXTENSION RECOMMENDATIONS
- *farm tours*
- *participatory research*
- *build grower networks*

PROBLEMATIC WEEDS IDENTIFIED BY SURVEY RESPONDENTS

Canada thistle (*Cirsium arvense*)

Field bindweed (*Convolvulus arvensis*)

Redroot pigweed (*Amaranthus retroflexus*)

CONCLUSIONS

- Many organic field crops growers in the NW U.S. operate diverse weed management programs
- Crops and land area operated is related to weed management
- Outreach and Extension efforts with organic field crops growers should be tailored to the rotation and individual needs of growers

Acknowledgements

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References

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[2] Jones SS, Kidwell KK, Dawson JC, Jussaume RA, Goldberger JR, Krebill-Prather R, Glenna LL. (2006) "Wheat Production in Washington: Summary Report." Washington State University Summary Report CSS Information Series No. 1202-06.