Table 1.Germination enhancement treatments.

Table 3. Results of Purity Tests.[a]

GRASSLANDS

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RESEARCH REPORTS

GERMINATION ENHANCEMENT TRIALS PILOT PROJECT

M. Melinda Trask, Department of Rangeland Resources, Oregon State University

Introduction

Many native grass seeds exhibit a period of dormancy, which is an adaptive characteristic to promote seedling establishment under only optimal conditions. This dormancy characteristic is a common obstacle that agencies and commercial producers face when attempting to grow out native grasses. A thesis project is currently underway to assess germination and dormancy characteristics of three grass species native to southwest Oregon, *Achnapherum lemmonii* (ACLE), *Danthonia californica* (DACA), and *Festuca viridula* (FEVI). These species were selected in coordination with Wayne Rolle, Forest Botanist at Rogue River National Forest (RRNF), for use in upcoming Forest restoration projects.

This pilot project was conducted to test some germination enhancement techniques for the purpose of narrowing the range of germination options available. Successful treatments will be considered for inclusion in the germination enhancement testing phase of the thesis project. Types of treatments that were tested include various concentrations of gibberellic acid (GA3) and potassium nitrate (KNO_3), application of a commercial fungicide, and various scarification treatments. Two seed lots per species were tested per treatment. Seeds were collected from RRNF lands during the 1993 season and subjected to various storage regimes for one year, ranging from dry-frozen to dry-room temperature.

METHODS

Treatments each seed lot received during this pilot project are listed on Table 1. The control is equivalent to a standard germination test, with no treatment; the seed was placed onto a moistened substrate and set in the germinator at the settings described below. Both the GA3 and KNO_3 solutions were prepared from mixtures of distilled water with the powdered chemicals. A commercial fungicide was utilized in all fungicide treatments. The prechill treatments consisted of 5 days of dry-cold storage at 5 ℃ immediately prior to application of other treatments (when prescribed).

Two potential scarification treatments were utilized to separate out seed caryopses, including mechanical and sand paper ("sp scarify" on Table 1). Caryopses of D*anthonia* were extracted by rubbing the seeds between two pieces of medium-grained sand paper. Mechanical scarification consisted of running the seed through a rotary scarifier with large-grained sand paper. Mechanical scarification was used on ACLE except for treatment #10 in which sand paper scarification was used.

Treatments were chosen based on recommendations in the 1993 Association of Official Seed Analysts (AOSA) rules for lots of the same genera but different species, and on recommendations by scientists currently working on the species of interest. There are no published protocols for these three species. Treatments utilized on D*anthonia californica* were based on unpublished experiments conducted by Eric Knapp and Kevin Rice at the University of California, Davis. Some of the treatments performed on ACLE were based on recommendations by Craig Dremann of Redwood City Seed Company.

Twenty five seeds were used in each test, and placed in 3" x 3" plastic Petri dishes. A cotton gauze substrate was used in the D*anthonia* and *Festuca* tests and sterile sand was used in the ACLE tests, based on recommendations by Craig Dremann and the AOSA guidelines for similar genera. Seeds were taken directly from the submitted samples (obtained from RRNF) and were neither additionally cleaned nor separated for pure seed. Each treatment was tested in two locations within each of two germinators, for a total of 4 replicates per treatment per seed lot (except for the ACLEtests). One of the germinators shut down during the ACLE testing therefore only tests from the functional germinator were analyzed, resulting in 2 replicates per treatment per seed lot with the ACLE tests. The total germination percentages were based

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on the total of all replicates per treatment per seed lot. Thus, the percentages for *Festuca* and *Danthonia* tests were based on 100 total seed, and the ACLE tests were based on 50 total seeds.

The germinator settings were based on AOSA rules for similar genera. For the F*estuca* and *Danthonia* tests, the germinators were set at 16-hours of light at 25 ^{o}C and 8-hours of dark at 15 ^{o}C. For the ACLE tests, the germinators were set at the same time/temperature regimes, but were constantly dark. The AOSA rules for germinator settings and dark treatments were not strictly followed. The tests were carried out for a maximum of two months, or less time when seeds had stopped germinating.

In addition to the germination tests, each seed lot received a purity and a viability test. A tetrazolium (TZ) test was conducted by the OSU Seed Lab for the viability analysis, using 100 pure seeds. The purity test consisted of using the remaining seeds from the submitted sample after all of the other tests were performed. It was based on relative weights of pure (filled) seed, other species' seeds, and inert matter (includes empty seeds, broken seeds, stems, glume and other non-seed material). Most of the inert matter in each of the samples was empty seed. Since the samples were not cleaned, the germination treatments were not necessarily conducted on pure seed. Thus, a weighted germination was calculated for each treatment, which then accounted for the amount of pure seed, using the following formula: weighted % germination = (test % germination)/% pure seed *100.

Results and Discussion

Results of the two most successful germination treatments, viability test results, and dormancy estimates for each seed lot are summarized in Table 2. The results of the purity test are presented in Table 3 and results of the germination enhancement treatments are presented in Table 4.

The dormancy figures on Table 2 are strictly estimates of the difference between viability and germination. Seed dormancy is typically viewed as the difference between a standard germination test and a viability test. The inital percent dormancy is a measure of the dormancy in the seed lot prior to treatment, while percent dormancy after treatment is a measure of the effect of the treatment on breaking dormancy. Each of the seed lots (except perhaps DACA 1) had a high level of initial dormancy. The best *Danthonia* and *Festuca* treatments appeared to have a substantial influence on germination, with dormancy after treatment ranging from 0 to 56%. The ACLE treatments had virtually no effect on breaking dormancy; even the "best" treatments resulted in over 90% dormancy after treatment.

Of the *Danthonia* treatments, gibberellic acid was the most successful treatment in breaking dormancy and promoting germination. Since these results were slightly better than the other successful treatment (sandpaper scarification, prechill and GA_3), it appears that scarification was not as important as was the use of gibberellic acid in these tests. As shown on Table 4, when scarification alone as a treatment (# 5) is compared to the control treatment (no scarification; #1), scarification had only a marginal effect on germination.

Upon initial look at the *Festuca* purity tests (Table 3), one might speculate that the problem with germination was related to the high degree of inert matter (that was primarily empty seed). However, when the germination results were weighted to account for the purity of the seed lot, it is clear that purity is not the problem (see Tables 2 and 4). Rather, dormancy appears to be the problem with these seed lots. Overall, none of the *Festuca* tests had very high germination. However, in comparison with the other treatments, each of the *Festuca* lots responded relatively well with GA_3, with and without prechill and fungicide. In fact, percent germination with the 300 ppm GA_3 treatment on FEVI2 was slightly higher than percent viability. It essentially broke all of the seed lot's dormancy.

Note that the analysis of this pilot project was purely subjective; statistical analyses were not performed due to the nature of the experimental design. Many of these treatments will be incorporated into a more statistically sound experimental design that is part of a larger investigation into the germination and dormancy characteristics of these species.

Table 1.Germination enhancement treatments.

DACA	1	control
	2	400 ppm gibberellic acid (GA_3)
	3	prechill
	5	sp scarify + fungicide
	6	sp scarify + 400 ppm GA_3 + fungicide
	8	sp scarify+ prechill + 400ppm GA_3 + fungicide
FEVI	1	control
	2	prechill
	3	300 ppm GA_3
	4	500 ppm GA_3
	6	.2% potassium nitrate (KNO_3) + fungicide
	7	prechill + .2% KNO_3 + fungicide
	8	prechill + 300 ppm GA_3 + fungicide
ACLE	1	control
	2	300 ppm GA_3
	3	600 ppm GA_3
	4	.2% KNO_3 + buried + scarify
	5	.2% KNO_3 + fungicide
	7	mech. scarify + + 300 ppm GA_3 + fungicide
	8	mech. scarify + .2% KNO_3 + fungicide
	9	mech. scarify + fungicide
	10	sp scarify + fungicide
	11	fungicide only

[a] See methods section of text. sp scarify = sandpaper scarification treatment.

Table 2. Summary of Results

Species /Lot	Cntrl % Grm[a]	Best Two Treatments No[b]	Best Two Treatments % Grm[a]	Viab %	% Dorm Initial[c]	% Dorm After[d]
DACA 1	41.95	2	71.58	86	51.22	16.77
	41.95	8	67.37	86	51.22	21.66
DACA 2	6.15	2	56.67	91	93.24	37.73
	6.15	8	40.00	91	93.24	56.04
FEVI 1	3.68	8	21.15	33	88.85	35.91
	3.68	4	19.23	33	88.85	41.73
FEVI 2	8.49	8	21.67	34	75.03	36.26
	8.49	3	40.00	34	75.03	0.00
ACLE 1	1.09	8	4.17	80	98.64	94.79
	1.09	11	3.13	80	98.64	69.09
ACLE 2	2.09	8	7.14	96	97.82	92.56
	2.09	7	5.10	96	97.82	94.69[a]

[a] Weighted % germination =(% germ./%pure)*100.
[b] See Table 1 for a description of treatments.
[c] Estimate of initial % dormancy = ((% viable - % control weighted germination)/% viable)*100.
[d] Estimate of % dormancy after treatment (based on weighted germination).

Table 4. Treatment Results (Footnotes)

[a] Maximum days to final germination count.
[b] Based on the following formula: (%germ./%pure)*100.
[c] Treatment germination percentages of the two lots were similar, so they were averaged.

Table 3. Results of Purity Tests.[a]

Species /Lot	% Pure	% Inert[b]	% Other Seed
DACA 1	95.36	2.65	1.99
DACA 2	90.34	4.83	4.83
FEVI 1	52.19	46.30	1.51
FEVI 2	58.90	40.97	0.13
ACLE1	95.70	3.76	0.54
ACLE 2	97.68	2.28	0.04

[a] Based on relative weights of pure (filled) seed, other species' seeds, and inert matter.
[b] Inert matter is primarily empty seeds, but also includes broken seeds, stems, glume and other non-seed material.

Table 4. Treatment Results

Species /Lot	Treat. No	% Germ.	Days[a]	Weighted % Germ.[b]
DACA 1	1	38	33	40.00
	2	68	18	71.58
	3	34	28	35.79
	5	46	13	48.42
	6	44	13	46.32
	8	64	13	67.37
DACA 2	1	5	33	5.56
	2	51	40	56.67
	3	9	35	10.00
	5	25	17	27.78
	6	20	22	22.22
	8	36	13	40.00
FEVI 1	1	1	47	1.92
	2	2	44	3.85
	3	8	45	15.38
	4	10	36	19.23
	6	1	38	1.92
	7	2	28	3.85
	8	11	40	21.15
FEVI 2	1	3	42	5.00
	2	6	34	10.00
	3	24	41	40.00
	4	12	41	20.00
	6	0	45	0.00
	7	5	33	8.33
	8	13	37	21.67
ACLE 1 & 2 (average)[C]	1	1.5	38	1.54
	2	1.5	28	1.55
	3	1.5	38	1.02
	4	0	38	0.00
	5	0	38	0.00
	7	2.5	38	2.55
	8	5.5	19	5.66
	9	0.5	38	0.52
	10	0.5	38	0.51
	11	3	17	3.10

CHANGES TO *GRASSLANDS* FORMAT

Kitren Weis is now the Managing Editor and Andy Dyer is the Science Editor.

Submissions to *Grasslands* will be separated into two categories depending on content and format: research reports that are peer-reviewed (**Research Reports**), and nonreferred articles (**Observations**). The first type of article should be submitted by the author(s) with the understanding that it is appropriate for and is expected to stand up to review for scientific method, content relevance to California native grasses, and accepted format. The review process will consist of critical examination by the Science Editor, or in some cases, other professionals in relevant fields as chosen by the Science Editor. The reviewed article must present data obtained as observations collected by 'scientific methodology' with repetition. An example of an observation which is not data is a single measurement of difference in size between two plants. Observations that qualifies as data are ten size measurements each of two ecotypes and statistical analysis of the difference between the ecotypes with respect to size. However, not all scientifically collected data are quantitative. Some may be qualitative, but in all cases, data are repetitively collected. An example of qualitative data is color difference between ecotypes.

Nonreferred communications may be anecdotal accounts, interviews, reviews, observations, progress reports, ideas, opinions, suggestions. Although CNGA attempts to publish all contributed articles, relevance to the content of *Grasslands*, and the goals of CNGA is of primary importance to the selection process. Length of a contribution only becomes problematic if redundancy occurs, or if relevance is an issue. Be concise, pertinent, and clear. In all cases, editorial and referree comments are intended for article improvement or for change of format and are not intended to impune the value of the author(s) submission. Articles accepted for publication continguent on revision along suggested guidelines will be returned to the author(s) for revision and resubmission. Only in the event that a submission requires such extensive reworking by the editor(s) that rewriting is virtually required will rejection be necessary even in the case of relevant content, or comments be limited to the suggestion to rewrite along the format of articles currently appearing in *Grasslands*.

Format for referred articles must follow the outline below, or be a reasonably close approximation (so as not to discourage reprinting of articles initially published elsewhere).

Title, Names of Author(s), Introduction (stating clearly and concisely why research was conducted), **Methods and Materials, Results, Discussion or Conclusions, Pertinent Literature or Literature Cited.** Include section subheads. Plant names should follow Jepson, with common and binomial (scientific name). Keep tables to a minimum, only including data not duplicated in the text. Figures should be clearly drawn, and if possible, in camera-ready form. Figures and tables must include a legend identifying the data. All tables and figures must be cited in the text.

Submissions have been accepted in the past in virtually any form. However, in order to keep editing costs within reasonable limits, no submission will be accepted that requires retyping—ie. nothing handwritten, printed by dot matirx, or poorly photocopied. The preferred form for submission is by electronic mail to the editor (kgweis@ucdavis.edu), or on 3.5" floppy disk. Either IBM or Mac format is acceptable, and any relatively current wordprocessing program may be used.

GRASSLANDS NOTES AND OBSERVATIONS

HONORING THE ELDERS
The story of ALAN ACKERMAN BEETLE

By Craig C. Dremann, The Reveg Edge, P.O. Box 609, Redwood City, Calif. 94064 (415) 325-7333

Dr. Beetle is one of California's oldest living elders, born in Princeton, New Jersey on June 8, 1913, and even though he retired in 1978, still maintains an office at the Department of Range Management, College of Agriculture, University of Wyoming, Laramie, WY. 82071, phone (307) 766-5263.

This article was edited from materials submitted for nomination of Dr. Beetle for his Frederic G. Renner Award from the Society for Range Management in 1983 and from phone conversations.

Dr. Alan A. Beetle graduated from Dartmouth College in 1936 and during that summer accepted a scholarship to make a plant collection of the Fox Research Forest in New Hampshire. The winter of 1936-1937 was spent under the guidance of Prof. M. L. Fernald at the Gray Herbarium, Harvard University, Cambridge, Mass. Fernald suggested *Scirpus* as a research problem and this genus became the subject for a M.A. thesis at the University of Wyoming in 1938 and for a Ph.D. thesis at the University of California, Berkeley in 1941. Studies in the Cyperaceae were to result in 27 publications between 1938 and 1948.

The summer of 1937 was spent working for David Costello, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado, making inventories of Colorado plants. The winter of 1937 to 1938 was spent at the University of Wyoming under Aven Nelson. The summer of 1938 and following winter were spent in South America collecting plants for the World's Fairs in San Francisco and New York.

1939 and 1940 were spent studying at the University of California, Berkeley in the Botany Department under the direction of Lincoln Constance, W.L. Jepson,

and A.W. Sampson, which resulted in a Ph.D. in 1941.

1941 to 1946 were spent in teaching and research for the Division of Agronomy, University of California Berkeley and Davis. On the death of Dr. Mackie, Dr. Beetle was moved to Davis along with the grass herbarium started by P.B. Kennedy. These years initiated a long line of publications on grasses, 1943 to present.

I called Dr. Beetle and asked how he became interested in California native grasses.

"I got my Ph.D. from Lincoln Constance and he knew this Mrs. Wilson, and she had a part time job at Hilgard Hall. She and Constance knew each other very well and she needed help at the Herbarium, she wasn't trained to mount plants. She had an endless supply of paper sacks and had one room in Hilgard Hall full of these grasses that she had shoveled into paper sacks and I was hired to make sense out of Mrs. Wilson's collection.

"I worked for her for a year. She committed suicide, so it left a job opening at Berkeley so I went to work for the Agronomy Department making sense of what was left, and when I got my Ph.D. in '41, they offered me a job."

"When I was in Berkeley from 1941, Dr. Mackie and I were the Agronomy Department, and when he died, I was the Department. The Agronomy Department Herbarium at Berkeley was moved to Davis, and the Wilson collection was the basis for the Herbarium at Davis. I was in charge until Beecher Crampton took over. The interest in native grasses in California [in 1941] was me. I got started through a grant. I guess I'd have to say I was paid to take an interest in grasses."

Dr. Beetle's publication which is most familiar to California grassland enthusiasts is his classic Distribution of the native grasses of California published in 1947 in Hilgardia, Vol. 17, pages 309-357, where he mapped the distributions of 187 of California's 300 native grasses!

I asked Dr. Beetle how had he put together his Hilgardia article on the distribution of native grasses?

"The University of California paid for it [putting the article together], they had money to spend and very few people to spend it on in those days. I tried to prove that nothing [none of the California native grasses] had ever become extinct, and to do that I set out to collect all the grasses and I did find everything except for one or two confined to the islands. This was put together during the war and a lot of places you couldn't go, like Catalina Island, were strictly prohibited for amateurs, people."

"I put a list together first, and allowed each [grass species] to have a map. The arrangement of the maps was north to south. The maps were based on herbaria. There was a collection at Davis, and an easy day's trip was the herbarium at Cal. Academy of Sciences. I used herbarium specimens but I did collect at least once in every county in California, so a lot was based on my collections during 1941-1946. The voucher specimens are at Davis and my notebooks are here in Wyoming."

I asked Dr. Beetle what is his perspective regarding the terms "relic" and "pristine" when used to describe a grass stand?

"RELIC—anything that is natural is a relic, even one plant of Stipa [Nassella] pulchra would be a relic. Love worked with Stebbins, and we mapped Stipa [Nassella] throughout the [Central] valley; it was pretty easy to find. To Dr. Love, only a few percent was considered significant. When he found [a stand with] one tenth of one percent it was considered a significant relic!"

"PRISTINE—gophers dig up the soil so 10% or less of European weeds could be considered pristine. Any rodent that turns up the soil will make a seedbed for the European weeds, so 10% or less of European weeds would still make it pristine."

In 1946 the ever restless Dr. Beetle moved from Davis, California to Laramie, Wyoming, accompanied by a wife and two children. Beetle was later to adopt a second son. Work in range management began, including the organization of the Society for Range Management. At the University of Wyoming, he developed new courses in range plant distribution, range survey and range grasses. Before retirement in 1978, he acted as the major professor for over fifty graduate students obtaining advanced degrees, and countless others at the undergraduate level.

In 1959, Dr. Beetle undertook a study of the taxonomy and distribution of the big sagebrush (Artemisia tridentata) complex and published a classic treatment of the group which gave strength and meaning to sagebrush research which were lacking before, including the division of ***A. tridentata*** into three subspecies.

Since retirement from the University of Wyoming Range Management Faculty as Professor Emeritus in 1978, Dr. Beetle has been an advisor to the Mexican government on their natural resources, and this work has resulted in writing, editing and illustrating four volumes of the "Grasses of Mexico." Dr. Beetle's work, like Hitchcock's Manual in the United States, will serve as Mexico's standard reference on grasses for years to come.

The Beetle Herbarium at the University of Wyoming, has one of this country's best grass collections, with over 10,000 specimens. The herbarium contains a collection of grasses from Mexico second only to the Smithsonian.

RESTORATION OF THE EVAPORATION PONDS AT THE TOPOCK GAS COMPRESSOR STATION

Franklin J. Chan, Christine Smith, and Christoffer Ellis

The evaporation ponds of the Topock Gas Compressor Station were used to remove chemicals from water used in the industrial process for the operations of the facility. At the completion of the use of the evaporation ponds, the U.S. Fish & Wildlife Service required that this Mojave Desert site be rehabilitated and planted with native and other naturalized vegetation. Site restoration included removing the evaporation pond lining, removing small amounts of contaminated soil, ripping the soil to eliminate

compaction, recontouring to conform to the surrounding terrain barbartus, a naturalized species. The revegetation treatment had to address erosion and preservation of the site.

To summarize the major tasks in the restoration of the evaporation ponds, specific objectives include: (1) evaluate a seeding method that has not been used universally by the restoration industry in California
(2) evaluate native and naturalized species at a specific site and set of conditions
(3) to fulfill the regulatory requirements of re-establishing appropriate vegetation

Although no direct comparisons can be made of hydromulch seeding with imprinting, results of the imprinting was far superior to that of the 1993 hydromulch seeding. Differences are attributed mainly to rainfall differences, species used in 1994, and the imprinting technique itself. In contrast to the hydromulch seeding and irrigation, the cost of imprinting was much more favorable. Unexpectedly, mulching compared to no mulching with imprinting had a negative effect in that vegetation quantity and quality were diminished by the treatment.

In all three evaluated sites, 21 species, including seeded and non-seeded species were observed. Three of the most successful of the five species seeded were Plantago insularis, Schimus barbatus, and Atriplex polycarpus. Imprint seeding was very amenable to desert restoration. It created favorable niches for seed germination and seedling establishment. In addition, even without seeding, it is effective in controlling erosion and creating favorable conditions for natural regeneration.

President's Address

Mark Stromberg

As your new president, I want to thank Dan Stait and all the other board members for all their help in the last few months as we move into 1996. At our board meeting we discussed both the challenges and the opportunities for 1996.

First, we need to encourage more membership. Many members did not renew. Maybe this is because we did not know when membership expired. Starting in 1996, we can only afford to mail our newsletter to paid up members. But, your newsletter address label should now have the date through which you are paid up. Dues have supported much of the activities of CNGA; please ask others to join. We also discussed our plans for 1996.
Most of these activities are effective fundraisers for CNGA so I hope you can participate:

*Tom Griggs is organizing a grass identification workshop to be held again this spring or early summer. Travis Columbus (Ranch Santa Ana Botanic Garden) has once again agreed to conduct the classes and assist with the field trips. Watch for notices.

* Paul Kephart and I are organizing a CNGA field day in Monterey County for this summer. We will visit several landowners who have planted native grasses, including seed production plots, February turf test plots, irrigated and dry land pastures, restoration of buffers to TNC preserves, and look at the use of native grasses at Pebble Beach.

* The annual meeting will be held in Monterey on November 8 at the Holiday Inn. The meeting theme and speakers will be announced later.

* We are exploring a summer or fall workshop for those interested in illustrations of native grasses. We hope to work up some t-shirts, greeting cards, and an informative poster. Several students at UC Santa Cruz's Scientific Illustration group are willing to work with us.

* The Board to approved a home page on the Internet for CNGA. This will give us a presence on the World Wide Web and will feature a list of member vendors with phone numbers and contacts. We could also post announcements, information on native grasses and news on this home page.

* We will make a concerted effort to reach members of the California Nurserymen's Association and others in the landscaping business who could use native grasses.

* Frank Chan and others are making good progress on a book focusing on the horticultural and agricultural uses of native California grasses. We hope we can support this effort financially and with technical expertise of our members.

I hope you can continue your support for the California Native Grass Association in our efforts to promote, develop and restore our native grasses. I look forward to working with you in 1996.

ANNOUNCEMENTS

California Native Grass Association 1996 Annual Meeting

CALL FOR PAPERS

The California Native Grass Association will conduct its annual General Membership Meeting at the Holiday Inn Resort in Monterey on **Friday, November 8, 1996.**

The Association requests the submission of papers for presentation at this meeting. Presentations are to be approximately 25 minutes in length (20 minute talk, 10 minutes for questions) and will address one of the following two topics:

Limits to the Success of Native Grass Planting Projects (ie. Why do native grass planting projects fail?)

Weed Control in Restoring or Maintaining Native Grasses

Persons wanting to present one or more papers at the meeting should submit an abstract of 200 words or less **by May 15, 1996** to:

Annual Membership Meeting, Abstracts
California Native Grass Association
P.O. Box 566
Dixon, California 95620

The annual meeting will also feature a session entitled "Honoring the Elders" in which we will hear from, and recognize the accomplishments of, some of the pioneers in the areas of California native grass research, taxonomy, and ecology.

Further details on the meeting and registration information will appear in the June issue of *Grasslands.*

Grad student seeks grazed grasslands for inclusion in thesis project analyzing native grass distribution in the Santa Cruz Mtns. Rare or threatened plant species not included in the project. Please call Cort Johnson at 408 973-0304 or email at gr520199@sjsuvml.sjsu.edu

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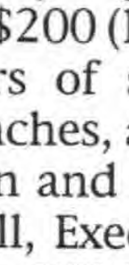
Elkhorn Native Plant Nursery invites YOU

Our open house/spring plant sale will be Saturday May 4th from 10-3. Light refreshments will be served. The open house is for people to accquaint or reaccquaint themselves with the nursery and our operation. There will be guided tours through the nursery and trail walks down to the slough. We will have sale prices for the plants. There is no charge for the event.

Contact: Jodie Sandoval
Elkhorn Native Plant Nursery
1957 B Salinas Rd (Hwy 1)
Watsonville, CA 95076
(408) 763-1207 (office)
(408) 728-0795 (home)

Located off of Highway 1 in Moss Landing, across the highway from the Beacon and Army Surplus stores.

CONFERENCE ON THE ECOLOGY, CONSERVATION AND MANAGEMENTOF VERNAL POOL ECOSYSTEMS



June 19-21, 1996
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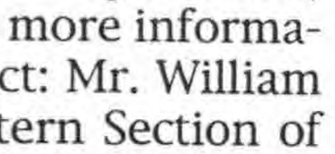
Sacramento, California



Four sessions include:

Vernal Pool Distribution and Characteristics
Ecology, Systematics, Status and Trends of Vernal Pool Plants, Animals, and Ecosystems
Conservation and Management of Vernal Pools
Vernal Pool Regulatory, Planning, and Policy Issues

The 40+ invited speakers and panelists include scientists, managers, and planners from universities, state and federal agencies, local governments, environmental consulting firms, and conservation organizations. Registration fees range from $100 (early registration by student members of sponsors) to $200 (late registration by non-students, non-members of sponsors), and fees include registration, lunches, and refreshment breaks. For more information and registration materials contact: Mr. William Hull, Executive Secretary of the Western Section of The Wildlife Society, P.O. Box 21638, Oakland, CA 94620-1638, or call (510) 465-4962.

California Native Plant Society
Society for Ecological Restoration, California Chapter
Western Section of The Wildlife Society

The McConnell Foundation invites CNGA members to view its restoration site in Spring, 1996. Contact Peggy Fain, Landscape Maintenance Mgr., 292 Hemsted Dr., Ste 100, Redding CA 96099-1870; (916) 222-0696 or (916) 222-0695 (fax).

Valley Transplant Company

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* Inexpensive plugs—cell size 1 1/4" x 1 1/4" x 3"
* Price dependent on quantity and grass species
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* Fall propagation for mid winter/early spring planting
* Custom seed collecting services available

Price per species/accession

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