



Building a Common Garden Network for High Throughput Seed Transfer Development

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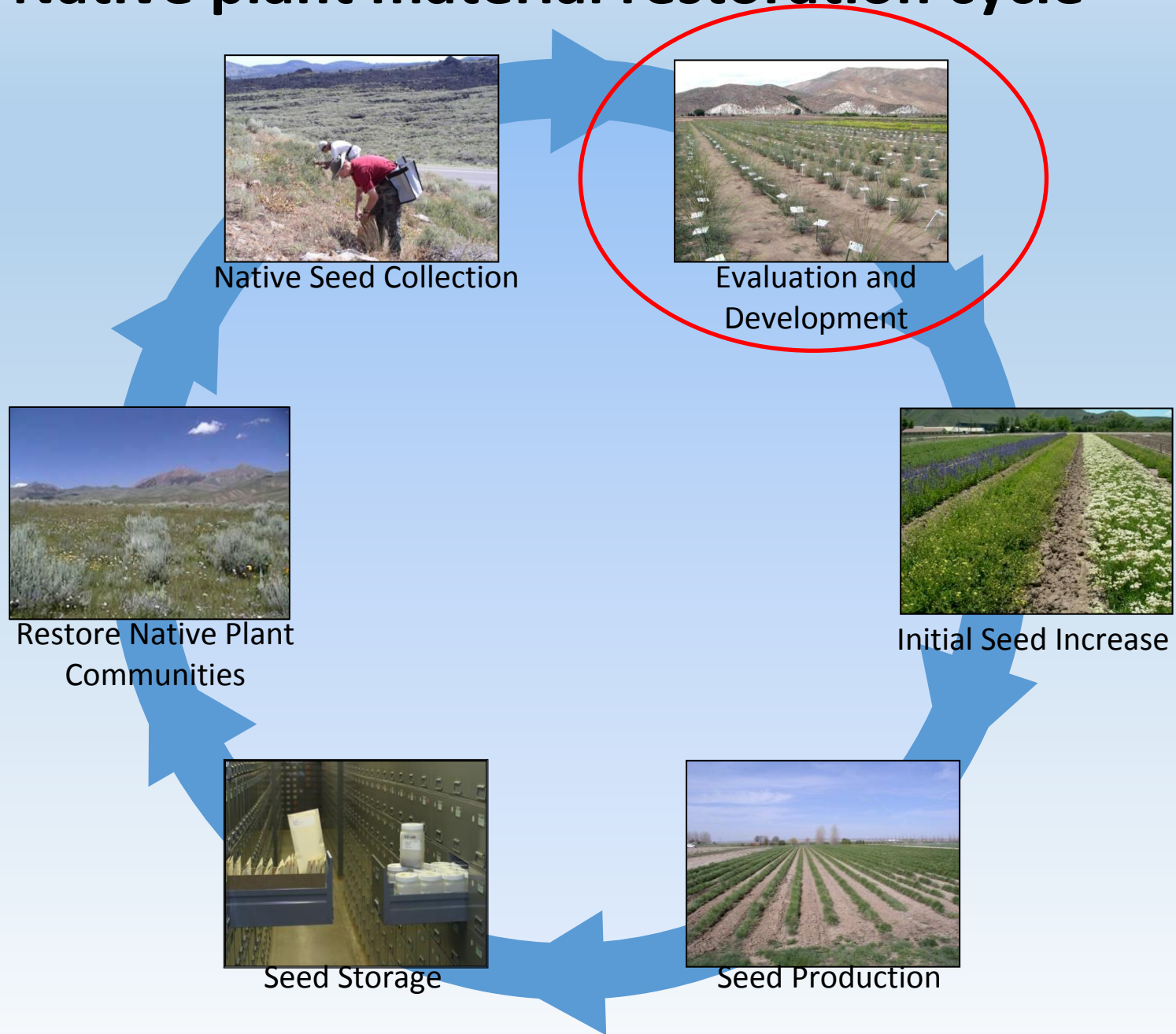
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Bureau of Land Management, Reno, NV

Native plant material restoration cycle



Native plant material restoration cycle



Trait Selection

Seed collection	1-3 yr
Evaluation and selection for desired traits	1-2 yr
Evaluation and selection for desired traits	1-2 yr
?	2-10 yr
Evaluation of selected lines in restoration conditions	5 yr
Available for production	10-22 yr



Trait Selection

Seed collection	1-3 yr
Evaluation and selection for desired traits	1-2 yr
Evaluation and selection for desired traits	1-2 yr
?	2-10 yr
Evaluation of selected lines in restoration conditions	5 yr
Available for production	10-22 yr

Source Selection

Seed collection	1-3 yr
Evaluation and selection for populations with desired traits	2-5 yr
?	0-5 yr
Evaluation of selected lines in restoration conditions	5 yr
Foundation seed increase for desired zones (additional seed collection?)	2-3 yr
Available for production	10-21 yr

Trait Selection

Seed collection

1-3 yr

Evaluation and selection for desired traits

1-2 yr

Evaluation and selection for desired traits

1-2 yr

?

2-10 yr

Evaluation of selected lines in restoration conditions

5 yr

Available for production

10-22 yr

Source Selection

Seed collection

1-3 yr

Evaluation and selection for populations with desired traits

2-5 yr

?

0-5 yr

Evaluation of selected lines in restoration conditions

5 yr

Foundation seed increase for desired zones (additional seed collection?)

2-3 yr

Available for production

10-21 yr

Seed Transfer

Seed collection

1-3 yr

Common garden study

2-3 yr

Seed transfer guidelines

1-2 yr

Evaluation of selected lines in restoration conditions

5 yr

Foundation seed increase for desired zones (additional seed collection?)

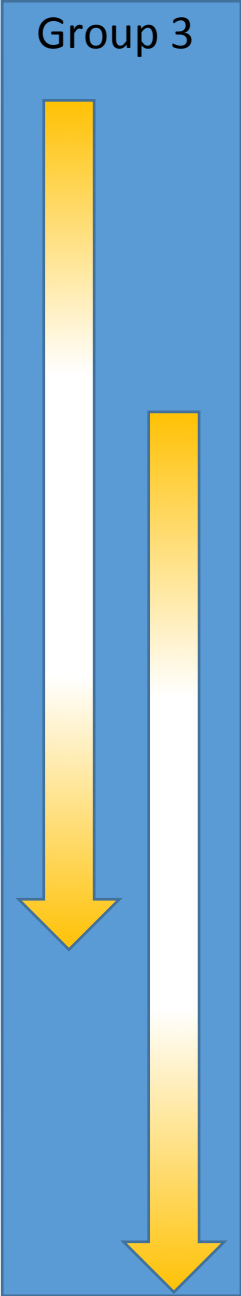
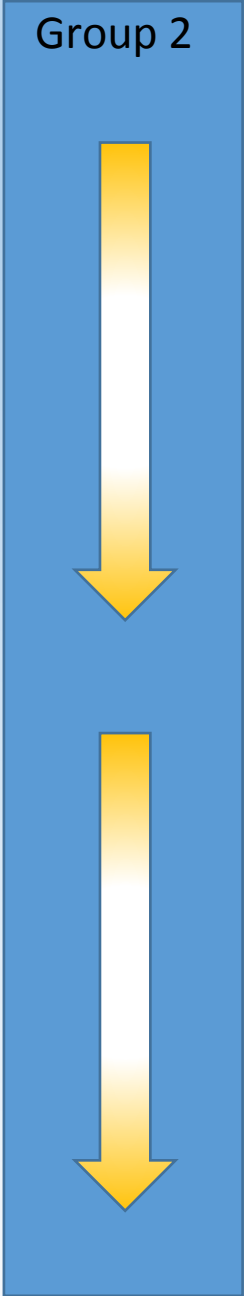
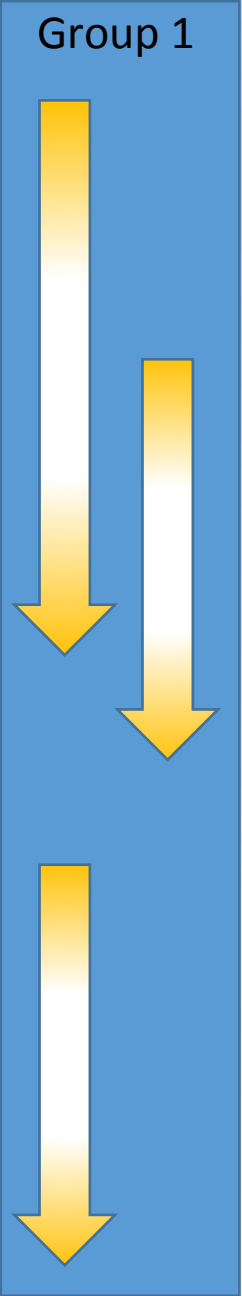
2-3 yr

Available for production

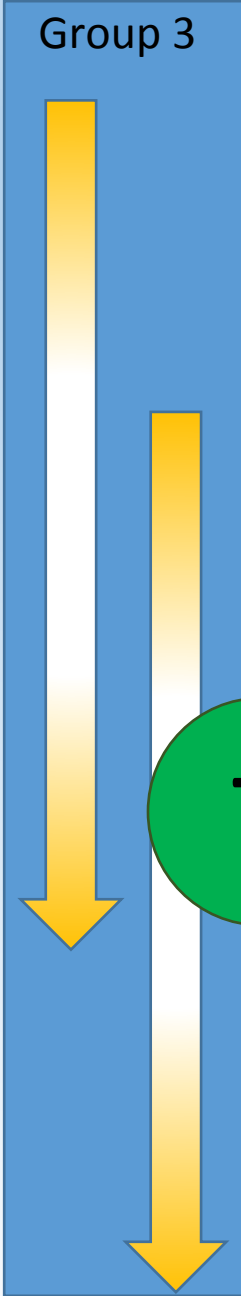
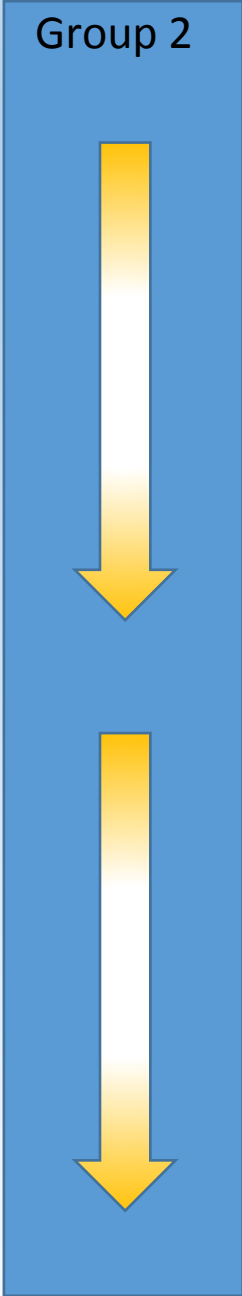
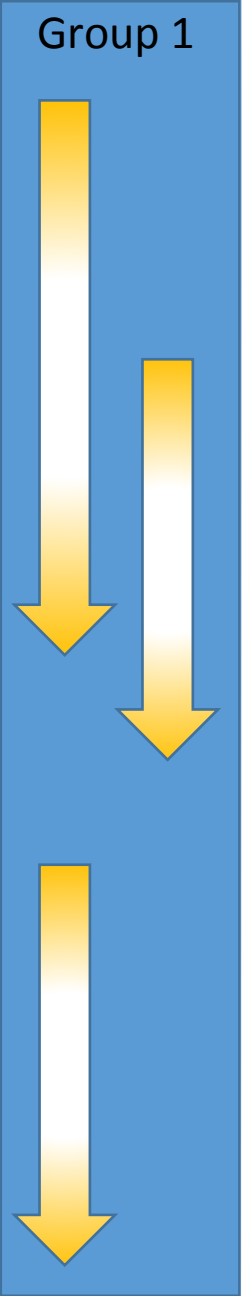
10-16 yr

**Building an efficiencies
into plant material
evaluation and
development**

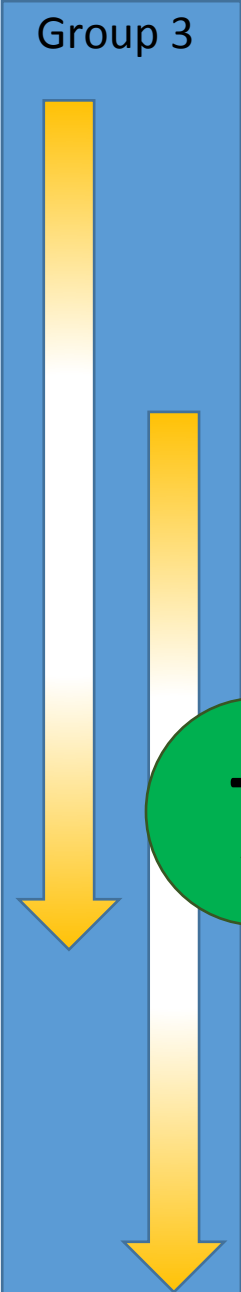
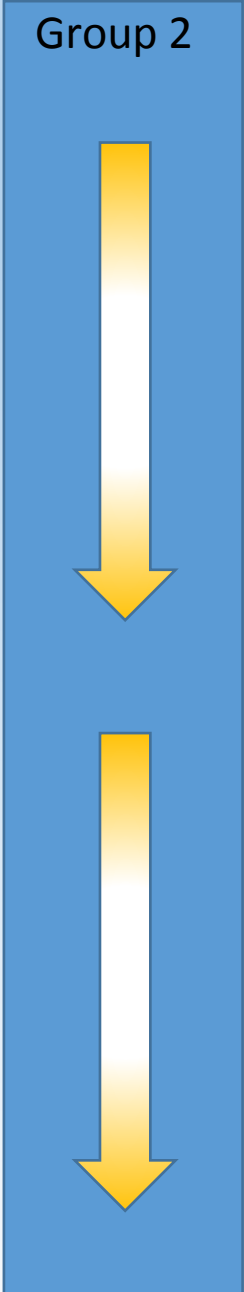
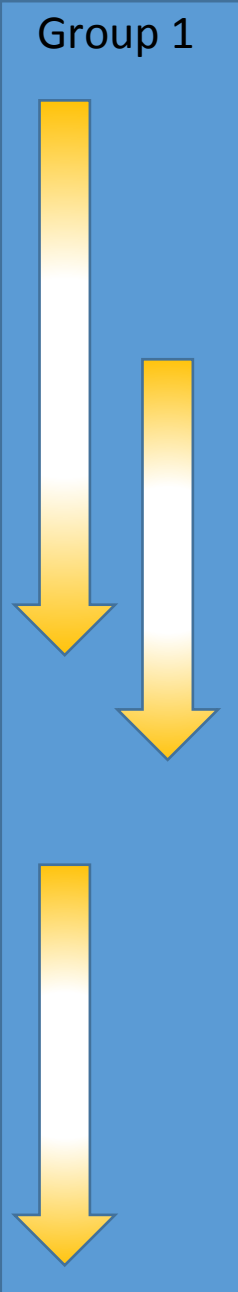
Coordination



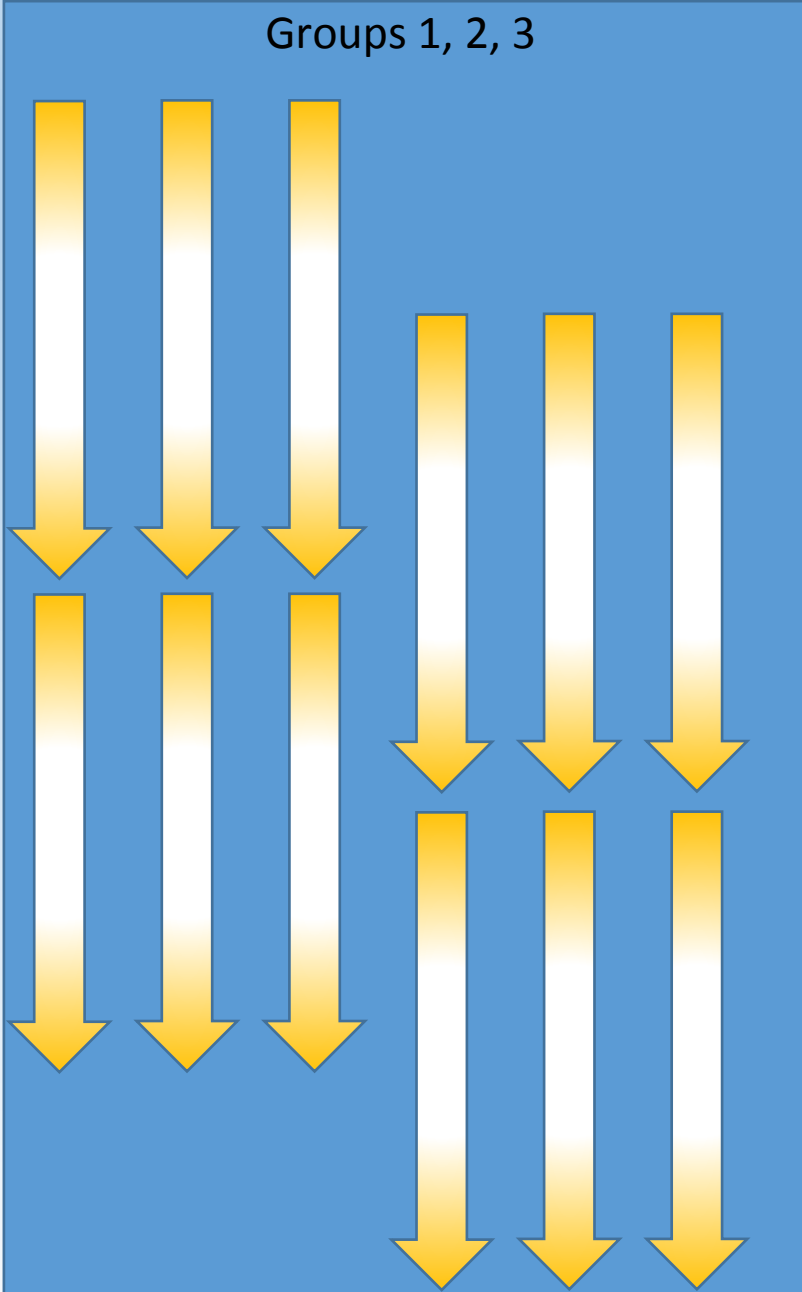
Coordination



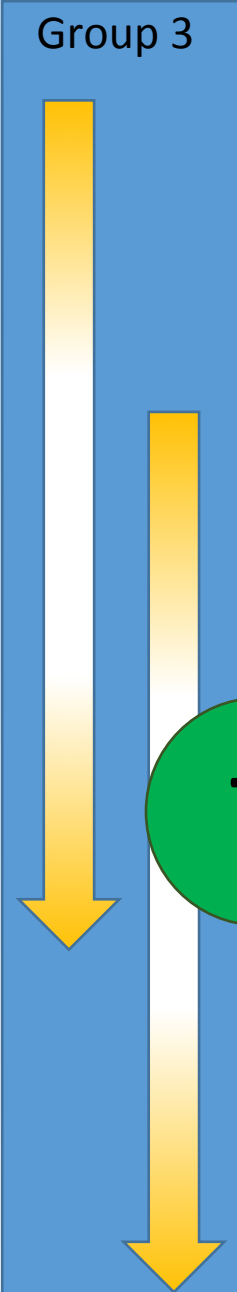
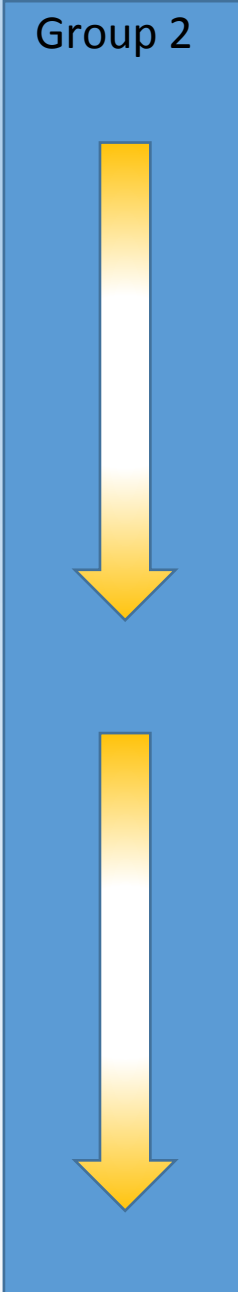
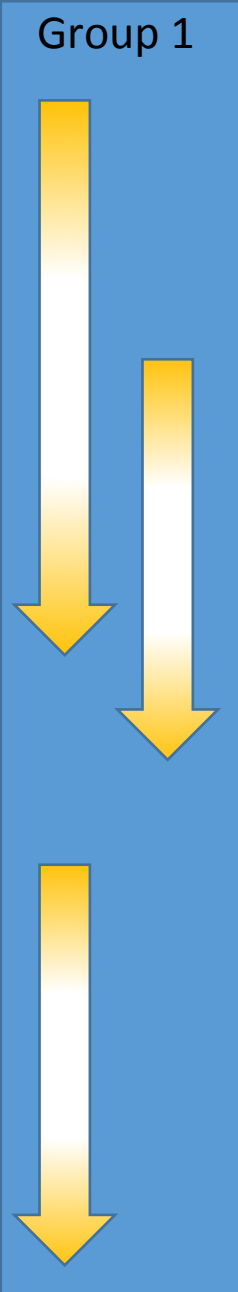
Coordination



7

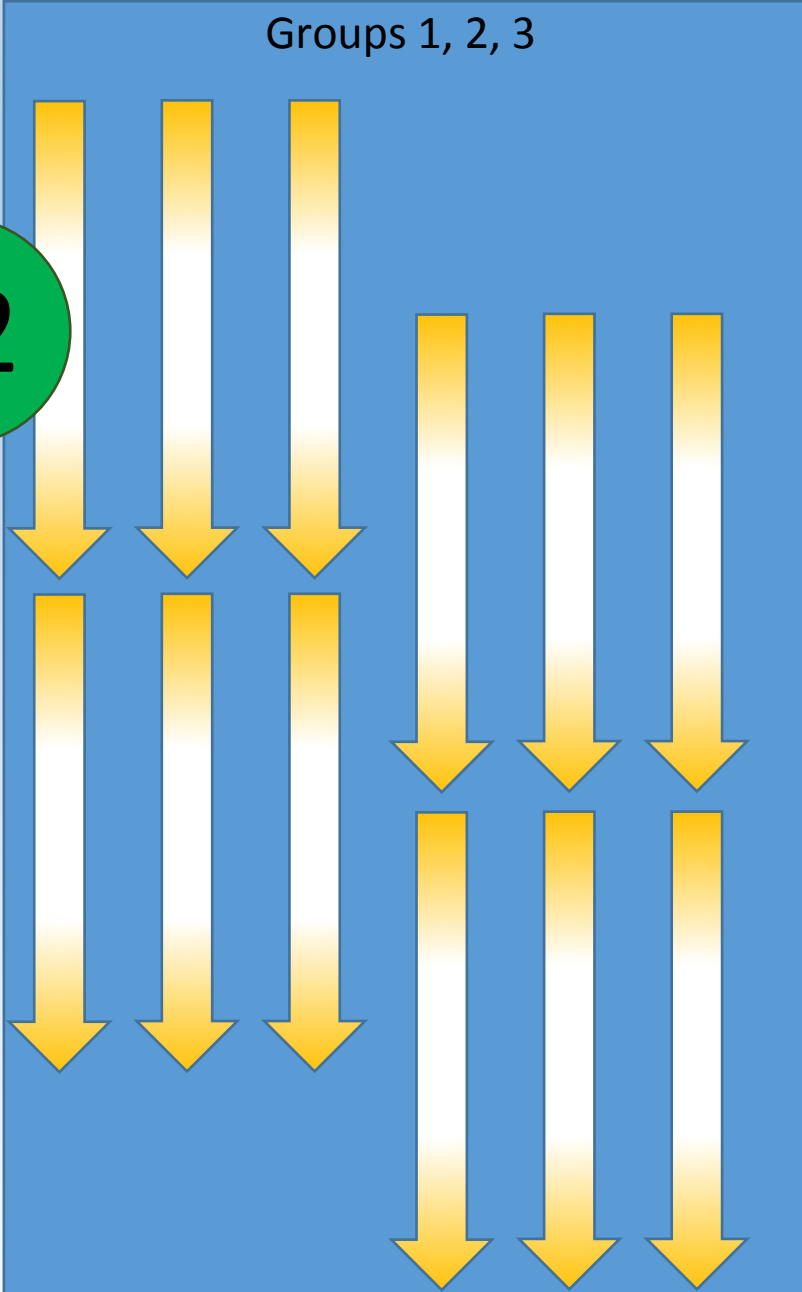


Coordination



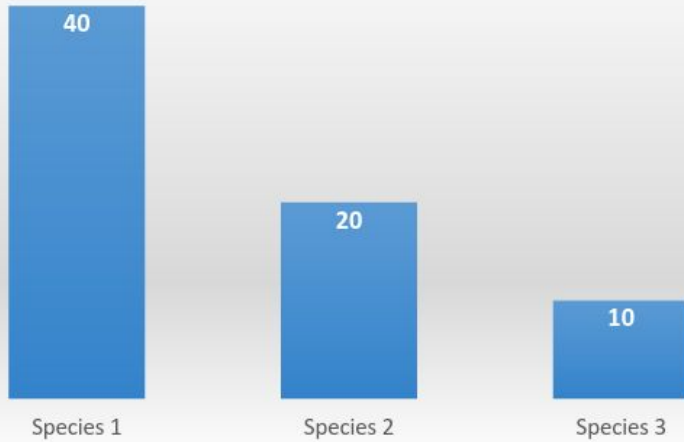
12

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Costs

Hypothetical Training Hours per Technician



Cumulative Field Season Cost

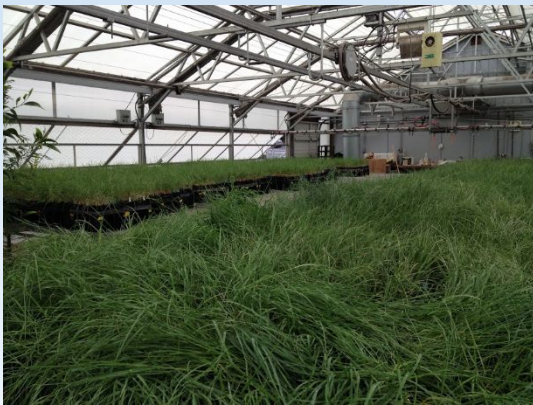


Additional efficiencies

Seed collection

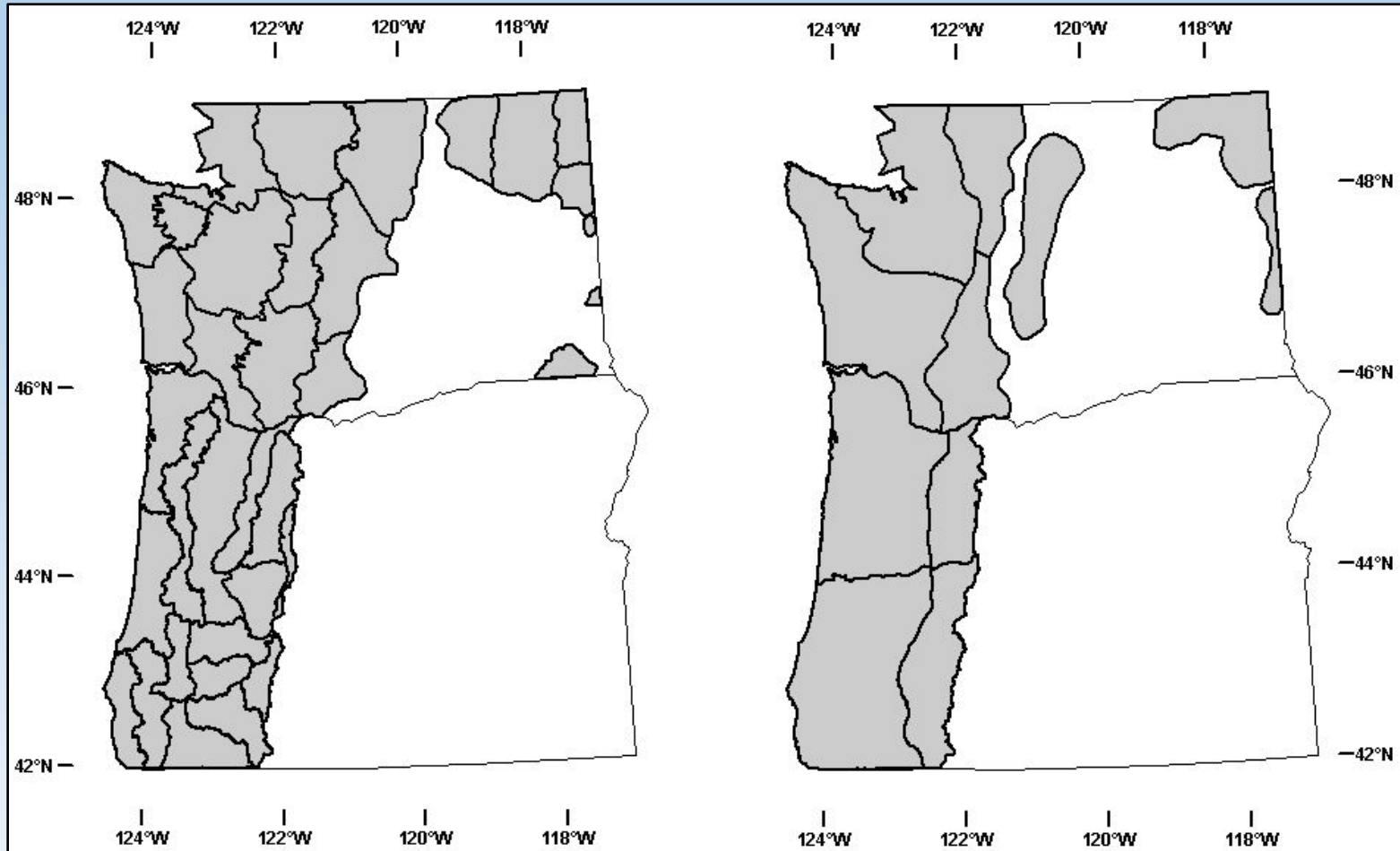
Developing cultivation
practices

Seed increase



Seed transfer guidelines (seed zones)

Seed zones originate in forestry

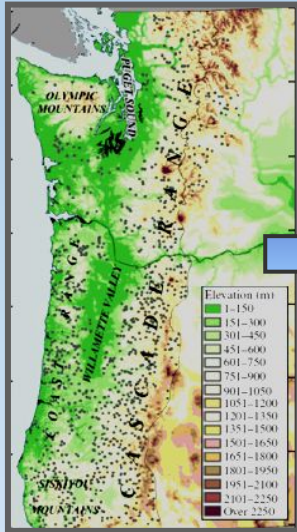


Douglas-fir; *Specialist*

Western redcedar; *Generalist*

Adaptive seed zones are constructed using data from common garden studies

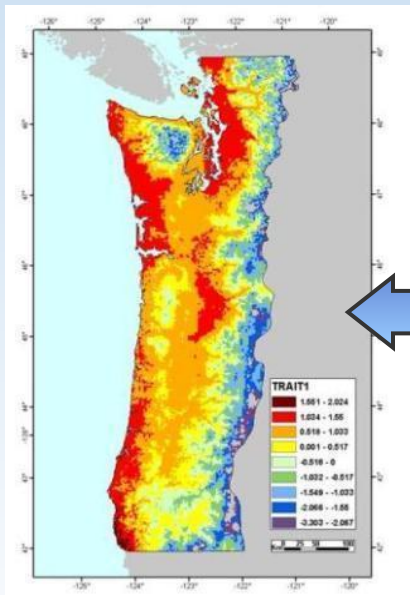
Collect seed from many sources



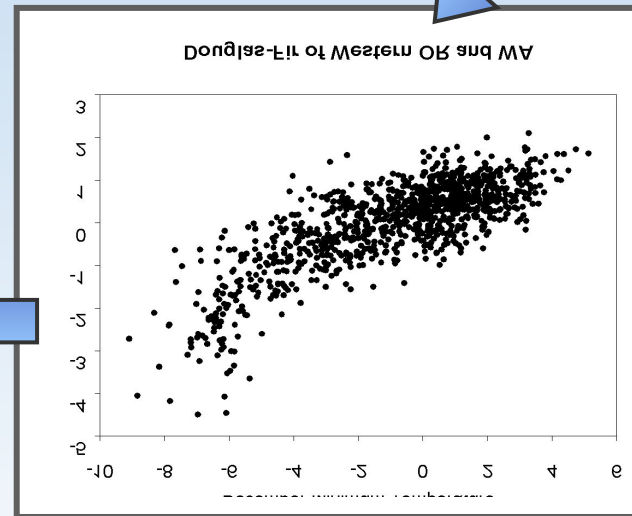
Grow families in a common environment



Measure many adaptive traits

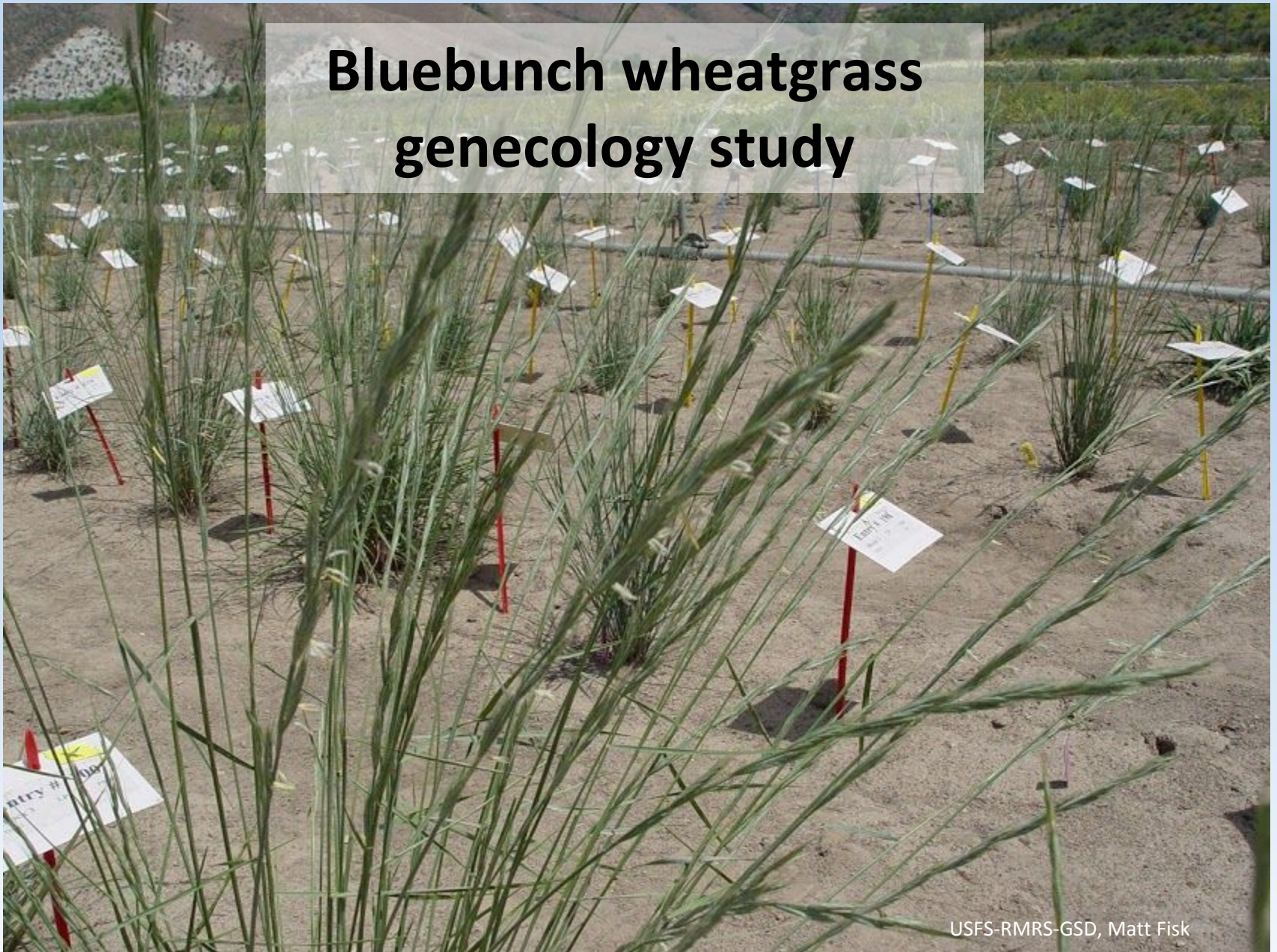


GIS

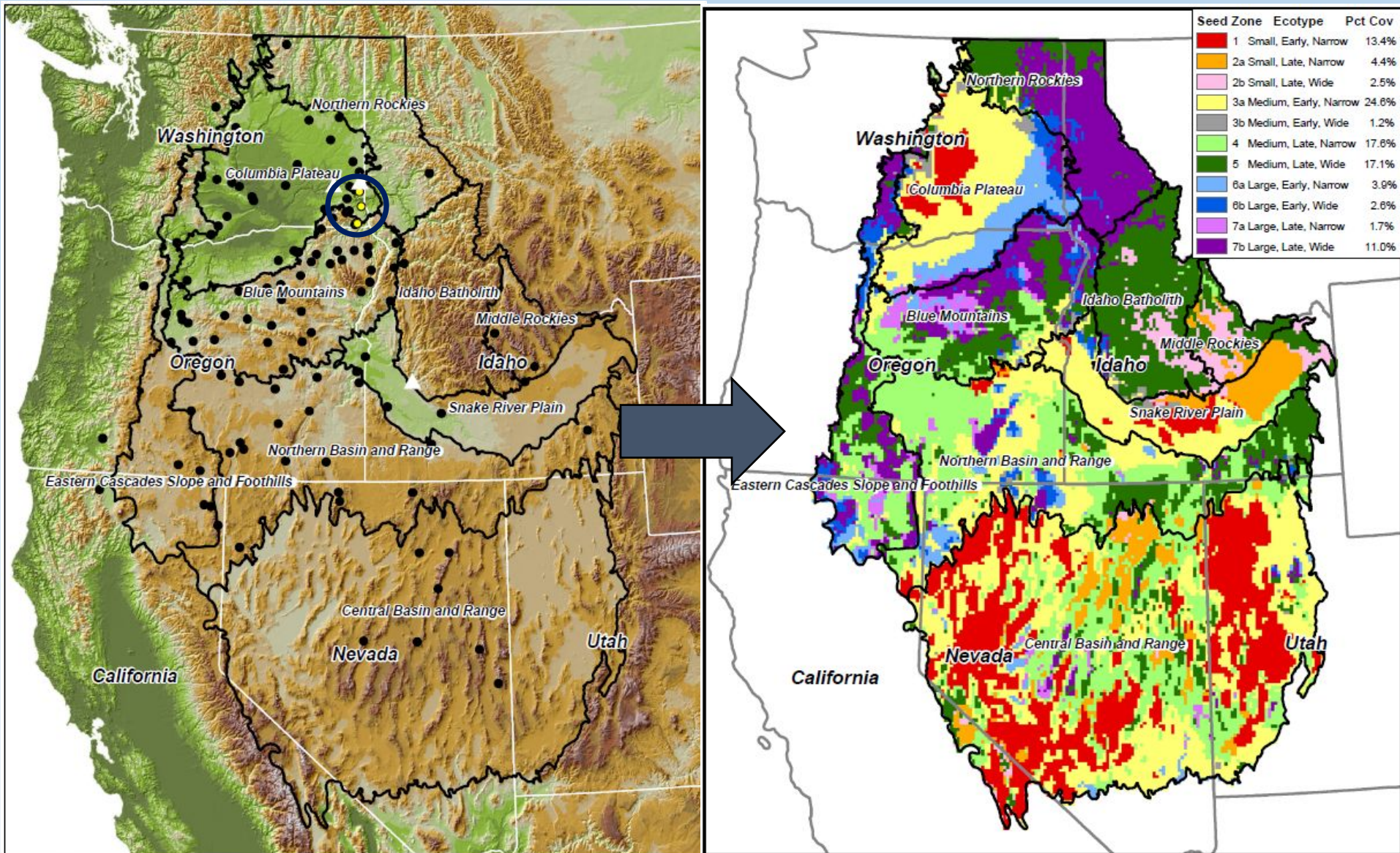


Traits vs source environment

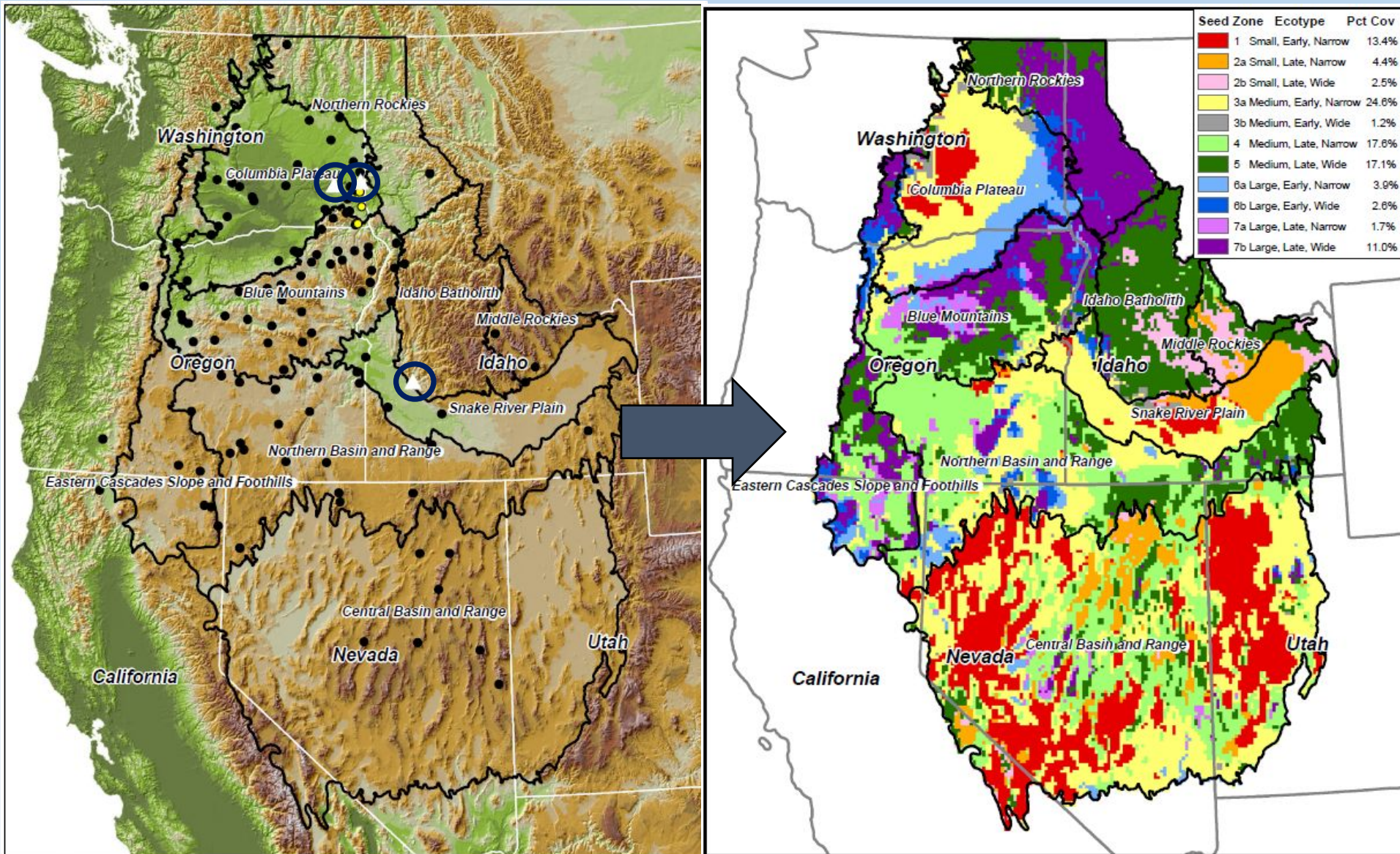
Bluebunch wheatgrass genecology study



Bluebunch wheatgrass genecology study



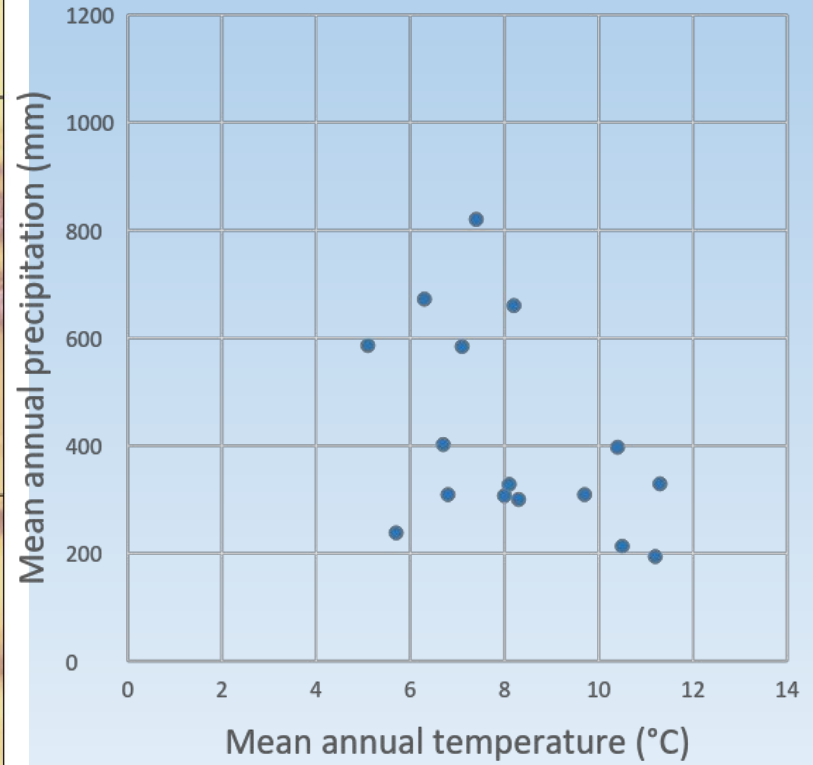
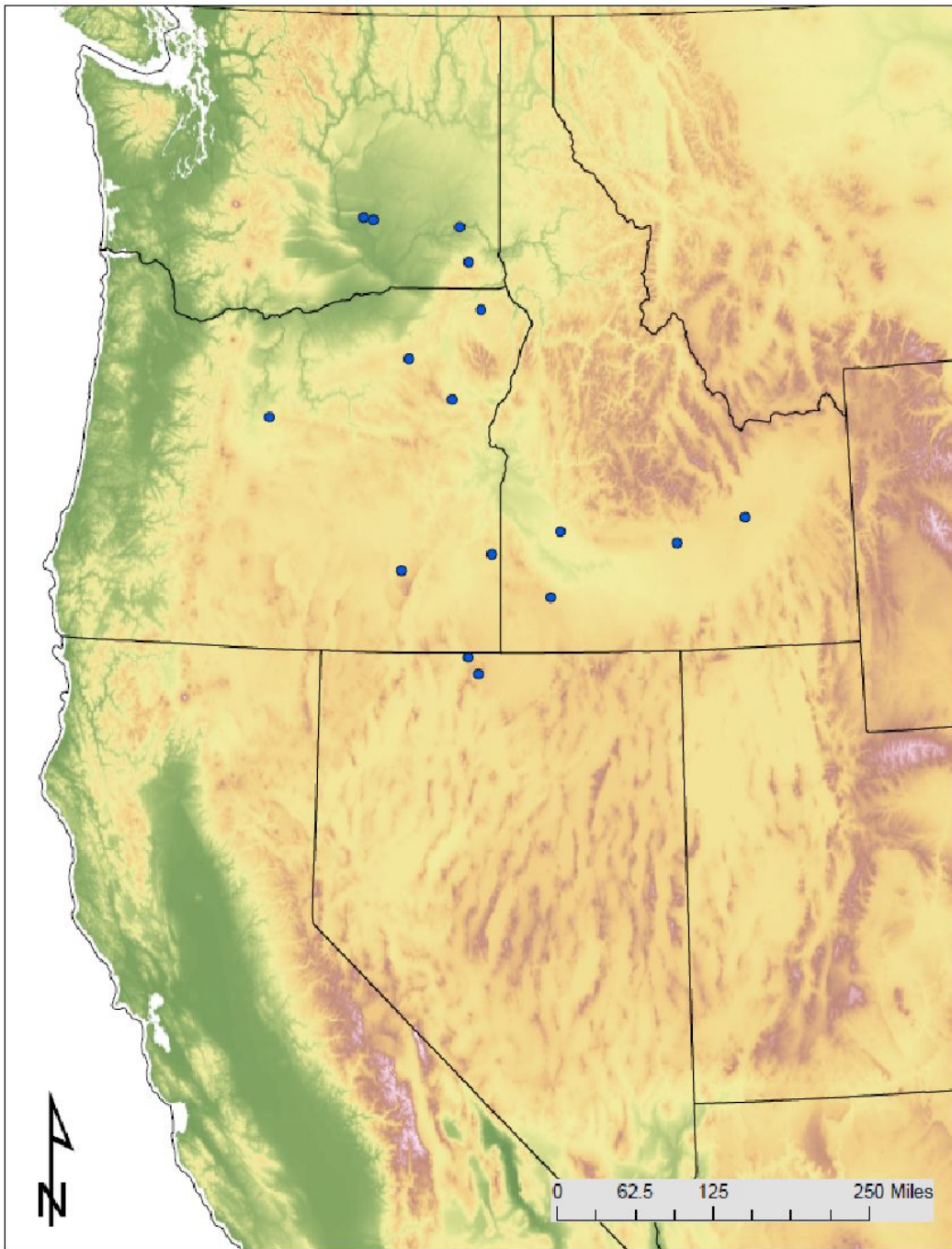
Bluebunch wheatgrass genecology study



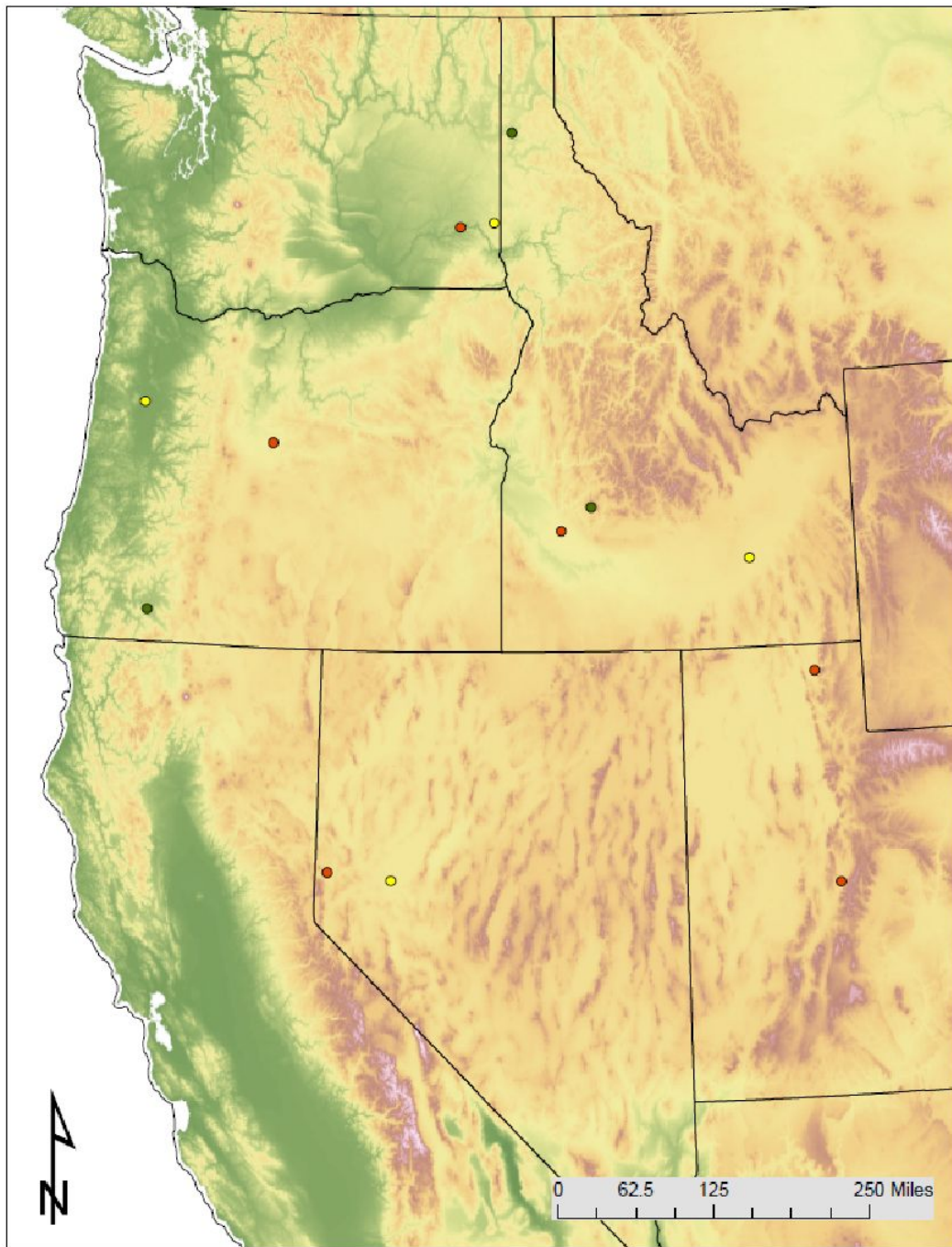
Bluebunch wheatgrass reciprocal transplant study



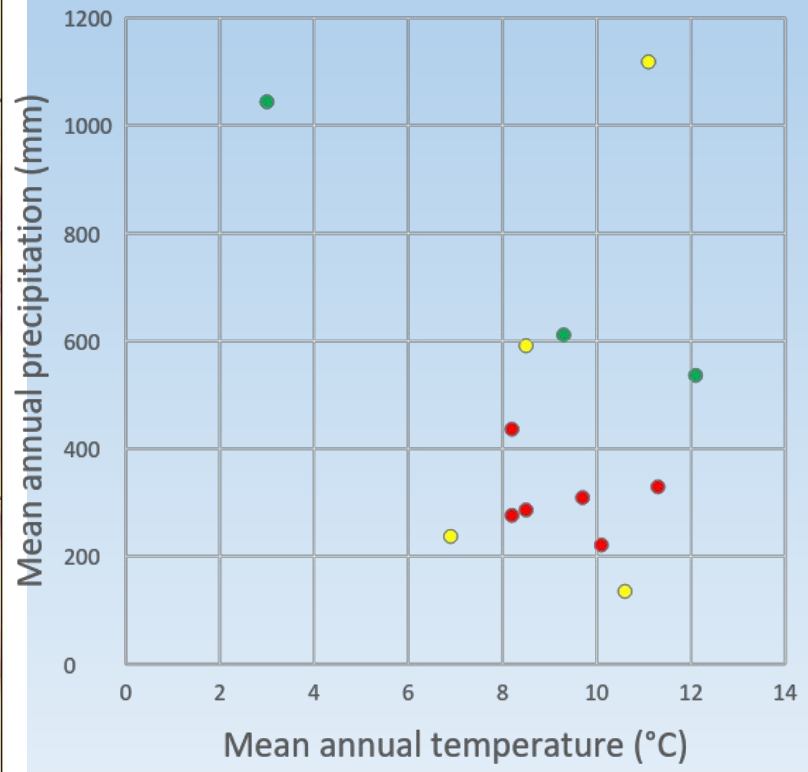
Bluebunch reciprocal transplant study sites



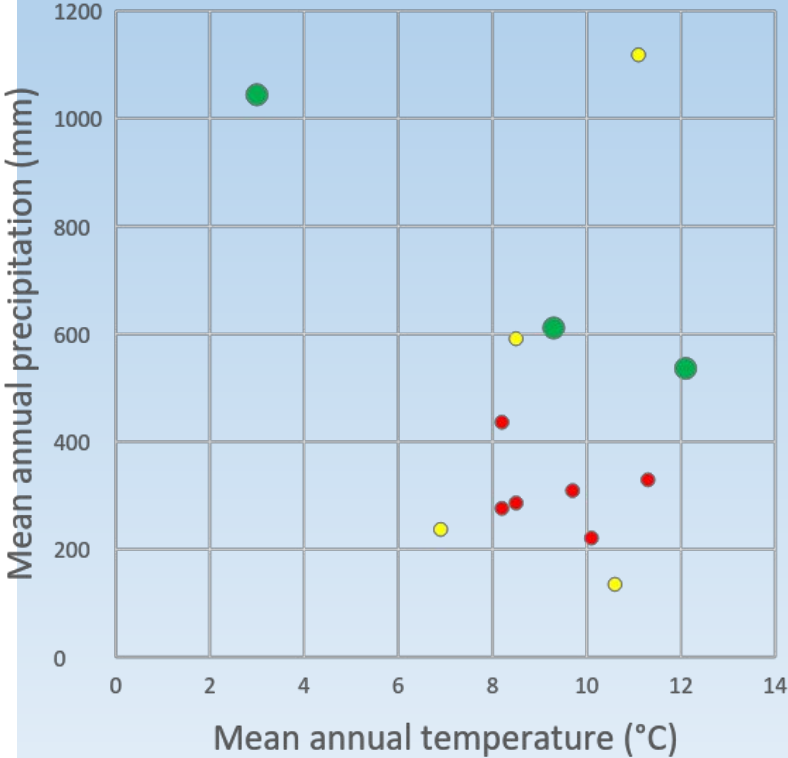
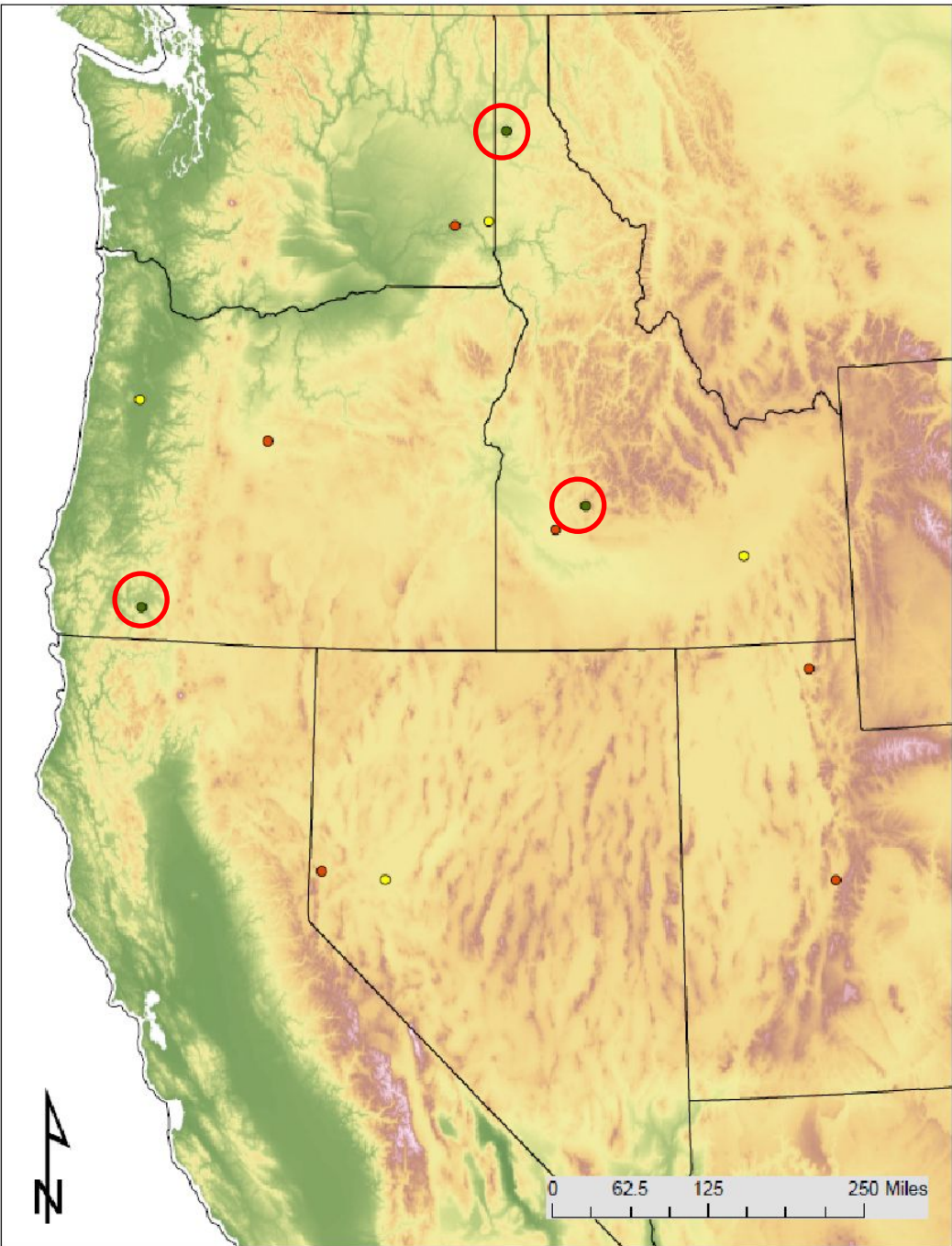
Intermountain common garden network (the beginnings)



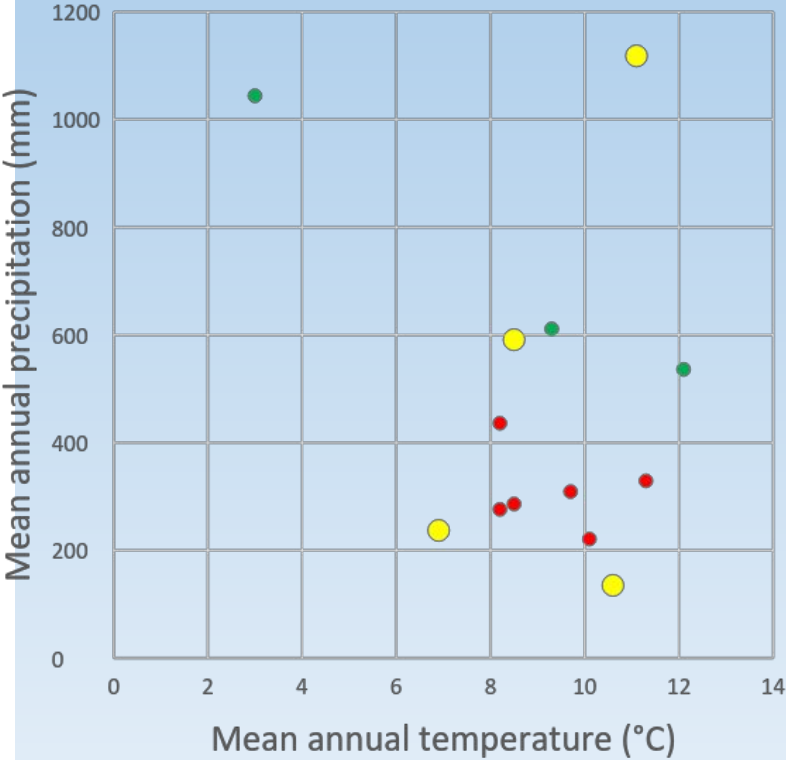
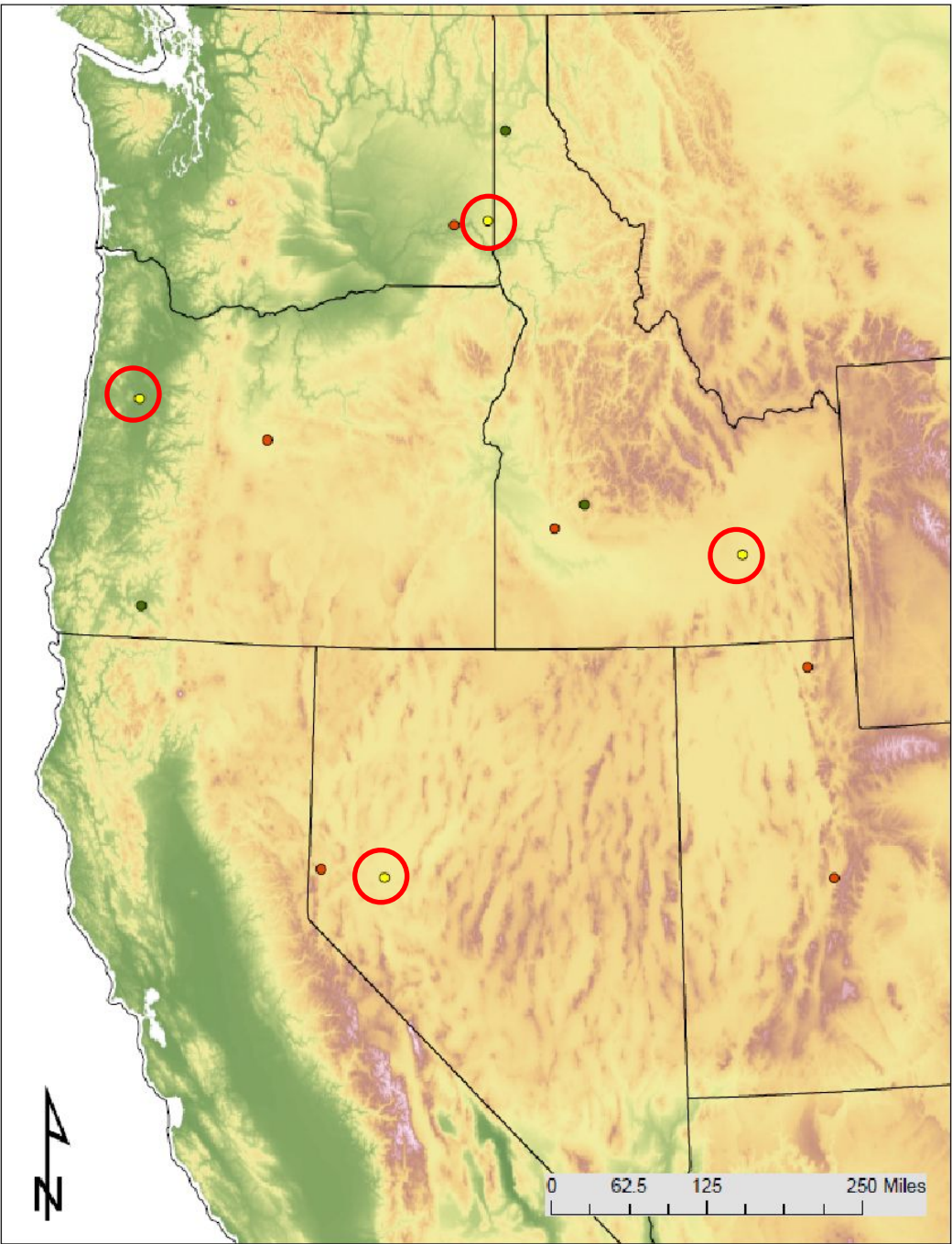
Sites with staff/personnel



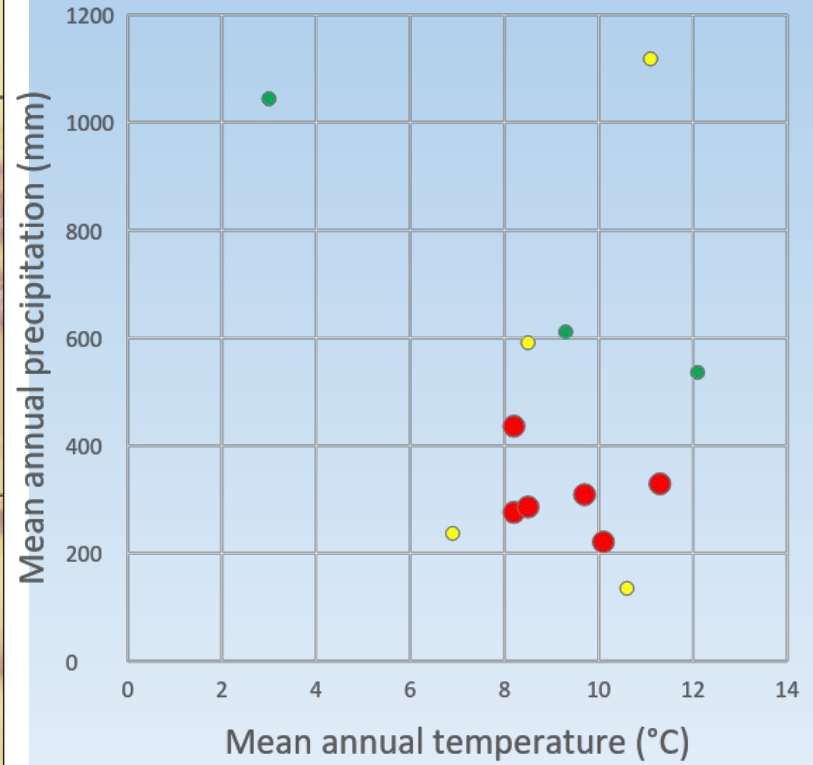
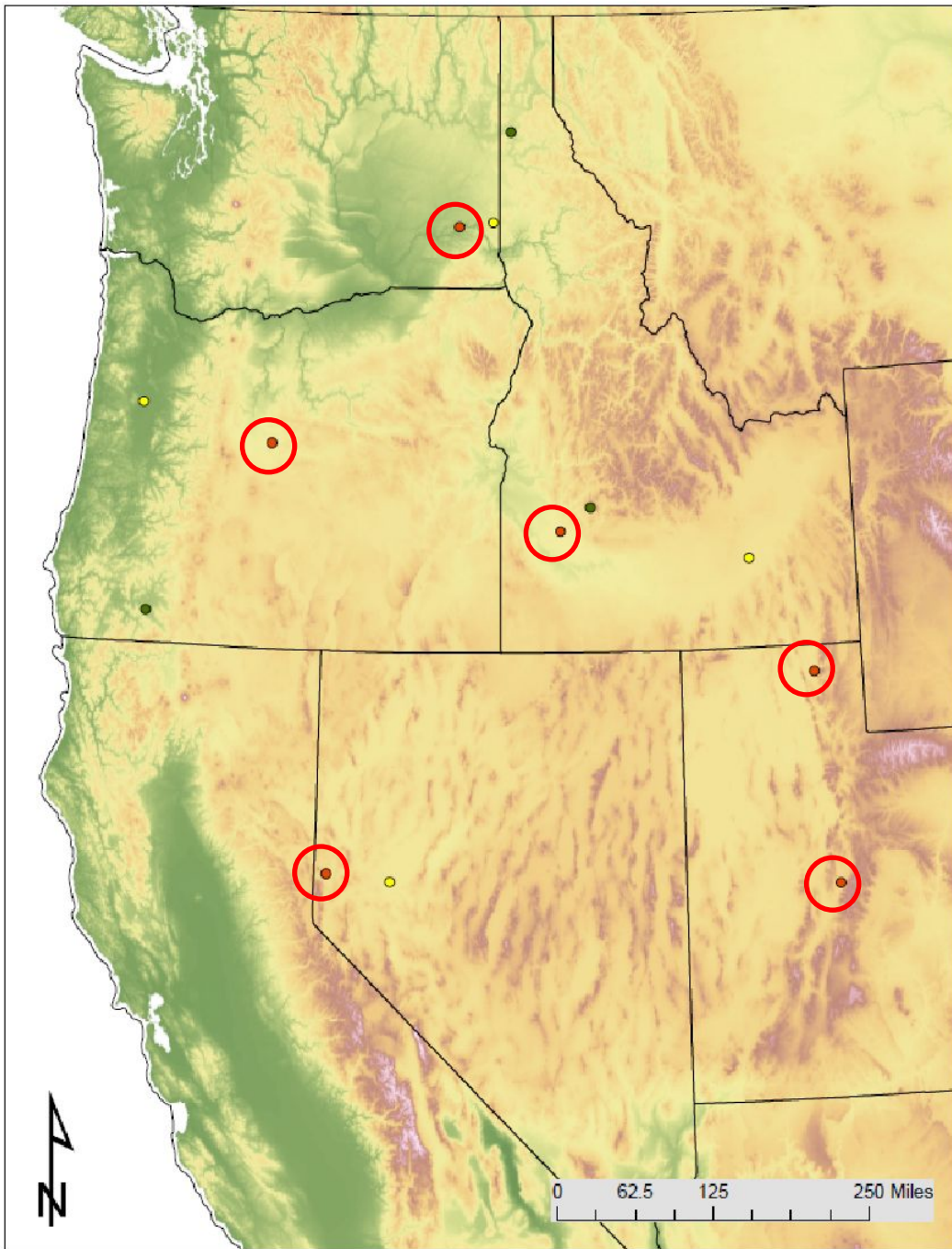
Forest Service nurseries

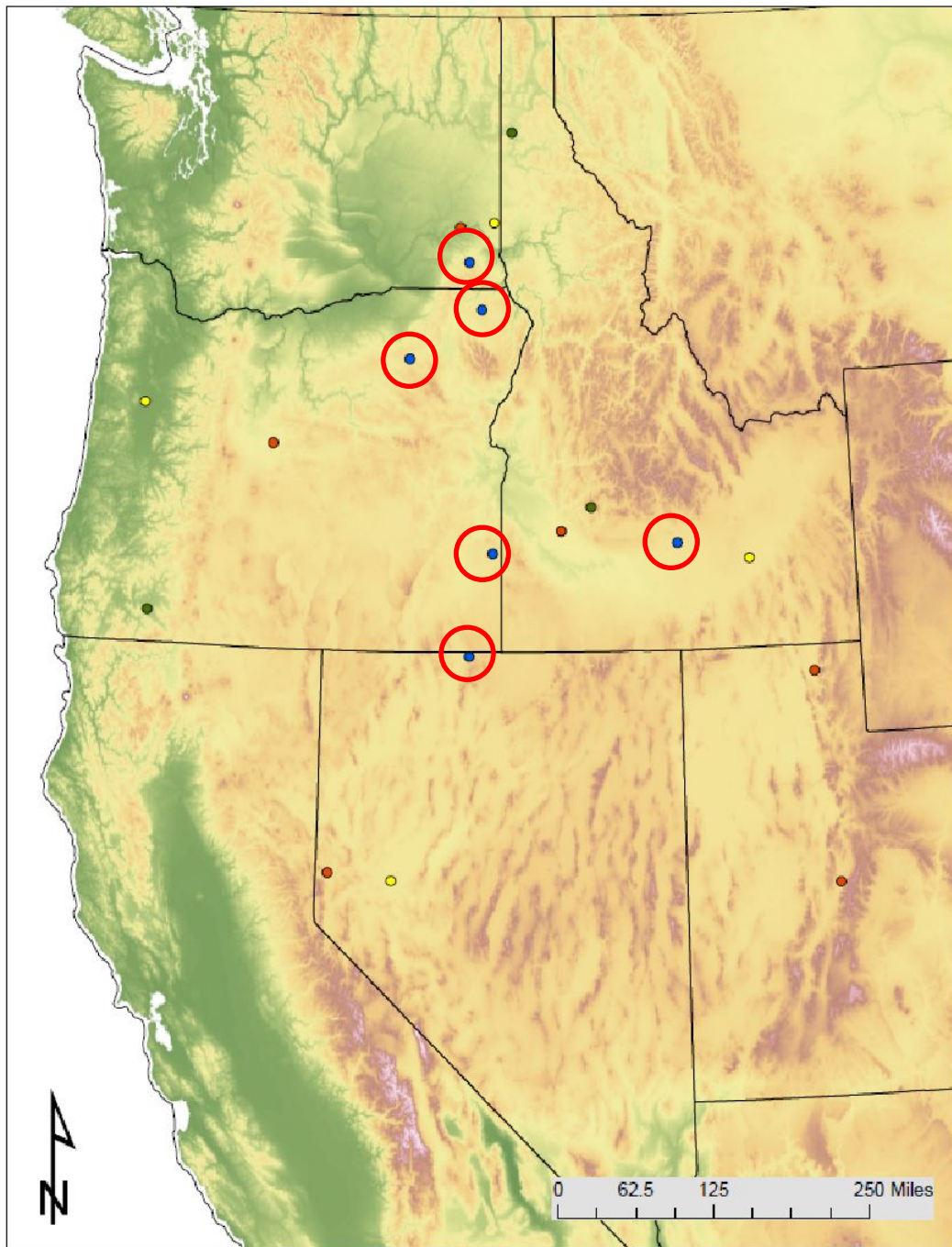


NRCS Plant Materials Centers

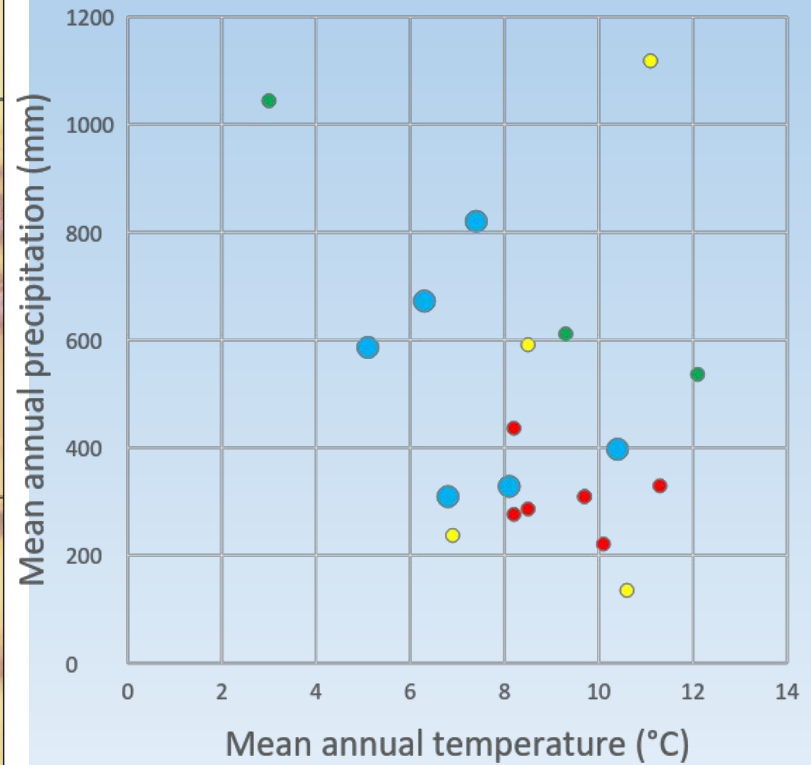


Various long-term research sites, universities and federal





Bluebunch reciprocal transplant sites with extra infrastructure (fences)





Showy goldeneye
(*Heliomeris multiflora*)



Thickleaf penstemon
(*Penstemon pachyphyllus*)



Douglas' dustymaiden
(*Chaenactis douglasii*)



Hoary tansyaster
(*M. canescens*)



Nettleleaf horsemint (*A. urticifolia*)



Yellow beeplant
(*Cleome lutea*)



Globemallow
(*S. grossulariifolia*)

THANK YOU!

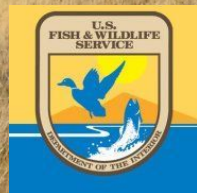
Sarah Kulpa

Dirk Netz

Holly Prendeville

John Proctor

Brad St. Clair





The preceding presentation was delivered at the

2017 National Native Seed Conference

Washington, D.C. February 13-16, 2017

This and additional presentations available at <http://nativeseed.info>

