

CORVALLIS PLANT MATERIALS CENTER
NATURAL RESOURCES CONSERVATION SERVICE
CORVALLIS, OREGON

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**THE 2007 US ARMY/OREGON MILITARY DEPARTMENT ANNUAL
REPORT:**

Camp Rilea Seed Increase Project

I. Brief Background of Project

The Corvallis Plant Materials Center (PMC) entered into a new agreement with the US Army (specifically with the Oregon Military Department (OMD) in 2007 to increase seed of early blue violet (*Viola adunca*) for use in recovery efforts for the Oregon silverspot butterfly (*Speyeria zerene hippolyta*). The butterfly is now extirpated from Camp Rilea due to the loss of disturbance in its coastal meadow habitat. The early blue violet is the obligate host to the silverspot caterpillars and has also been negatively impacted in its coastal meadow ranges by the encroachment of tall, spreading exotic plants. Seed increase on the violets will provide a source for future seedling grow-outs which can then be transplanted back into areas of Oregon silverspot butterfly habitat enhancement and restoration. Production of nectar plants or other matrix species will be added to this agreement if seeds and funds become available.



Figure 1. Plant Materials Center and Oregon Military Department staff collecting *Viola adunca* seed at Camp Rilea, June 4, 2007.

II. Accessions Involved

The table below lists the accessions involved in this project. Activities in 2007 included seed collection and cleaning of three species, production of violets, and germination trials.

Table 1. Accessions in the Camp Rilea seed increase project.

Species	Common name	Symbol	Accession	Activity in 2007 ¹
<i>Viola adunca</i>	early blue violet	VIAD	9079558	col, pxn
<i>Carex pansa</i>	dune sedge	CAPA16	9079563	trl
<i>Solidago simplex</i> ssp. <i>simplex</i> var. <i>spathulata</i>	dune goldenrod	SOSIS4	9079532	trl

¹- trl= germination trials, col= wild seed collection, pxn=plant production

III. Seed Collections

On June 4th, 2007 PMC staff and OMD staff traveled to Camp Rilea to collect violet seeds. *V. adunca* seeds were collected from many areas across the base. OMD staff returned to collect more seeds on June 20th, 2007. Collections from each Area (defined by OMD maps) and each date were kept separately in paper envelopes in an open greenhouse (used as a drying shed).

Table 2. Native seed collections in 2007 for the Camp Rilea seed increase project.

Species	Accession	Collection dates	Amount collected	Seeds/lb
<i>Viola adunca</i>	9079558	June 6, June 20	15 g	470,000
<i>Carex pansa</i>	9079563	Sept 20- Oct 4	2356 g	540,000
<i>Solidago simplex</i> ssp. <i>simplex</i> var. <i>spathulata</i>	9079532	Sept 9- Dec 18	105 g	2,000,000

Carex pansa seeds were collected by OMC staff on September 20 and October 4th, 2007. Seeds do not shatter easily and can be harvested successfully for months after seeds are mature. Germination trials began in late September and the seed will be sown into a seed increase field in the spring. The goldenrod was collected many times during the late summer and early fall. OMD staff collected early, mid, and late blooming plants. Seed was cleaned at the PMC and will be used to grow containerized plants in 2008.

IV. Germination Trials

C. pansa has never been propagated at the PMC, therefore informal germination trials were performed. Replications of 100 seeds were counted and placed under different stratification periods. Seeds in the warm treatment (80° F days/ 65° F nights) showed some germination after 4 weeks, but germination was less than 10% for each of the three replications after 10 weeks. The 45 or 90-day cold stratification treatment did not

improve germination. It was then inferred that the seeds may have a physical dormancy rather than a physiological dormancy.

Table 3. Stratification trials on *Carex pansa* for the Camp Rilea seed increase project.

Treatment	Rep	% Germination	Notes
Warm, no scarification	1	9	Germination occurred between 35-60 days after sowing
	2	11	
	3	12	
45 day cold stratification, no scarification	1	10	Germination occurred 10-20 days after removal from the cooler
	2	12	
	3	11	
90 day cold stratification, no scarification	1	12	Germination occurred between 10-20 days after removal from the cooler
	2	9	
	3	10	

A Forsburg seed scarifier was used to de-hull the seeds. The hulls of *C. pansa* are extremely hard to remove. The seeds were placed in the scarifier for varying amounts of time and then placed in a warm growth chamber (80° F days/ 65°F nights). Three minutes in the scarifier seemed to de-hull a high percentage (approximately 75%) of the seed. In this treatment, the de-hulled seeds were selected for the germination trial. There were no broken or chipped seeds using this time interval.

Table 4. Scarification trials on *Carex pansa* for the Camp Rilea seed increase project.

Treatment	Rep	Germination		Notes
		%		
Warm, scarify for 30 seconds	1	3		Germination occurred 10-20 days after sowing
	2	6		
	3	4		
Warm, scarify for 1 minute	1	6		Germination occurred 10-20 days after sowing
	2	9		
	3	5		
Warm, scarify for 2 minutes	1	6		Germination occurred 17-20 days after sowing
	2	8		
	3	7		
Warm, completely deulled	1	56		Germination occurred 5-12 days after sowing
	2	62		

Seeds that received scarification but were not completely de-hulled did not show an improvement in germination. These tests were concluded after 21 days; the stratification trials were observed for 2 months. This explains the slightly higher germination in the warm treatment without scarification versus the warm treatments with scarification. The de-hulled seeds readily germinated (within five days). It is concluded that seeds must be completely de-hulled before sowing into a seed increase field and will germinate in warm temperatures. De-hulled seed will be sown into the seed increase field in late spring.

There are approximately 540,000 hulled *C. pansa* seeds per pound. De-hulled seed weighs considerably less and there are approximately 1,540,000 de-hulled seeds per pound. This needs to be considered when determining seeding rates.

Solidago simplex ssp. *simplex* var. *spathulata* seeds were germinated in a warm (75-80° F) growth chamber. The seeds germinated within two weeks and germination was 65% for the wild collected seed lot.

V. Container Plant Production



After drying, *V. adunca* seeds were cleaned using small hand screens and placed in germination boxes on moistened germination paper. Boxes were left in a walk-in cooler (40° F) for 120 days for cold-moist stratification to break seed dormancy. Boxes were removed on October 15, 2007.

Figure 2. *Viola adunca* flowering in the Corvallis Plant Materials Center greenhouse, December 30, 2007.

Table 5. *V. adunca* plants produced for the Camp Rilea seed increase project.

Collection Area	Collection date	Number of germinants	Number of plants produced
Area 1	June 4	17	15
Area 1	June 20	39	37
Area 3	June 4	105	92
Area 4	June 20	53	50
Area 9	June 4	190	170
Area 9 (white flowers)	June 20	0	0
Area 10	June 4	175	168
Area 10	June 20	247	229
Area 10 (lavender flowers)	June 20	133	127

Germination was recorded daily and germinating seedlings were transplanted into Ray Leach “stubby” cone-tainers filled with moistened media (Sunshine #1, a special peat-based soil-less mix) amended with a balanced slow-release fertilizer and micronutrients. Racks of cone-tainers were placed in a greenhouse set at moderate temperatures (75° F days 50° F nights) and 12 hours of light. Plants began to flower on December 19, 2007. Seeds will be collected from these plants and will be used to grow seedlings to be transplanted out at Camp Rilea.

VI. Delivery of Materials

There were no deliveries to OMD in 2007.