



**UNIVERSITY OF WYOMING-FRANCIS E. WARREN AIR FORCE BASE
YEAR 2006 SUMMARY REPORT**

prepared by

**NATURAL RESOURCES CONSERVATION SERVICE
BRIDGER PLANT MATERIALS CENTER**

INTRODUCTION: The Bridger Plant Materials Center (BPMC) has worked cooperatively with the University of Wyoming at Powell, WY, the Francis E. Warren Air Force Base at Cheyenne, WY, and Dr. Tom Whitson to develop production systems and technologies for the restoration of disturbances at the Base since fall 2002. These activities primarily involve the testing, evaluation, and increase of native species indigenous to the base. Seed collected by the Air Force has been used to produce plants for field testing, as well as seed production. Plants produced at Bridger are forwarded to commercial seed growers for further increase.

ACCOMPLISHMENTS: In 2006, the BPMC maintained two field plots related to Air Force base restoration activities. A prairie coneflower *Ratibida columnifera* row-spacing study installed by graduate student Myrna Ulmer was irrigated, weeded, and fertilized in 2006 in order to maintain seed production and provide information on stand longevity. Seed was harvested from the plot, cleaned, and is currently stored at the BPMC. In 2006, the BPMC continued to maintain a small field emergence study completed in 2004 for seed production. All incidental production of seed from both studies in 2006 appears in Table 1. In addition, seed produced at the Powell Research and Extension Center (PREC) was also cleaned and returned to the station on December 15, 2006. All seed cleaned for the PREC appears in Table 2. The BPMC also maintains the remainder of the original wildland collections made in 2001 at the base, as well as several miscellaneous small lots produced at the BPMC since 2003 (see Appendix 1).

Table 1. Year 2006 seed production at the BPMC held in storage, February 8, 2007, Bridger PMC, Bridger, MT.

Accession Number	Species	Lot Number	Production Location	Date(s) Collected	Amount of Seed
					<i>kg</i>
9087379	<i>Astragalus drummondii</i>	SCO-06-WAFB	F4-BPMC	6/23/06	0.023
9082283	<i>Erysimum inconspicuum</i>	SCO-06-WAFB	F4-BPMC	6/23-7/14/06	0.080
9087382	<i>Helianthus pumilus</i>	SCO-06-WAFB	F4-BPMC	7/3-8/17/06	0.108
9087384	<i>Lupinus argenteus</i>	SCO-06-WAFB	F4-BPMC	6/20-7/17/06	0.062
9082282	<i>Penstemon albidus</i>	SCO-06-WAFB	F4-BPMC	7/3-8/29/06	0.018
9082284	<i>Ratibida columnifera</i>	SCO-06-WAFB	F4-BPMC	7/24-8/29/06	0.453
9087385	<i>Rudbeckia hirta</i>	SCO-06-WAFB	F4-BPMC	7/17-8/10/06	0.197

Table 2. Year 2006 seed production at the Powell R & E cleaned at the, Bridger PMC, Bridger, MT.

Accession Number	Species	Lot Number	Production Location	Date(s) Collected	Amount of Seed
					<i>kg</i>
9082283	<i>Erysimum inconspicuum</i>	SCO-06-WAFB	Powell, WY	2006	3.52
9082284	<i>Ratibida columnifera</i>	SCO-06-WAFB	Powell, WY	2006	181.44
9087385	<i>Rudbeckia hirta</i>	SCO-06-WAFB	Powell, WY	2006	0.81

Beginning on December 13, 2005, 4,800 4-cubic-inch containers of 4 lots were sown in Sunshine Mix #1 as specified in Table 3 and Appendix 2. It was eventually determined *Penstemon angustifolium* (9082281-2004) was in fact a mislabeled collection of *P. albidus* (9082282), and the two lots were bulked together. On December 29, 2005, the *Penstemon albidus* (9082282), *Penstemon angustifolium* (9082281), and *Rudbeckia hirta* (9087385) trays were moved to a 35°F walk-in cooler for a cold:moist chilling period to break dormancy. On the same date, the *Helianthus pumilus* (9087382) was moved to a hoop house maintained at 35 to 40°F for a cold:moist chilling period to break dormancy. The trays were inspected weekly for sign of germination.

Table 3. Containers sown for field seed increase, January 18, 2006, Bridger PMC, Bridger, MT.

Accession Number	Species	Seed Lot	Seed Sown	Cone Size	Number of Containers Sown
			<i>g</i>	<i>cubic inch</i>	
9082282	<i>Penstemon albidus</i>	2001	3.53	4	1200
9082281	<i>Penstemon angustifolium</i>	2004	4.68	4	1200
9087382	<i>Helianthus pumilus</i>	2001	10.36	4	1200
9087385	<i>Rudbeckia hirta</i>	2003	1.90	4	1200

On February 3, 2006, the *Rudbeckia hirta* began to germinate and were relocated to a greenhouse maintained on 16-hour days at 70 to 80°F, and 8-hour nights at 60 to 65°F. On March 2, 2006, the two penstemon lots also began showing signs of germination and were moved to a greenhouse. The *Helianthus pumilus* was left in the hoop house and allowed to grow under ambient conditions. The *Helianthus pumilus* and *Rudbeckia hirta* seedlings were transplanted from the 4-cubic-inch containers to 10-cubic-inch containers because of their rapid growth and large size. All plants were eventually moved to outdoor benches or a 50% shade house for hardening-off (acclimatization). A total of 4,303 container plants were produced in 2006 and delivered to Wind River Seed, Manderson, Wyoming on May 25, 2006, for lining out for field seed increase (see Table 4 and Appendix 3). This number included 454 *Nassella viridula* (9082286) and 331 *Hesperostipa comata* (9082287) that were by-products of dormancy research that was conducted on these two species at the BPMC. The produced species were targeted for increase because their stature, growth, and seed production characteristics lend themselves to efficient commercial cultivation.

Table 4. Plants delivered to Wind River Seed for field seed increase, May 25, 2006.

Accession Number	Species	Lot Number	Seed Lot	Plant Age	Cone Size	Number of Plants Delivered
					<i>cubic inch</i>	
9082282	<i>Penstemon albidus</i>	VCO-06-WAFB	2001	1-0	4	1,530
9082286	<i>Nassella viridula</i>	VCO-06-WAFB	2001	1-0	4	454
9082287	<i>Hesperostipa comata</i>	VCO-06-WAFB	2001	1-0	4	331
9087382	<i>Helianthus pumilus</i>	VCO-06-WAFB	2001	1-0	10	808
9087385	<i>Rudbeckia hirta</i>	VCO-06-WAFB	2003	1-0	10	1,180

TECHNOLOGY DEVELOPMENT: No new research was initiated on this project in 2006. The need for field establishment trials at the WAFB was identified. A possible schedule of events in 2007 and 2008 might include the following:

Spring 2007:

- I. Site Visit
- II. Preliminary Weed Control Measures for 2007
- III. Land Preparation (leveling, tillage, plowing)
- IV. Soil Amendment (if necessary)
- V. Install Animal Protection (fencing)
- VI. Design Study (determine special needs-mulching, snowfence, dormancy-breaking, etc)
- VII. Procure Seed of Commercially Available Species (Lodorm etc.)

Fall 2007:

- I. Install Planting
- II. Evaluate Weed Invasion (spray/mow/hand rogue if necessary)

Spring and/or Summer and/or Fall 2008

- I. Site Evaluation(s)
- II. Weed Control
- III. Animal Control

Appendix 1. Seed held in inventory at the Bridger PMC, February 13, 2007, Bridger, MT.

AccessionRelease	Lot Number	Bin Number	Current Test Date	Purity	Total Viability	PLS%	Quantity On Hand Bulk
Achnatherum hymenoides (ACHY) / Indian ricegrass							
9082285	SWC-01-WAFB						42.09 g
Argemone hispida (ARHI4) / rough pricklypoppy							
9087378	SCO-04-WAFB	base					5.00 g
9087378	SCO-05-WAFB	base		0.00			8.00 g
9087378	SWC-01-WAFB						46.01 g
Astragalus drummondii (ASDR3) / Drummond's milkvetch							
9087379	SCO-05-WAFB	base		0.00			86.00 g
9087379	SCO-06-WAFB	base		0.00			23.00 g
9087379	SWC-01-WAFB						79.21 g
Erigeron pumilus ssp. pumilus (ERPUP3) / shaggy fleabane							
9087380	SCO-04-WAFB	base					36.00 g
9087380	SCO-05-WAFB	base		0.00			3.00 g
9087380	SWC-01-WAFB						0.49 g
Eriogonum flavum var. flavum (ERFLF) / alpine golden buckwheat							
9082280	SWC-01-WAFB						36.43 g
9082283	SCO-03-WAFB						1.90 g
Erysimum inconspicuum (ERIN7) / shy wallflower							
9082283	SCO-05-WAFB	base		0.00			27.00 g
9082283	SCO-06-WAFB	base		0.00			80.00 g
9082283	SWC-01-WAFB						30.86 g
Harbouria trachypleura (HATR) / whiskbroom parsley							
9087381	SCO-04-WAFB	base					2.00 g
9087381	SWC-01-WAFB						57.27 g
Helianthus pumilus (HEPU3) / little sunflower							
9087382	SCO-03-WAFB						22.30 g
9087382	SCO-04-WAFB	base					5.00 g
9087382	SCO-05--WAFB	base		0.00			271.00 g
9087382	SCO-06-WAFB	base		0.00			108.00 g
9087382	SWC-01-WAFB						16.50 g
Hesperostipa comata (HECO26) / needle and thread							
9082287	SWC-01-WAFB						5.29 g
Lupinus argenteus ssp. argenteus var. argenteus (LUARA11) / silvery lupine							
9087384	SCO-06-WAFB	base		0.00			62.00 g
9087384	SWC-01-WAFB						2.17 g
Nassella viridula (NAVI4) / green needlegrass							
9082286	SWC-01-WAFB						32.89 g

Bin Current Total Quantity On Hand

AccessionRelease	Lot Number	NumberTest	Date Purity	Viability	PLS%	Bulk
Penstemon albidus (PEAL2) / white penstemon						
9082282	SCO-04-WAFB	base				57.00 g
9082282	SCO-04-WAFBB	base				21.00 g
9082282	SCO-05-WAFB	base	0.00			94.00 g
9082282	SCO-06-WAFB	base	0.00			18.00 g
9082282	SWC-01-WAFB					11.57 g
Penstemon angustifolius (PEAN4) / broadbeard beardtongue						
9082281	SCO-04-WAFB	base				62.32 g
Ratibida columnifera (RACO3) / upright prairie coneflower						
9082284	SCO-05-WAFBA	base	0.00			2.19 lbs
9082284	SCO-05-WAFBB	base	0.00			5.65 lbs
9082284	SCO-06-WAFB	base	0.00			453.00 g
9082284	SWC-01-WAFB					15.34 g
Rudbeckia hirta var. pulcherrima (RUHIP) / blackeyed Susan						
9087385	SCO-03-WAFB					42.70 g
9087385	SCO-05-WAFB	base	0.00			306.00 g
9087385	SCO-06-WAFB	base	0.00			197.00 g
Sphaeralcea coccinea (SPCO) / scarlet globemallow						
9087386	SWC-01-WAFB					37.83 g
Tetraneuris acaulis var. acaulis (TEACA2) / stemless four-nerve daisy						
9087387	SWC-01-WAFB					1.97 g
Townsendia grandiflora (TOGR) / largeflower Townsend daisy						
9087388	SCO-04-WAFB	base				73.00 g
9087388	SWC-01-WAFB					3.26 g

DISTRIBUTION AND DELIVERY RECORD Bridger Plant Materials Center, Bridger, MT

D&D Joe Scianna
USDA-NRCS
Bridger Plant Materials Center
98 South River Rd.
Bridger, MT 59014-9718
Phone: (406) 662-3579; Fax: (406) 662-3428

Ship To: Joe Scianna
USDA-NRCS
Bridger Plant Materials Center
98 South River Rd.
Bridger, MT 59014-9718
Phone: (406) 662-3579; Fax: (406) 662-3428

Order Date: 2/8/2007
 ECS-1 Number:

Ship Date: 2/8/2007
 Ship via: Pick-up

Number of Packages: 0

D&D MTPMC-07-006

Accession U/M	Scientific Name (Symbol) / Lot Number	Cert Class	Age	Test Date Purity	Total Viab	Bulk Shipped	PLS Shipped	
9082281	Penstemon angustifolius (PEAN4) / broadbeard beardtongue SCO-04-WAFB	CO				4.68	0	g
9082282	Penstemon albidus (PEAL2) / white penstemon SWC-01-WAFB	WC				3.53	0	g
9087382	Helianthus pumilus (HEPU3) / little sunflower SWC-01-WAFB	WC				10.36	0	g
9087385	Rudbeckia hirta var. pulcherrima (RUHIP) / blackeyed Susan SCO-03-WAFB	CO				1.9	0	g

Remarks: Seed used in 2006 for container production for Wind River Seed.

PLEASE SIGN AND RETURN ONE COPY TO:

Bridger Plant Materials Center
98 South River Rd.
Bridger, MT 59014-9718
 Phone:(406) 662-3579
 Fax:(406) 662-3428

For PMC Use

D &D Joseph Scianna
 Purpose: Grower Increase
 Field Planting #:
 Study #:
 Ordered By: MTPMC
 Ordered Filled By: Joseph Scianna

DISTRIBUTION AND DELIVERY RECORD Bridger Plant Materials Center, Bridger, MT

D&D Rick Dunne
Wind River Seed
3075 Lane 51 1/2
Manderson, WY 82432
Phone: (307) 568-3361

Ship To: Rick Dunne
Wind River Seed
3075 Lane 51 1/2
Manderson, WY 82432
Phone: (307) 568-3361

Order Date: 5/25/2006
 ECS-1 Number:

Ship Date: 5/25/2006
 Ship via: Delivered

Number of Packages: 1

D&D MTPMC-06-060

Accession U/M	Scientific Name (Symbol) /	Lot Number	Cert Class	Age	Test Date	Purity	Total Viab	Bulk Shipped	PLS Shipped	
9082282	Penstemon albidus (PEAL2) / white penstemon	VCO-06-WAFB	CO	1-0		0		1530	0	ea
9082286	Nassella viridula (NAVI4) / green needlegrass	VCO-06-WAFB	CO	2-0		0		454	0	ea
9082287	Hesperostipa comata (HECO26) / needle and thread	VCO-06-WAFB	CO	2-0		0		331	0	ea
9087382	Helianthus pumilus (HEPU3) / little sunflower	VCO-06-WAFB	CO	1-0		0		808	0	ea
9087385	Rudbeckia hirta var. pulcherrima (RUHIP) / blackeyed Susan	VCO-06-WAFB	CO	1-0		0		1180	0	ea

Remarks: Plants for seed increase at Wind River Seed for WAFB.

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Bridger, MT 59014-9718
 Phone: **(406) 662-3579**
 Fax: **(406) 662-3428**

For PMC Use

D & D Joseph Scianna
 Purpose: Grower Increase
 Field Planting #:
 Study #:
 Ordered By: MTPMC
 Ordered Filled By: Shannon Majerus