

**Project Title:**

- Establishment and Maintenance of Certified Generation 1 (G1) Seed
- Propagation of Native Forbs
- Plant Display Nursery Evaluation
- Develop Technology to Improve the Diversity of Introduced Grass Stands

**Location:** NRCS Aberdeen, ID Plant Materials Center

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**Project Description:** Production of Certified Generation 1 (G1) seed of Anatone Germplasm bluebunch wheatgrass, Maple Grove Germplasm Lewis flax, Snake River Plains Germplasm fourwing saltbush and Northern Cold Desert Germplasm winterfat to facilitate commercial seed production. Propagation of native forbs for evaluation and seed increase. Evaluation of display nursery near Boise, ID. Assist in development of technology to improve the diversity of introduced grass stands by evaluating methods to introduce native species into established plant communities. Equipment and Strategies to enhance the post-wildfire establishment and persistence of Great Basin native plants.

**Seed Production**

**Anatone Germplasm bluebunch wheatgrass** – Currently 5.2 acres are in production. Estimated seed yield from 2007 seed crop is 1,384 pounds. Shipped 400 pounds of Certified seed to commercial growers in 2007.

**Maple Grove Germplasm Lewis Flax** – Seed fields established in 2005 (3.2 acres) and 2006 (3.2 acres) were contaminated with ‘Appar’ blue flax so harvested seed could not be certified. Attempts to rouge out Appar were unsuccessful. The field established in 2006 was used to conduct a herbicide tolerance trial in cooperation with the University of Idaho. No seed was shipped to commercial growers in 2006. The PMC will establish a new field in 2008 with stock seed to be provided by the FS Rocky Mountain Research Station.

**Snake River Plains Germplasm fourwing saltbush** – Estimated seed yield from 2007 crop is 24 pounds. No seed was requested by commercial growers in 2007.

**Northern Cold Desert Germplasm winterfat** – Estimated seed yield from 2007 crop is 8 pounds. Shipped 4 pounds of Certified seed to commercial growers in 2007.

### **Propagation of Native Forbs**

The original project plan in 2005 was to propagate 8,000 plants total of *Lomatium dissectum* (LODI) fernleaf biscuitroot, *Lomatium grayii* (LOGR) Grays biscuitroot, *Lomatium triternatum* (LOTR) nineleaf biscuitroot, *Eriogonum umbellatum* (ERUM) sulphurflower buckwheat, *Penstemon deustus* (PEDE) hotrock penstemon, *Penstemon acuminatus* (PEAC) sharpleaf penstemon, and *Penstemon speciosus* (PESP) sagebrush penstemon in the greenhouse. Approximately 1000 plants each of ERUM and LOTR were to be transplanted at the PMC and remaining plants were to be made available to cooperators for transplanting at field sites. Due to no plant establishment of *Lomatium* species and minimal success with greenhouse propagation of *Penstemon* species, no plants were made available to cooperators. All plants that were successfully propagated in the PMC greenhouse were transplanted at the PMC during the 2005 growing season and direct dormant seeding of *Eriogonum*, *Lomatium* and *Penstemon* accessions were completed at the PMC in November 2005. Weed barrier fabric was installed to control weeds.

On May 8, 2007 the biscuitroot and sulphurflower buckwheat plots were treated with a wick application of 100 percent Roundup to control weeds and on June 18 they were also hand weeded. On June 20, 2007 survival counts were made and seed was harvested at seed ripeness and the results are shown in the following table:

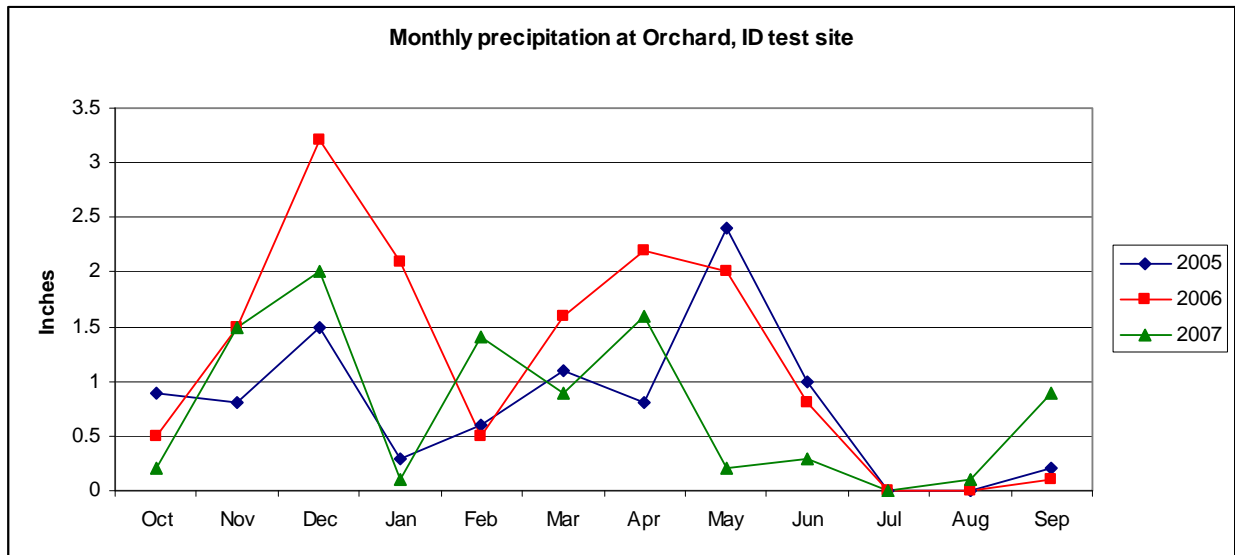
<u>Species</u>	<u>Survival (percent)</u>	<u>Clean seed (pounds)</u>
ERUM	40	4.0
LODI	25	NA
LOGR	70	NA
LOTR	71	NA
PEAC	68	8.0 (estimated)
PEDE	58	19.0 (estimated)
PESP	60	0.7

By early July, the *Lomatium* species had gone completely dormant. None of the *Lomatium* plants have yet to develop flowers. It is thought that most of their energy is still going to development of the tap root. In early November 2007 the dormant *Lomatium* plots were treated with a spray application of Roundup to control weeds that were still green. PEAC (a short-lived species) is beginning to die out.

## Orchard Display Nursery Evaluation Summary

### Introduction

The Orchard Display Nursery was planted on November 16, 2004 in cooperation with the Great Basin Native Plant Selection and Increase Project. The nursery includes 82 accessions of 27 native and introduced grass, forb and shrub species. Each accession was planted in 7 X 60 foot plots. See Tilley et al (2005) for descriptions of the species and accessions planted. The remaining area was planted to a cover crop mix of 50% Anatone bluebunch wheatgrass, 20% Bannock thickspike wheatgrass, 20% Magnar basin wildrye and 10% Snake River Plains fourwing saltbush. The test site is located on a loamy 10-12 inch precipitation ecological site that historically supported a Wyoming big sagebrush - bluebunch wheatgrass – Thurber’s needlegrass plant community. Total precipitation at the Orchard Test Site for water year 2005 was 9.6 inches, 2006 was 14.4 inches and total accumulated precipitation for 2007 was 8.5 inches (USDA 2007).



### Materials and Methods

The Bureau of Land Management (BLM) burned the site in the fall of 2002. The site was later sprayed by PMC staff in May 2003 and May 2004 with a Roundup/2, 4-D herbicide mix to create a weed free seedbed. Due to limited breakdown of dead grass clumps that would inhibit proper seed placement with a drill and to ensure a clean seedbed, the decision was made to cultivate the site with a culti-packer just prior to seeding. During the first evaluation most plots contained high numbers of Russian thistle (*Salsola* sp.) and moderate amounts of bur buttercup (*Ranunculus testiculatus* Crantz) plants. Russian thistle plants were approximately two to three inches tall and the buttercup plants had already flowered. At the time of the second evaluation, there was a heavy infestation of tumble mustard (*Sisymbrium altissimum* L.). Plots were consequently sprayed again on June 9, 2005 with 16 oz. 2, 4-D and 8 oz. Clarity per acre to control the mustard.

The first evaluation of the plots for initial establishment was conducted on April 27, 2005 using a frequency grid based on that described by Vogel and Masters (2001). The grid measured approximately 40 x 41 inches, having four ten inch columns (to incorporate 1 drill row per column) and five rows, totaling 20 cells. The first grid was laid on the rows approximately two grid lengths (80 inches) into the plot. Counts were made of the cells that contained at least one plant. Grids were subsequently flipped and evaluated three more times giving a total of 80 evaluated cells. Total area for one grid is approximately 1m<sup>2</sup>. Total area evaluated is therefore approximately 4m<sup>2</sup>. A conservative estimate of plant density (plants/m<sup>2</sup>) is the total number of cells containing at least one plant divided by four. The second evaluation occurred on May 25, 2005. The 2006 evaluation was conducted on May 31, and the 2007 evaluation took place on May 16. The methods followed in 2006 and 2007 were the same as described above; however, the frame was evaluated five times for a total of 100 cells or 5m<sup>2</sup>. Total counts were then divided by five for approximate plants/m<sup>2</sup>. Numbers for approximate plants/m<sup>2</sup> were then divided by 10.8 to calculate approximate plants/ft<sup>2</sup>. It is important to note that because cells with plants were counted and not number of plants per cell, the best possible score is 100 hits per five frames which converts to 20 plants/m<sup>2</sup> or 1.85 plants/ft<sup>2</sup>. Actual plant density may be higher than the numbers indicated below. All tables have been arranged with accessions ranked from highest plant density to the lowest at the time of the second evaluation in 2005. Data were not analyzed for significance.

### **Native Grasses**

There were forty-seven accessions of native grasses planted. Overall the native grasses established well considering the limited amount of precipitation received over the winter and early spring of 2005. Especially good stands were seen in the bluebunch wheatgrass and Snake River wheatgrass plots during 2005. There was a marked decrease in plant density between the first and second evaluations with some notable exceptions. Seven of nine bluebunch wheatgrass accessions and three of four Snake River wheatgrass accessions increased in density from the first evaluation to the second. This is possibly due to receiving 2.5 inches of precipitation during that period and/or from a lack of pressure by black grass bugs (*Labops* sp.). Most of the native grasses decreased steadily in density from 2005 to 2007.

In 2005 the best performing Indian ricegrass accession was White River, having a plant density of 0.56 plants/ft<sup>2</sup> during the first evaluation and 0.17 plants/ft<sup>2</sup> during the second evaluation. In 2006 and continuing to 2007 there were no plants of any Indian ricegrass accessions observed in the evaluation grids and very few seen within their respective plots.

In 2005 the squirreltail plots had as high as 0.54 plants/ft<sup>2</sup> with Fish Creek. In 2006 all squirreltail accessions had decreased. Fish Creek maintained the best plant density with 0.26 plants/ft<sup>2</sup>. Densities remained essentially the same in 2007.

Bannock thickspike wheatgrass had a density of 1.04 plants/ft<sup>2</sup> and stayed essentially the same at the second evaluation of 2005. In 2006 Bannock had dropped to nearly half of

the original density to 0.58 plants/ft<sup>2</sup>. The 2007 evaluations showed small declines from established plots.

Revenue and San Luis slender wheatgrass both showed zero plants/ft<sup>2</sup> in 2006. Pryor slender wheatgrass similarly dropped in density but had 0.02 plants/ft<sup>2</sup>. In 2007 no slender wheatgrass plants could be found in any of the evaluated grids.

The western wheatgrass accessions had less dramatic declines in density from 2005 to 2006, but still showed poor stands with Rodan having the highest density of 0.13 plants/ft<sup>2</sup>. In 2007 all accessions had zero plants surviving.

The bluebunch wheatgrass accessions had the highest average densities of all the native grasses. All decreased slightly in density from 2005 to 2006, but still maintained good stands. P-12, Wahluke and Jim Creek all had densities over 1.00 plants/ft<sup>2</sup>. Columbia, Anatone, P-7 and P-15 had densities between 0.50 and 1.00 plants/ft<sup>2</sup> while P-5 and Goldar both shared low densities. In 2007 densities were generally slightly lower, but still higher than all other species as a whole. The highest density recorded in 2007 was Jim Creek at 1.07 plants/ft<sup>2</sup>.

Snake River wheatgrass accessions had good densities the establishment year with three accessions having densities greater than 1.00 plants/ft<sup>2</sup>. Numbers declined slightly yet steadily over the next two years. In 2007 the best density was from SERDP with 0.70 plants/ft<sup>2</sup>.

The plant densities of the basin wildrye accessions also decreased from 2005 to 2006; U108-02 and Trailhead retained the highest densities at 0.24 and 0.26 plants/ft<sup>2</sup> respectively. By 2007 the best density was achieved by Trailhead with 0.17 plants/ft<sup>2</sup>. U108-02 and U100-01 had similar densities with 0.11 and 0.13 plants/ft<sup>2</sup> respectively.

Sheep fescue stands remained poor from 2005 to 2006 with Covar slightly increasing from 0.00 to 0.07 plants/ft<sup>2</sup>. In 2007 Covar still had 0.07 plants/ft<sup>2</sup>, and Initial Point sheep fescue had decreased to 0.00 plants/ft<sup>2</sup>.

Thurber's needlegrass had no plants in the evaluated grids for any year.

All five of the Sandberg bluegrass accessions increased in density from 2005 to 2006. The best stands were observed in the High Plains and Mountain Home plots with respective stands of 0.54 and 0.35 plants/ft<sup>2</sup>. In 2007 all stands had been reduced to 0.0 plants/ft<sup>2</sup>.

Species	Name or accession	4/27/05	5/25/05	5/30/06	5/16/07
		-----Plants/ft <sup>2</sup> -----			
Indian ricegrass	Rimrock	0.37	0.20	0.00	0.00
	White River	0.56	0.17	0.00	0.00
	Nezpar	0.42	0.17	0.00	0.00
	Ribstone	0.14	0.09	0.00	0.00
	Paloma	0.05	0.00	0.00	0.00

<b>Squirreltail</b>	Fish Creek	0.97	0.54	0.26	0.22
	Sand Hollow	0.37	0.20	0.19	0.20
	Shaniko Plateau	0.81	0.52	0.06	0.09
	Toe Jam Creek	0.58	0.17	0.00	0.00
	9019219	0.02	0.02	0.00	0.00
<b>Thickspike wheatgrass</b>	Bannock	1.04	1.07	0.58	0.43
	Schwendimar	0.69	0.52	0.39	0.24
	Critana	0.90	0.56	0.24	0.17
	Sodar	0.37	0.30	0.15	0.07
<b>Slender wheatgrass</b>	Revenue	1.00	0.93	0.00	0.00
	San Luis	0.60	0.69	0.00	0.00
	Pryor	0.30	0.30	0.02	0.00
<b>Western wheatgrass</b>	Rodan	0.28	0.35	0.13	0.00
	Rosana	0.05	0.20	0.04	0.00
	Arriba	0.16	0.15	0.06	0.00
<b>Bluebunch wheatgrass</b>	Jim Creek	0.83	1.02	1.02	1.07
	Wahluke	0.97	1.26	1.02	0.98
	P-12	1.34	1.59	1.04	0.89
	Columbia	1.30	1.23	0.84	0.83
	Anatone	0.81	1.15	0.80	0.69
	P-7	0.93	1.15	0.67	0.57
	P-15	0.60	0.93	0.54	0.50
	Goldar	0.51	0.37	0.33	0.19
	P-5	0.42	0.61	0.22	0.13
<b>Snake River wheatgrass</b>	SERDP	1.02	0.94	0.67	0.70
	Secar	1.00	1.11	0.76	0.56
	Expedition	1.27	1.44	0.54	0.41
	E-26	0.21	0.23	0.22	0.13
<b>Basin wildrye</b>	Trailhead	0.60	0.52	0.26	0.17
	U100-01	0.53	0.41	0.11	0.13
	U108-02	0.56	0.57	0.24	0.11
	Washoe	0.21	0.09	0.09	0.06
	Magnar	0.28	0.22	0.04	0.04
	U70-01	0.30	0.22	0.02	0.02
<b>Sheep fescue</b>	Covar	0.16	0.00	0.07	0.07
	Initial Point	0.21	0.04	0.02	0.00
<b>Thurber's needlegrass</b>	Thurber's	0.00	0.00	0.00	0.00
<b>Sandberg bluegrass</b>	High Plains	0.25	0.00	0.54	0.00
	Sherman	0.00	0.00	0.02	0.00
	Mountain Home	0.00	0.00	0.35	0.00
	Toole County, MT	0.00	0.00	0.04	0.00
	Hanford Source	0.00	0.00	0.19	0.00

### Introduced Grasses

Although many of the introduced grass accessions had fair emergence, an outbreak of black grass bugs at the time of the first evaluation in 2005 was noted. The infestation appeared limited to the introduced grass section of the nursery. Plants were covered with yellow spots making the plants appear yellow-green overall. Although most of the stands of the introduced grasses decreased from the first to the second evaluation, many stands had recovered and increased by 2006 indicating that many plants thought to be dead during the second evaluation in 2005 were still alive. However, the plants of crested wheatgrass were very small when compared to the other wheatgrass accessions in the nursery and still appear to be recovering from black grass bug pressure. The 2007

evaluation showed all established plots with reduced densities, many accessions dropping out completely.

In 2006 all of the crested wheatgrass accessions increased in density or remained approximately where they were in 2005. Ephraim rose from 0.28 to 1.23 plants/ft<sup>2</sup>; however, many of the plants were small in size due to the black grass bug infestation during the spring of 2005. In 2007 the best density was obtained from Nordan with 0.67 plants/ft<sup>2</sup>. Ephraim had dropped from 1.23 to 0.02 plants/ft<sup>2</sup>.

Both Siberian wheatgrass accessions similarly increased from 2005 to 2006, but decreased in 2007. In 2007 Vavilov was down to 0.26 plants/ft<sup>2</sup> and P-27 had 0.00 plants/ft<sup>2</sup>.

The three pubescent wheatgrass accessions decreased from 2005 to 2006 with the highest density in 2006 coming from Maska at 0.28 plants/ft<sup>2</sup>. Maska continued to have the best density in 2007 with 0.13 plants/ft<sup>2</sup>.

Rush intermediate wheatgrass, had 0.00 plants/ft<sup>2</sup> in 2006 and 2007.

Prairieland and Eejay Altai wildrye had zero plants in 2006. Pearl Altai wildrye had 0.02 plants/ft<sup>2</sup>. In 2007 Prairieland and Eejay again had 0.00 plants/ft<sup>2</sup> and Pearl increased slightly to 0.04 plants/ft<sup>2</sup>.

The Russian wildrye accessions all increased in density with the exception of Tetracan which decreased slightly. The best stand was recorded in the Bozoisky Select plot with 0.58 plants/ft<sup>2</sup>. Bozoisky select had the best stand in 2007 with 0.35 plants/ft<sup>2</sup>. Bozoisky II had the next best rating with 0.26 plants/ft<sup>2</sup>.

Species	Name or accession	4/27/05	5/25/05	5/30/06	5/16/07
		-----Plants/ft <sup>2</sup> -----			
<b>Crested wheatgrass</b>	Nordan	1.30	1.19	1.10	0.67
	Roadcrest	1.30	0.07	0.52	0.19
	Hycrest	0.39	0.24	0.15	0.07
	Ephraim	0.65	0.28	1.23	0.02
	CD-II	0.56	0.24	0.20	0.00
	Douglas	0.28	0.04	0.09	0.00
<b>Siberian wheatgrass</b>	Vavilov	0.65	0.20	0.61	0.26
	P-27	0.09	0.02	0.33	0.00
<b>Pubescent wheatgrass</b>	Maska	0.69	0.65	0.28	0.13
	Greenleaf	0.60	0.59	0.15	0.09
	Luna	0.79	0.54	0.13	0.00
<b>Intermediate wheatgrass</b>	Rush	0.60	0.56	0.00	0.00
	Pearl	0.35	0.15	0.02	0.04
<b>Altai wildrye</b>	Prairieland	0.56	0.39	0.00	0.00
	Eejay	0.16	0.28	0.00	0.00
	Bozoisky Select	0.72	0.54	0.58	0.35
<b>Russian wildrye</b>	Syn-A (Bozoisky II)	0.21	0.13	0.24	0.26
	Mankota	0.46	0.28	0.32	0.19
	Tetracan	0.42	0.20	0.17	0.07

## Forbs and Shrubs

Despite some good stands in 2005, all of the forb and shrub accessions except for Eagle yarrow had zero plants during the 2006 evaluation. Eagle had 0.07 plants/ft<sup>2</sup> in the frequency grids along with a small stand of plants at one end of the seeded plot. In 2007 more plants of Eagle had either germinated from the original seeding, or seed had spread from established plants. Plant density for Eagle in 2007 equaled 0.24 plants/ft<sup>2</sup>. Snake River Plains fourwing saltbush also had a single plant found in the plots, increasing its density from 0.00 to 0.02 plants/ft<sup>2</sup>.

Species	Name or accession	4/27/05	5/25/05	5/30/06	5/16/07
		-----Plants/ft <sup>2</sup> -----			
Western yarrow	Eagle	0.51	0.50	0.07	0.24
	Great Northern	0.19	0.09	0.00	0.00
Utah sweetvetch	Timp	0.14	0.02	0.00	0.00
Firecracker penstemon	Richfield Selection	0.02	0.02	0.00	0.00
Scarlet globemallow		0.00	0.00	0.00	0.00
Lewis flax	Maple Grove	0.42	0.15	0.00	0.00
Blue flax	Appar	0.90	0.26	0.00	0.00
Wyoming big sagebrush		0.02	0.02	0.00	0.00
Fourwing saltbush	Snake River Plains	0.00	0.00	0.00	0.02
	Wytana	0.00	0.00	0.00	0.00
	Rincon	0.00	0.00	0.00	0.00
Gardner's saltbush	9016134	0.00	0.00	0.00	0.00
Winterfat	Hatch	0.28	0.17	0.00	0.00
	Northern Cold Desert	0.00	0.00	0.00	0.00
	Open Range	0.00	0.00	0.00	0.00
Forage kochia	Immigrant	0.00	0.00	0.00	0.00

## Cover Crop

The cover crop consisted of a four species mix which contained: 50% Anatone bluebunch wheatgrass, 20% Bannock thickspike wheatgrass, 20% Magnar basin wildrye and 10% Snake River Plains fourwing saltbush. Four grids were examined during the first evaluation in 2005, one on each side of the nursery, and five grids were evaluated at the time of the second evaluation in 2005 and the 2006 evaluation. Total plant density was estimated at 0.37 plants/ft<sup>2</sup> at the first evaluation and 0.57plants/ft<sup>2</sup> at the second evaluation. In 2006 the cover crop density was 0.13 plants/ft<sup>2</sup>. Cover crop densities increased in 2007 up to 0.20 plants/ft<sup>2</sup>.

## Discussion

Despite large amounts of Russian thistle, native and introduced grasses had fair to good emergence and plant density during the establishment year. Germination and emergence might have increased with more precipitation during March and April, 2005 but emergence was good with the rain that was received. The majority of the plots showed decreased stands from 2005 to 2006 and again into 2007. The low precipitation at the site, especially the lack of moisture in July and August every year seems to have eliminated many of the less drought tolerant accessions. One concern is the effect of black grass bugs on the introduced grasses. Plants subjected to black grass bug are normally affected by decreased seed yield and a reduction in palatability. Infestations rarely result in the death of established plants, but in low water years establishing plants



may be under enough stress to kill the establishing seedlings (Hammon and Peairs 2001). The second evaluation in 2005 indicated a loss in plant densities; however it appears that many of the plants survived, although stunted, through 2006. In 2007 many more plants had died out leaving poor or no stands in many plots. Snake River and blue bunch wheatgrass had consistently good stands from essentially all accessions. Introduced species like crested wheatgrass and Russian wildrye also had good performers such as Nordan and Bozoisky select.

Future evaluations will provide more information on plant establishment, persistence and longevity. The PMC staff will continue to evaluate plant performance at the site.

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### **Develop Technology to Improve the Diversity of Introduced Grass Stands**

The PMC assisted Brigham Young University (BYU) Provo, UT and the Agricultural Research Service (ARS) Burns, OR in developing technology to improve the diversity of introduced grass stands by evaluating methods to introduce native species into established introduced plant communities. In 2005, the PMC modified a Truax Rough Rider range drill, mixed the seed and rice hull mixtures and completed the first year of seedings at sites in Utah and Oregon. In 2006, modified seed drop boots by the manufacturer were installed on the Truax drill and the second year of seeding was completed. In addition to these seedings, the PMC also seeded drill comparison trials near Elko, NV on recently burned rangeland to compare the Truax drill to the Kemmerer drill, a standard range drill used by BLM. The Truax drill is designed to both broadcast and drill seed in the same pass so species that require broadcasting or very shallow planting depth were broadcast and the deeper seeded species were drill seeded in alternating rows.

In 2007, seeding trials were scheduled to be planted near Elko, NV. However, seedbed preparation was unable to be completed. Trials have been rescheduled to the fall of 2008.

## Equipment and Strategies to Enhance the Post-wildfire Establishment and Persistence of Great Basin Native Plants

The objectives of this project are to: examine seeding techniques for Wyoming big sagebrush; test seeding technology for native species, particularly native forbs; compare the ability of a modified rangeland drill and an experimental minimum-till drill to plant native seeds of diverse size and to reduce surface disturbance; apply and examine the use of USGS proposed monitoring protocols for gauging seeding success for both the short and long term; and provide plantings for long-term examination of livestock on diversity in native seedings.

The minimum-till drill (Truax Rough Rider range drill) which has been modified by PMC personnel was provided by the FS Rocky Mountain Research Station. The PMC provided a trailer and tractor and the Utah Division of Wildlife provided an additional tractor. The modified rangeland drill (Kemmerer range drill) was provided by the BLM.

The PMC mixed the seed and rice hull mixtures and calibrated the drills prior to seeding. The PMC also made a modification to the Kemmerer drill by replacing the existing drop tubes with used aluminum 3 inch diameter irrigation pipe to facilitate seed flow to the drill openers. The aluminum pipe provided a more slippery surface for the seed to flow. The drills were set up to both broadcast and drill seed in the same pass so species that require broadcasting or very shallow planting were broadcast and the deeper seeded species were drill seeded in alternating rows.

Wildfire sites near Mountain Home, ID and Burns, OR were seeded during the week of October 28, 2007. A total of approximately 184.3 acres were seeded in plots to the following mixes:

### Cover Crop Mix

24.3 acres

Species	Pounds PLS/ac	Pounds Bulk Seed/ac
Rimrock Indian ricegrass	4.5	5.25
Anatone bluebunch wheatgrass	4.0	4.64
Rice Hulls		6.16

### Drill Mix

80.0 acres

Species	Pounds PLS/ac	Pounds Bulk Seed/ac
Rimrock Indian ricegrass	1.0	1.17
Munro globemallow	0.50	0.94
Anatone bluebunch wheatgrass	2.0	2.32
Toe Jam Cr. b. squirreltail	1.0	1.09
Sulphurflower buckwheat	0.24	0.39
Rice Hulls		1.79

**Mountain Home 10X Broadcast Mix**

5 acres

<u>Species</u>	Pounds <u>PLS/ac</u>	Pounds <u>Bulk Seed/ac</u>
Wyoming big sagebrush	1.30	6.22
Rubber rabbitbrush	0.50	1.85
Hotrock penstemon	0.09	0.16
Mtn. Home Sandberg bluegrass	0.40	0.48
Rice Hulls		5.05

**Mountain Home 5X Broadcast Mix**

30 acres

<u>Species</u>	Pounds <u>PLS/ac</u>	Pounds <u>Bulk Seed/ac</u>
Wyoming big sagebrush	0.65	3.11
Rubber rabbitbrush	0.50	1.85
Hotrock penstemon	0.09	0.16
Mtn. Home Sandberg bluegrass	0.40	0.48
Rice Hulls		5.05

**Mountain Home Standard Broadcast Mix**

5 acres

<u>Species</u>	Pounds <u>PLS/ac</u>	Pounds <u>Bulk Seed/ac</u>
Wyoming big sagebrush	0.13	0.62
Rubber rabbitbrush	0.50	1.85
Hotrock penstemon	0.09	0.16
Mtn. Home Sandberg bluegrass	0.40	0.48
Rice Hulls		3.54

**Burns 10X Broadcast Mix**

5 acres

<u>Species</u>	Pounds <u>PLS/ac</u>	Pounds <u>Bulk Seed/ac</u>
Wyoming big sagebrush	0.95	3.25
Rubber rabbitbrush	0.50	1.85
Hotrock penstemon	0.09	0.16
Mtn. Home Sandberg bluegrass	0.40	0.48
Rice Hulls		8.03

**Burns 5X Broadcast Mix**

30 acres

<u>Species</u>	Pounds <u>PLS/ac</u>	Pounds <u>Bulk Seed/ac</u>
Wyoming big sagebrush	0.45	1.54

Rubber rabbitbrush	0.50	1.85
Hotrock penstemon	0.09	0.16
Mtn. Home Sandberg bluegrass	0.40	0.48
Rice Hulls		6.62

### **Burns Standard Broadcast Mix**

5 acres

Species	Pounds PLS/ac	Pounds Bulk Seed/ac
Wyoming big sagebrush	0.10	0.34
Rubber rabbitbrush	0.50	1.85
Hotrock penstemon	0.09	0.16
Mtn. Home Sandberg bluegrass	0.40	0.48
Rice Hulls		3.81

It is planned to be repeat these trials in the fall of 2008. Location of the trials to be determined based on areas that burn during the 2008 fire season.

#### **Publications**

(Available online at <http://plant-materials.nrcs.usda.gov/idpmc/publications.html>)

St. John, L, Cornforth, B., Simonson, B., Ogle, D. and D. Tilley. 2007. Technical Note 20: Calibrating the Truax Rough Rider Drill for Restoration Plantings. Aberdeen Plant Materials Center, Aberdeen, ID. December 10, 2007. 14p.

Tilley, DJ, St. John, L, and DG Ogle. 2007. Great Basin Native Plant Selection and Increase Activities at the Aberdeen, Idaho Plant Materials Center. Aberdeen Plant Materials Center, Aberdeen, ID. January 18, 2007. 1p.

Tilley, D.J., Ogle, D.G. and L. St. John. 2007. Parsnipflower Buckwheat Plant Guide. Aberdeen Plant Materials Center, Aberdeen, ID. March 30, 2007. 3p.

Tilley, D.J. and L. St. John 2006. Orchard Display Nursery Evaluation Summary (2005-2006). Aberdeen Plant Materials Center, Aberdeen, ID. October 24, 2006. 6p.

Tilley, D.J. 2007. Reintroducing native plants to the American West. Aberdeen Plant Materials Center, Aberdeen, ID. February 20, 2007. 2p.

St. John, L., Tilley, D.J. and D.G. Ogle. 2006. Plants for Solving Resource Problems - Anatone Germplasm Bluebunch Wheatgrass. Aberdeen Plant Materials Center, Aberdeen, Idaho. October 12, 2006. 2p. Release Brochure.

St. John, L., Tilley, D.J. and D.G. Ogle. 2006. Plants for Solving Resource Problems -

Maple Grove Flax. Aberdeen Plant Materials Center, Aberdeen, Idaho. November 13, 2006. 2p. Release Brochure.

St. John, L., Tilley, D.J. and D.G. Ogle. 2006. Plants for Solving Resource Problems - Northern Cold Desert Winterfat. Aberdeen Plant Materials Center, Aberdeen, Idaho. November 15, 2006. 2p. Release Brochure.

St. John, L., Tilley, D.J., and D.G. Ogle. 2006. Plants for Solving Resource Problems - Snake River Plains Germplasm Fourwing Saltbush. Aberdeen Plant Materials Center, Aberdeen, ID. November 7, 2006. 2p. Release Brochure.

St. John, L. 2006. Great Basin Native Plant Selection and Increase Project - 2006 Annual Report. Aberdeen Plant Materials Center, Aberdeen, Idaho. December 19, 2006. 11p.

### **Presentations**

Date: 2/15/2007

Title: Aberdeen PMC report of Activities 2006: Great Basin native plant selection and increase project

Presenter: Derek Tilley

Location: Society for Range Management annual meeting, Reno, NV

### **Management Applications**

1. Certified seed stock of Anatone bluebunch wheatgrass, Snake River Plains fourwing saltbush, and Northern Cold Desert winterfat produced by the PMC is available through the University of Idaho Foundation Seed Program and Utah Crop Improvement Association.
2. Based on propagation studies at the PMC, sulphurflower buckwheat, hotrock, sagebrush and sharpleaf penstemon appear to be able to be commercially grown, at least with the use of weed barrier fabric. Lomatium species are taking a long time to mature to reproductive stage and may not be conducive to commercial production because of the long period to reach reproductive capability.
3. The Orchard Display Nursery has been established for 3 years. The best performing native accessions identified in 2007 are: Fish Creek germplasm bottlebrush squirreltail, 'Bannock' thickspike wheatgrass, Jim Creek germplasm bluebunch wheatgrass, SERDP Snake River wheatgrass, 'Trailhead basin wildrye, Eagle germplasm western yarrow and Snake River Plains germplasm fourwing saltbush.

## **Products**

1. Certified seed stock of Anatone bluebunch wheatgrass, Snake River Plains fourwing saltbush, and Northern Cold Desert winterfat produced by the PMC is available through the University of Idaho Foundation Seed Program and Utah Crop Improvement Association
2. Seed of sulphurflower buckwheat and hotrock penstemon that were produced from the propagation studies were planted in the seed mixtures for the post-wildfire establishment study.
3. Technical Note 20: Calibrating the Truax Rough Rider Drill for Restoration Plantings was developed and should be a useful guide to calibrating the drill.