

CORVALLIS PLANT MATERIALS CENTER
NATURAL RESOURCES CONSERVATION SERVICE
CORVALLIS, OREGON
Sonja Johnson

February 10, 2006

THE 2005 US FISH AND WILDLIFE ANNUAL REPORT:
Viola adunca Seed Increase Project

I. Brief Background of Project

The Corvallis Plant Materials Center (PMC) entered into a new agreement with US Fish and Wildlife in 2005 to increase seed of early blue violet (*Viola adunca*) for use in recovery efforts for the Oregon silverspot butterfly (*Speyeria zerene hippolyta*). The butterfly has become threatened due to the degradation and loss of its coastal meadow habitat. The early blue violet is the obligate host to the silverspots' 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.

Activities in 2005 included salvaging violet plants from a construction site, potting up and maintaining plants, and harvesting and cleaning seed. Germination trials were performed to determine optimum seed propagation methods.



Figure 1. Oregon silverspot butterfly nectaring on Canada goldenrod at Cascade Head in Oregon



Figure 2. *Viola adunca*, host plant for Oregon silverspot butterfly larvae

II. Accessions Involved

SCIENTIFIC NAME	COMMON NAME	SYMBOL	ACCESSION #	# PLANTS	SEEDS PRODUCED
<i>Viola adunca</i>	early blue violet	VIAD	9079406	189	535 grams

III. Containerized Seed Increase

On April 14th, 2005, staff from the PMC and US Fish and Wildlife salvaged violet plants from a private lot on the Oregon coast. The collection location was recently cleared, allowing the violets to grow with minimal competition, and was in close proximity to many of the sites being considered for butterfly habitat restoration. Plants were dug out and placed in plastic bags or coolers for transportation back to the PMC. There, they were potted into 5-inch square pots filled with Sunshine #1 (a peat-based soil-less media) amended with micronutrients (MicroMax) and a slow-release fertilizer (Osmocote 14-14-14). A total of 189 plants were planted, 108 of which were placed in an outdoor shadehouse with the remaining 81 being placed in a greenhouse to determine whether or not the warmer temperatures of the greenhouse would encourage increased plant growth or earlier flowering. Plants were watered as necessary and growth was monitored. The violets in the greenhouse were slightly more rapid in development and seed harvest began on the 4th of May. As temperatures began to rise the plants were consolidated into the cool of the shadehouse and put onto an automatic drip irrigation system. Seed harvest continued daily throughout the summer and into early October. On September 21st, US Fish and Wildlife staff picked up approximately 100 violet plants to deliver to four recovery sites on the coast.



Figure 3. *Viola adunca* in PMC greenhouse



Figure 4. Violet seed pod ready to be harvested (left) and unripe seed pod (right)

Seeds were determined ready to harvest when the capsule they were in turned to point upward. Observation led to the belief that this stage immediately precedes the seed pod splitting open, at which time seeds can be lost. Ripe pods were pinched from their stems and put in a cloth bag in the greenhouse to dry. As they dried, most of the harvested capsules split and the seeds were easily separated from the majority of their pods by shaking the bag to settle the seeds at the bottom. Final cleaning was performed using an air screen machine, yielding 535 grams of seed.

IV. Experimental Propagation

Germination trials were performed on the early blue violet seed produced in 2005 to determine how many days of cold moist stratification is optimum for seed propagation. Trials were conducted by counting out 100 seeds onto moistened germination paper set in plastic boxes and placing three sets of three boxes each into a walk-in cooler set at fluctuating temperatures (16 hours 50°F, 8 hours 40°F) and 8 hours of light. Each set was then removed after either 60, 90, or 120 days and seeds were counted as they germinated. Results of the germination trials suggest that *Viola adunca* seeds respond most favorably in both mean germination and consistency between repetitions to 120 days of cold moist stratification.

Table 1. Results of *Viola adunca* germination trial testing various durations of cold moist stratification

STRAT (days)	REP #	TOTAL GERM (%)	MEAN GERM (%)
60	1	49	59
	2	60	
	3	68	
90	1	72	76
	2	76	
	3	80	
120	1	86	86
	2	86	
	3	86	

V. Delivery of Materials

One hundred violet plants were picked up from the PMC by US Fish and Wildlife staff in September, leaving 89 plants for continued seed production. The violets remaining at the PMC will be planted out into a field plot covered with weed control fabric. Hand harvesting of the violet seeds was effective but inefficient and the seeds produced in 2006 will be allowed to drop from their split capsules onto the fabric. They will then be collected using hand-held vacuums.

Approximately 35 grams of seed produced in 2005 were taken by US Fish and Wildlife staff for use in seeding trials. The remaining 500 grams are stored at the PMC and will be used to produce violet plants for transplanting into recovery sites in 2006. Seed remaining will be stored for direct seedings and/or plant production in later years.