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# Pacific Northwest Cover Crop Selection Tool



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# Acknowledgements

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# Preface

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The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Plant Materials Program has been involved in the evaluation of conservation plants and planting technology for more than 75 years.

For additional information on specific species of plants mentioned in this publication, please see the USDA PLANTS database at: (<http://plants.usda.gov/java/>) or contact the nearest Plant Materials Center or plant materials specialist (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/contact/directory/>) and/or the Land Grant University that serves the state. For specific information on soils and soil health, please see USDA NRCS soils website at: (<http://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/>). Also, see technical resources on the National Plant Materials Program Web site at: (<http://www.plant-materials.nrcs.usda.gov/>).



# Summary

The Pacific Northwest Cover Crop Selection Tool is a guide to help growers and conservation planners in Oregon, Washington, and Idaho select cover crop species adapted to their climate, soils, and intended cover crop purpose. The tool is a Microsoft Access database that can be downloaded from the following website:

[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/plantmaterials/technical/toolsdata/plant/?cid=nr\\_cseprd894840](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/plantmaterials/technical/toolsdata/plant/?cid=nr_cseprd894840)


Users make selections for environmental conditions and intended purpose(s) of the cover crop from the drop down lists provided (Figure 1), and then the tool has the ability to generate four reports to help with the final selection, planning and implementation phases of establishing a cover crop. Examples of the four reports are given in Figures 2-5.

Figure 1. User interface for the Pacific Northwest Cover Crop Selection Tool, showing drop down menus for climatic and soil conditions and intended cover crop purpose(s) on the left, and buttons to generate the various report on the right.

3/30/2016

**Suitable Cover Crop Species and Selected Purpose Rating**

**Precipitation Zone:** Greater than 25 inches      **Soil Drainage Class:** Well drained  
**Planting Season:** Both Cool and Warm Season      **Soil pH Class:** Moderately acidic (pH 5.6 - 6.5)  
**Overwinter:** Yes      **Soil Salinity Class:** Not saline (EC less than 2 mmhos/cm)  
**Hardiness Zone:** 8      **Ponding Class:** Not frequently ponded



Plant Name	Purpose 1: Erosion reduction	Purpose 2: Capture, recycle, redistribute nutrients	Purpose 3: Minimize or reduce soil compaction	Purpose 4: Attract beneficial insects
arugula (5)	Fair	Fair	Fair	Yes
barley, spring	Good	Good	Fair	No
barley, winter	Good	Good	Fair	No
canola/rapeseed, spring (1, 5)	Fair	Good	Good	Yes
canola/rapeseed, winter (1, 5)	Fair	Good	Good	Yes
clover, crimson (4)	Fair	Fair	Fair	Yes
clover, red (3, 4)	Fair	Fair	Fair	Yes
clover, strawberry (4)	Fair	Fair	Fair	Yes
clover, subterranean (4)	Fair	Fair	Fair	No
clover, white (3, 4)	Fair	Fair	Poor	Yes
fava, small seed (4, 6)	Fair	Fair	Good	Yes
fax	Fair	Fair	Poor	Yes
kale (1, 5)	Fair	Good	Good	Yes


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Figure 2. Example of the Cover Crop Selection Tool report showing the ratings (good, fair, and poor) of adapted species for four user-selected purposes. Information is displayed along the top of the report to show the user-selected precipitation zone, planting season, overwintering, USDA Plant Hardiness Zone, soil drainage class, soil pH class, soil salinity class, and ponding class of the field where the cover crop will be planted.

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**Suitable Cover Crop Species and All Purpose Ratings**

**Precipitation Zone:** Greater than 25 inches      **Soil Drainage Class:** Well drained  
**Planting Season:** Both Cool and Warm Season      **Soil pH Class:** Moderately acidic (pH 5.6 - 6.5)  
**Overwinter:** Yes      **Soil Salinity Class:** Not saline (EC less than 2 mmhos/cm)  
**Hardiness Zone:** 8      **Ponding Class:** Not frequently ponded




Plant Name	Erosion reduction	Increase organic matter	Capture, recycle, redistribute nutrients	Promote nitrogen fixation	Suppress weeds	Suppress soil-borne pests	Provide supplemental hay	Provide supplemental grazing	Minimize or reduce soil compaction	Attract beneficial insects
arugula (5)	Fair	Fair	Fair	Poor	Good	Good	Poor	Poor	Fair	Yes
barley, spring	Good	Good	Good	Poor	Good	Poor	Fair	Fair	Fair	No
barley, winter	Good	Good	Good	Poor	Good	Poor	Fair	Fair	Fair	No
beet, red	Poor	Poor	Good	Poor	Fair	Poor	Poor	Fair	Good	No
beet, sugar	Poor	Poor	Good	Poor	Fair	Poor	Poor	Good	Good	No
canola/rapeseed, spring (1, 5)	Fair	Fair	Good	Poor	Good	Good	Fair	Fair	Good	Yes
canola/rapeseed, winter (1, 5)	Fair	Fair	Good	Poor	Good	Good	Fair	Fair	Good	Yes
clover, berseem (4)	Poor	Poor	Fair	Good	Fair	Poor	Fair	Good	Fair	Yes
clover, crimson (4)	Fair	Fair	Fair	Good	Fair	Poor	Fair	Good	Fair	Yes
clover, red (3, 4)	Fair	Fair	Fair	Good	Good	Poor	Fair	Good	Fair	Yes
clover, strawberry (4)	Fair	Fair	Fair	Good	Good	Poor	Fair	Good	Fair	Yes
clover, subterranean (4)	Fair	Fair	Fair	Good	Good	Poor	Fair	Good	Fair	No
clover, white (3, 4)	Fair	Fair	Fair	Good	Fair	Poor	Fair	Good	Poor	Yes

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Figure 3. Example of the Cover Crop Selection Tool report showing ratings of adapted species for all possible purposes.

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**Suitable Cover Crop Species and Properties**


Precipitation Zone: Greater than 25 inches      Soil Drainage Class: Well drained  
 Planting Season: Both Cool and Warm Season      Soil pH Class: Moderately acidic (pH 5.5 - 6.5)  
 Overwinter: Yes      Soil Salinity Class: Not saline (EC less than 2 mmhos/cm)  
 Hardiness Zone: 8      Ponding Class: Not frequently ponded

Plant Name	Crop Type	Root Type	Plant Duration	C : N Ratio	Water Use
arugula (5)	broadleaf	taproot	Annual	low	medium
barley, spring	grass	fibrous root	Annual	high	medium
barley, winter	grass	fibrous root	Annual	high	medium
canola/rapeseed, spring (1, 5)	broadleaf	taproot	Annual	low	medium
canola/rapeseed, winter (1, 5)	broadleaf	taproot	Annual	low	medium
clover, crimson (4)	legume	taproot	Annual	low	medium
clover, red (3, 4)	legume	taproot	Biennial/Perennial	low	medium
clover, strawberry (4)	legume	rhizomatous	Perennial	low	high
clover, subterranean (4)	legume	rhizomatous	Annual	low	high
clover, white (3, 4)	legume	rhizomatous	Perennial	low	high
fava, small seed (4, 6)	legume	taproot	Annual	medium	medium
flax	broadleaf	taproot	Annual	high	medium
kale (1, 5)	broadleaf	taproot	Annual/Biennial	low	high
mustards (1, 5)	broadleaf	taproot	Annual/Biennial	low	high

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Figure 4. Example of the Cover Crop Selection Tool report showing the properties of adapted species, including crop type (grass, legume, or broadleaf), root type (taproot, fibrous, or rhizomatous), plant duration (annual or perennial), carbon to nitrogen ratio (low, medium, or high), and water use (low, medium, or high).

3/30/2016



**Suitable Cover Crop Species and Seeding Information**

Precipitation Zone: Greater than 25 inches      Soil Drainage Class: Well drained  
 Planting Season: Both Cool and Warm Season      Soil pH Class: Moderately acidic (pH 5.5 - 6.5)  
 Overwinter: Yes      Soil Salinity Class: Not saline (EC less than 2 mmhos/cm)  
 Hardiness Zone: 8      Ponding Class: Not frequently ponded

Plant Name	Seeds per pound	Seeding depth - min (in)	Seeding depth - max (in)	Drilled Single Species Seeding Minimum	Drilled Single Species Seeding Rate - lb/ac Maximum
arugula (5)	280,000	0.25	0.5	4	6
barley, spring	13,600	1	2	50	100
barley, winter	12,800	1	2	50	100
canola/rapeseed, spring (1, 5)	125,000	0.25	0.5	3	16
canola/rapeseed, winter (1, 5)	125,000	0.25	0.5	3	16
clover, crimson (4)	130,000	0.25	0.5	15	20
clover, red (3, 4)	272,200	0.25	0.5	4	10
clover, strawberry (4)	288,000	0.25	0.5	4	10
clover, subterranean (4)	80,000	0.25	1	10	20
clover, white (3, 4)	776,000	0.125	0.25	3	5
fava, small seed (4, 6)	1,000	0.75	3	80	200
flax	78,000	0.5	1.5	30	50
kale (1, 5)	124,800	0.25	0.5	3	8
mustards (1, 5)	150,000	0.25	0.5	2	10

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Figure 5. Example of the Cover Crop Selection Tool report showing seeding information for adapted species, including average seeds per pound, minimum/maximum seeding depth, and minimum/maximum recommended seeding rate for single species drilled planting.

Cover crop species included in this tool are generally adapted to environments in the western United States, but have not been evaluated in all possible situations. The performance of these cover crops can be highly variable, and is dependent on planting date, precipitation or irrigation, soil conditions, and other environmental factors. Cultivars or varieties may have different growth patterns or tolerances than the species in general. Consult with your local NRCS office, University Extension, and local farmers to find out what works best in your area and how to use the cover crops effectively. Also, experiment with cover crops on small areas of your farm before implementing the practice on a large scale.

It is the producers' responsibility to follow all state and federal laws.

If you find any information in this tool to be incomplete or inaccurate, please send edits to Annie Young-Mathews ([anna.young-mathews@or.usda.gov](mailto:anna.young-mathews@or.usda.gov)), Allen Casey ([allen.casey@wa.usda.gov](mailto:allen.casey@wa.usda.gov)), or Derek Tilley ([derek.tilley@id.usda.gov](mailto:derek.tilley@id.usda.gov)).