

1992 CNGA Research and Development Program Final Report

By

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R&D Committee Goals

The stated R&D Committee Goal is: **To Promote the Development of Technology to Restore and/or Rehabilitate Ecosystems Using Native Grasses and Associated Species**

To accomplish these goals the 1991/92 R&D Committee initially developed three main objectives:

- **Collect** seed and plant material,
- **Evaluate** the material in common gardens and regional field trial settings, and
- **Demonstrate** plantings and seeding performances.
- **Record** information in a comprehensive statewide native grassland database.

The fourth objective and perhaps the most important objective of the R&D Committee has been discussed widely at meetings. The database will be generated by empirical information gathered in field trials and from questionnaires distributed to the CNGA membership, universities and colleges, public agencies, and non-profit resource organizations. Ultimately the CNGA Grassland Database will provide the information for the Education Committee to serve the needs of the membership in obtaining California native grassland related information.

Grass Garden Projects

The 1991/92 Grass Garden Project has been summarized in the February and May 1992 issues of Grasslands and in memos to the Executive/R&D Committee members. Over 6000 plants were grown of 22 species collected in the wild throughout the state or received from native seed growers. The grasses were plated at five demonstration gardens from central to southern California. The Flores garden (S&S Seeds) was the first garden planted prior to three weeks of rain and thus developed into the best established garden. Planting of some of the demonstration gardens (Hedgerow Farms, Rancho Santa Ana, Elkhorn) was delayed until the end of February and early March. The Holland Tract garden (ConservaSeed) was the last garden planted on April 1. Because of the late planting date, data has not yet been taken from the Holland Tract garden. Unfortunately, the Tree of Life garden did not get planted due to almost continuous rains in the southland. The primary criteria for plant measurement include: seedling emergence data, germination ratings, rate of seedling growth, mortality, peak cover, peak height, flowering and seeding time, peak flowering culm numbers, second year regrowth, disease (mildew, rust, insects), and physical plant descriptions (color, hairs, glumes, lemmas, etc.). In the future, seed production, seed analysis, mineral content, and electrophoresis information could be collected by investigators. Phenology and growth characteristics are presented in the Appendix for *Bromus carinatus* and *Elymus glaucus*.

The 1992-93 program is utilizing the funds received from David Packard to grow plants for replicated experiments in the *Bromus carinatus* complex and the meadow barley (*Hordeum brachyantherum/californicum*) group for the 1992-93 season. Twenty-four accessions of bromes (200 plants each) were grown including *B. arizonica* (Cucamonga), *B. marginatus* (Bromar), and exotic bromes in the same and related complexes (Deborah brome, *B. stamineus*, *B. willdenovii*,

and *B. catharticus*). In the literature there is descriptive and genetic information on this complex that serves as a good basis for this experiment (Stebbins and Tobgy 1944, Stebbins, Tobgy, Harlan 1944, Harlan 1945, Stebbins 1945). Seven accessions of the meadow barley group were collected and grown including a collection of *H. californicum* from the type locality at Hastings Reservation in Monterey County. One hundred plants each were delivered to Elkhorn Ranch (November 10) and the SCS Lockeford Plant Material Center (November 12). The Elkhorn garden was planted in five replicated blocks on November 18. Each block contains smaller blocks of 20 plants each per accession randomly located. The SCS garden under the direction of David Dyer will be planted soon in 4 replicated blocks (20-25 plant row for each accession). A list of all the accessions collected for this program is presented in the Appendix.

Information Packet

One thousand dollars was allocated for compiling CNGA information packets. Information and drafts were sent to the R&D Committee earlier this year for comment. Most of this information has been published in *Grasslands* in some form or another. This information including comments has been turned over to the new Education Chairperson, Kitren Weis, for final compilation and presentation. No monies in this budget were spent and thus have been transferred to Kitren Weis.

Adaptability Table

Two hundred and fifty dollars was set aside for the development of a native grass adaptability table. Under the guidance of Dave Dyer, SCS Plant Material Center Director, the early Technical Committee drafted a native grass adaptability rating table for 10 common native perennial grasses. It was the hope of the Committee that this table will act as a rough guide for future information gathering and database construction. The table characterizes native grasses in terms of regional climate, ecotype suitability, and plant characteristics. In effect the adaptability table is a short/table form description of each grass. It has been very difficult to improve or change this original document since in many cases we do not have enough information. Adaptability **and** zonation are closely related and may be the same issue. No monies in this budget have been spent.

Literature Review

An important objective of the Technical Committee is to conduct a thorough background check and literature review of previous work with native grasses in California. Work conducted by the Soil Conservation Service (SCS) is recorded in detailed technical reports dating back to 1944. The CNGA Board has approved monies to review this material and has hired Cini Brown to accomplish this task. Ted Adams is the sub-committee chairman of this project.

Grassland Database

Dialogue concerning the CNGA grassland database has been on-going. Seven hundred dollars has been set aside to explore/purchase database soft ware, etc. The consensus of opinion indicates that a relational-base database (Paradox etc.) would best serve CNGA's purposes. In the Appendix is a list of database categories/questions that need to be addressed in a CNGA grassland database, and a rough draft questionnaire that may serve as a building block for the CNGA grassland database. The SCS Major Land Resource Areas (MLRA) is an excellent basis for native grass zonation and adaptability. Overlaying county boundaries and a particular

MLRA focuses on a reasonably sized polygon for data-base entry. Elevational factors, especially in the Sierra Nevada Range (area 22) need to be identified. *Stipa pulchra* exists in MLRA 4, 14, 15, 16, 18, 19, and 20. Plants in the *Bromus carinatus* complex exist in all sixteen areas. State seed regions and/or zones can be gradually identified based on collections from the MLRA/County/Elevation collection sites.

Budget

Presented below is the up-to-date CNGA Research and Development budget reflecting the latest invoice submitted to the treasurer 11/20/92. The first three columns represent the 1991-92 budget and the fourth column represents the initial 1992-93 budget that began with the \$3000 donation from David Packard. The last invoice includes labor spent on caring for the plants, summarizing data, and writing this final report. \$1950 remains in the budget and reflects funds not spent on the information packet, adaptability table and native grassland database. \$1000 should be transferred from this budget to the Education Committee budget for the information packet development.

**CNGA Budget
1991-92 and 1992-93**

	1/2 1992 Budget	7/3 1991-92 Spent	10/5 1991-92 Remaining	11/20 1992-93
Information Packet	\$ 1000	\$ 0	\$ 1000	\$ 0
Adaptability table	250	0	250	0
Native grassland database	700	0	700	0
Materials and greenhouse rent/labor	4000	4000	0	0
Technical manager (Labor)	4000	4000	0	0
Budgeted Totals	<u>\$ 9950</u>	<u>\$ 8000</u>	<u>\$ 1950</u>	<u>\$ 3000</u>
Total Remaining Funds			<u>\$ 1950</u>	<u>\$ 3000</u>

Estimate Grass Garden Budget for 1992-93

The 1992-93 grass garden program is greatly reduced from the \$8000 originally budgeted for the 1991-92 program. Thus far only \$3000 has been allocated which consists of the monies received from David Packard. Planting and plot maintenance are the responsibility of the cooperative grower/agency. Monitoring the plots is the responsibility of the CNGA R&D Committee technical manager. The brome/meadow barley program experiment will minimally require six visits (person/days) to each site per year to collect the necessary empirical

information to adequately describe the plants and their differing phenologies. It is estimated that six trips to each of the locations (SCS, Elkhorn) will cost \$375 (\$ 750 total). Labor for 12 days at \$25/hr would total \$2400. Therefore, it is estimated that these sites can be monitored for \$3150. This does not include data treatment or a report, which should add another \$2500 to the cost of the program. The total cost for monitoring and reporting is \$5650. The Board may choose to let SCS use its own criteria and methods for monitoring. This will save half the monitoring/reporting cost (\$2825).

The main CNGA Cooperative Gardens other than the SCS and Elkhorn Ranch are: Flores, Winters, and Holland. These sites should each be monitored at least three times per year. Estimated cost for travel and three days labor for each of the sites are as follows: Flores \$1050, Winters \$720, and Holland \$720--Total \$2490. The Board may choose not to monitor Flores, Winters, and Holland or monitor these sites, for example, only once a year. This may also be an opportunity to develop a standardized monitoring program/form that could be used by the Cooperator and which can serve as a basis for data entry into the main CNGA Grasslands Database.

Agreement with Cooperative Grass Garden Members

CNGA has an official agreement with the Soil Conservation Service that covers research and development goals shared by both organizations. At the first 1992 R&D Committee meeting members and attending cooperators agreed in principle to four points that should be included in a cooperative agreement:

- Ground is donated to CNGA or rented by CNGA for a period of time (3-5 years).
- All plants and seed produced belong to CNGA.
- Plots are weeded and maintained by the cooperator. Funds spent by the cooperator in labor and materials on the CNGA plots can be a tax-deductible donation to CNGA.
- Seed will be harvested and distributed at the discretion of CNGA. Seed will not be distributed to seed growers for increase or sale. Seed will be used by CNGA only for research and demonstration purposes.

The time has come for these agreements to be formalized and signed. The agreements should also specify the actual size of space (1/4 acre, 1 acre, etc.) to be donated and maintained. In this way, CNGA can better plan for crop changes, plant additions, fallow ground, etc. The CNGA plots do not necessarily need to be contiguous. Some allowance for visits by the public/CNGA membership also needs to be formalized with the cooperators. A site record sheet may need to be maintained by the cooperator to record irrigation dates and duration, fertilizer applications, herbicide/pesticide/fungicide applications, rain, temperature, etc.

Physical and Cultural Observations

Because of the continuous rains, most of the gardens were established too late in the season (February - March) for one to make definitive statements on physical and cultural attributes of the plants. Much of the mortality of the higher elevational bromes and all of the *Stipa* mortality can be attributed to the plants being held too long in humid greenhouse conditions before planting. In all of the gardens, the second year spring observations (1993) will be very important since the plants will have had a full season to establish and grow. At this time certain statements can be made describing plant vigor, physical characteristics, etc. Following are observations of the different species:

- *Agropyron spicatum*: Plants grew slower than *Elymus* species and may be longer-lived plants.
- Cucamonga brome: Cucamonga brome is definitely an annual and is most likely *Bromus arizonicus*. Cucamonga root growth is much weaker than California brome root growth.
- *Bromus carinatus*: California bromes are variable throughout the state in a north-south transect and in elevational clines (see selected data summaries). California brome is a short-lived plant. A higher elevational brome species (*B. spp.*) thought to be *B. carinatus* did not survive any of the plantings and may be another taxon.
- *Bromus marginatus*: There are no positive attributes that can distinguish Mountain brome from California brome. Hairiness, culm branching, glumes, etc. are all physically similar.
- Bromar: Bromar is very closely related to Deborah brome in physical appearance and phenology. The leaf sheath is not hairy and the plants do not fit any of the descriptions for *B. marginatus*. Bromar has a very weak root system (similar to Cucamonga) compared to the California bromes.
- Deborah brome: There are major differences between Deborah brome and California brome in terms of phenology, root growth, season of growth, etc. (see selected data summaries).
- *Danthonia californica*: California oatgrass did well in only one site (Winters) and may be due to the fact that it is susceptible to certain herbicides (2,4-D?) or pre-emergents.
- *Deschampsia caespitosa*: It is too early to evaluate these plants, however, differences were observed.
- *D. elongata*: This is a short-lived species (annual to biennial) and tends to die after flowering. However, flowering plants that are not irrigated too heavily will possibly live one more year.
- *Elymus glaucus*: Blue wildrye is variable throughout its range, especially in an elevational cline (see selected data summaries). Plants were susceptible to rust.
- *Elymus trachycaulus*: The slender wheatgrass originating from 4000' did not do well at the lower elevational gardens. This collection is very different from the variety *majus* collected by J. Anderson in Yolo County.
- *Festuca idahoensis*: It is too early to make any definite observations between the varieties tested.

- *F. rubra*: The Jug Handle variety is slower growing and low to the ground. Red fescue appears to be an out-crosser. No viable seed was collected from the few flowering culms.
- *Hordeum brachyantherum*: The meadow barley collections all appeared uniform in appearance. However, the high elevational accession flowered later and over a longer period of time than the other lower elevational accessions.
- *Melica californica*: Too few accessions were tested to make any definite statements concerning regional differences. This species needs a more complete investigation.
- *M. imperfecta*: There is definitely a coastal variety and an inland variety. The coastal variety extends from Marin County south along the coastal mountains to Monterey County. Differences in the field were observed between coastal and inland San Diego County. The coastal variety has a much larger and denser flowering culm with greatly reflexed panicle branches, whereas the inland form has a shorter and smaller panicle. *M. torreyana* also needs to be studied as it is closely related to *M. imperfecta* and may in fact intergrade in Marin and Napa Counties.
- *Sitanion jubatum*: Squirreltail is quite variable throughout its range. The Trinity County variety is less hairy than the other varieties. The difference between *S. jubatum* and *S. hystrix* may be due to site conditions (soil, moisture, etc.) and thus both may be the same taxon. This species needs a more complete investigation.
- *Stipa cernua*: Nodding needlegrass seems to suffer in soils with higher clay content. It is too early to make any definite observations between the accessions collected.
- *S. comata*: The accession of needle-and-thread grass did well both in containers and in the various gardens. It did not flower the first season.
- *S. lepida*: Foothill needlegrass seems to suffer in soils with higher clay content. However, there is a coastal variety that does well in clay soil and is a more robust plant than the inland and southern California forms.
- *S. pulchra*: Purple needlegrass preferred the clay soils. It is too early to make any definite observations between the accessions collected.
- *Trisetum canescens*: The spike trisetum accession did well in cultivation and produced many more flowering culms than observed in the field. This species may be a short-lived plant similar to blue wildrye.

Appendix

The following are Categories for a Relational Based Data Base.

Registration Number

Species

Common Name
Registration Number
Region
Project Type
Description
Citation

Region (16 Regions: SCS MLRA)

County
Soil Type
Elevation
Rainfall
Temperatures

Project Type (one or more of the following: Agronomy, Ornamental, Erosion control, Hedgerows, Restoration, Rehabilitation, Seeding after fire, Roadside, Exclosure, Grazing, Rest, Preservation, Habitat enhancement)

Project Description (Abstract)

Contact person/Agency

Location

Species

Site preparation: Burning, Herbicide, Cultivation, Mowing, Grazing,

Establishment Technique: Seeding rate, Drill, Broadcast, Plugs, Grazing, Planting Date, Rainfall, Irrigation, Fertilizer

Maintenance Technique: Grazing, Mowing, Herbicide, Weeding, Burning

Project Evaluation (Abstract)

Plant Description (Species)

Registration Number

Region

County

Exact location (source)

Associated species
Seed size
Awn length
Seedling vigor
Growth habit (spread, height)
Flowering date
Seed maturity date

Plant Adaptability (**Species**)

Citation

Water requirement (drought tolerance)

Light requirement (shade tolerance)

Nutrient requirement

Soil requirement (serpentine, salinity, pH, clay, parent material, etc.)

Longevity (annual, biennial, short lived perennial, long lived perennial)

Dormancy (facultative, obligate, winter, summer)

Disease resistance

Herbicide sensitivity

**California Native Grass Association
Restoration Site and Field Trial Inventory (Draft)**

Persons/Agencies Responsible (address & phone #):

Short Description of Project:

Location and Size of Project (county, town, road, address):

Site Information (soil type, elevation, slope, exposure):

Rainfall (average & actual):

Condition of Site Prior to Planting:

Species Planted:

Date of Planting:

Planting Techniques (seed bed preparation, burning, herbicide use, drill, broadcast, ring roll, fertilizers, plugs, etc.):

Follow-up Management Procedures (grazing, mowing, herbicide, weeding, burning, etc.):

Establishment Success (seedling density, % cover; first year & second year):

Reasons for Success/Failure:

Brome % Cover, Height
 Rancho de las Flores, Santa Barbara CO
 Planted February 5, 1992
 (North to South, Coast Range & Shasta/Sierra Mts.),
 David Amme and Susan Camel

May 29, 1992

Location, elev.	% COVER	HEIGHT (cm)
Sonoma Co. Mts., 800'	40	89
Cucamonga Brome, 800'	15	80
Mt. Tamalpais, 1000'	25	100
Berkeley Hills, 1700'	75	93
Santa Monica Mts., 2000'	70	134
Hastings Reserve, 2400'	20	124

Lake Shasta, 1600'	20	127
Mid-Sierra, 3000'	10	109
Marble Mts., 4500'	75	106
Mid-Sierra, 4500'	20	101
Mid-Sierra, 7000'	20	78

San Mateo Coast, 30' (<i>B. maritimus</i>)	75	72
Deborah Brome	95	64

Brome Seeding Phenology

Rancho de las Flores, Santa Barbara CO

Planted February 5, 1992

(North to South, Coast Range & Shasta/Sierra Mts.),

David Amme and Susan Camel

Location, elev.	Month							
	1	MAY			1	JUNE		30
		15		30	1	15	30	
Cucamonga Brome, 800'		X X	XXXX	X X				
Sonoma Co. Mts., 800'			X X	XXXX	X X			
Mt. Tamalpais, 1000'			X X	XXXX	X X			
Berkeley Hills, 1700'				X X	XXXX	X X		
Santa Monica Mts., 2000'			X X	XXXX	X X			
Hastings Reserve, 2400'			X X	XXXX	X X			

Lake Shasta, 1600'					X X	XXXX	X X	
Mid-Sierra, 3000'				X X	XXXX	X X		
Mid-Sierra, 4500'					X X	XXXX	X X	
Marble Mts., 4500'					X X	XXXX	X X	
Mid-Sierra, 7000'						X XXX	X	

San Mateo Coast, 30' (<i>B. maritimus</i>)					X X	XXXX	X X	
Deborah Brome							X X	

Blue Wildrye % Cover, Height

Rancho de las Flores, Santa Barbara CO

Planted February 5, 1992,

David Amme and Susan Camel

May 29, 1992

<u>Location, elev.</u>	<u>% COVER</u>	<u>HEIGHT (cm)</u>
Yolo Bypass, 20'	35	118
San Simeon, 30'	10	48
Winters, 200'	40	107
Work Ranch, 1500'	10	106
Hastings Reservation, 2000'	20	98
Mid-Sierra, 4500'	30	91
Mariposa, SCS	40	119
Mid-Sierra, 7000'	10	(no flowering culms)

Blue Wildrye Seeding Phenology

Rancho de las Flores, Santa Barbara CO

Planted February 5, 1992,

David Amme and Susan Camel

		Month												
		MAY				JUNE				JULY				
Location, elev.	1	15	30	1	15	30	1	15	30	1	15	30	1	
Yolo Bypass, 20'					X	X	XXXX	X	X					
San Simeon, 30'										X	X	XXXX	X	X
Winters, 200'					X	X	XXXX	X	X					
Work Ranch, 1500'				X	X	XXXX	X	X						
Hastings Reservation, 2000'					X	X	XXXX	X	X					
Mid-Sierra, 4500'					X	X	XXXX	X	X					
Mariposa, SCS								X	X	XXXX	X	X		
Mid-Sierra, 7000'													(no flowering culms)	

1992-93 CNGA Grass Production

Delivered to Lockeford PMC, November 12, 1992

Species	Location	Elevation	Source	#'s
<i>Bromus carinatus</i>	Siskiyou Summit Siskiyou CO	5000'	D. Amme	100
<i>B. carinatus</i>	Sunrise Highway San Diego CO	5000'	D. Amme	100
<i>B. carinatus</i>	Portola Road Sierra CO	5000'	D. Amme	99
<i>B. carinatus</i>	Fairfax Bolinas Rd. Marin CO	1200'	D. Amme	100
<i>B. carinatus</i>	Crater Lake Ntl Park Klamath CO, Oregon	6000'	SCS	99
<i>B. carinatus</i>	Eldorado Ntl Forest Eldorado CO	4000'	S. Stewart	99
<i>B. carinatus</i>	Omo Ranch Road Amador CO	3000'	D. Amme	100
<i>B. carinatus</i>	Mt. Vollmer, Alameda CO	2000'	D. Amme	98
<i>B. carinatus</i>	McCloud Siskiyou CO	3200'	D. Amme	100
<i>B. carinatus</i>	Santa Monica Mts. Los Angeles CO	1600'	D. Amme	98
<i>B. carinatus</i>	Cone Peak Monterey CO	4500'	D. Amme	100
<i>B. carinatus</i>	Gazelle Rd. Siskiyou CO	4000'	D. Amme	100
<i>B. carinatus</i>	Hastings Monterey CO	2400'	D. Amme	100
<i>B. carinatus</i>	Shasta Lake Shasta CO	1600'	D. Amme	100
<i>B. carinatus</i>	Mt. Tamalpais Marin CO	1600'	D. Amme	100
<i>B. carinatus</i>	Green Valley Rd. Sonoma CO	800'	D. Amme	100
<i>B. arizonica</i>	Cucamonga Riverside CO	200'	D. Amme	100
<i>B. maritimus</i>	San Mateo Coast San Mateo CO	100'	P. Kephart	95

Species	Location	Elevation	Source	#s
<i>B. marginatus</i>	"Bromar"	Unkwn	Pacific Coast Seeds	100
<i>B. spp.</i>	"Deborah"	Unkwn	Pacific Coast Seeds	100
<i>B. stamineus</i>	"Gala" S. America	Unkwn	Cascade Seed New Zealand	100
<i>B. stamineus</i>	Berkeley S. America	100'	D. Amme	100
<i>B. willdenovii</i>	"Matua" S. America	Unkwn	Oldfields Seeds New Zealand	100
<i>B. catharticus</i>	Berkeley	Unkwn	D. Amme	72
<i>Hordeum brachyantherum</i>	Mokelumne River	40'	R. Reiner	100
<i>H. brachyantherum</i>	Highway 89 Sierra CO	5000'	D. Amme	100
<i>H. brachyantherum</i>	Yuba Pass Placer CO	7000'	E. Butts	93
<i>H. brachyantherum</i>	Yolo Bypass Yolo CO	40'	J. Anderson	100
<i>H. californicus</i>	Cache Creek Yolo CO	500'	J. Anderson	100
<i>H. californicum</i>	Hastings Monterey CO	1800'	D. Amme	99
<i>H. californicum</i>	Mt. Burdell Marin CO	800'	D. Amme	99
			Total	3051

SOURCES FOR NATIVE GRASS SEED AND PLANT MATERIAL

Agrono-Tec
21420 Bundy Canyon Rd.
Lake Elsinore, CA 92330
714-674-0638

Retail Seed Sales
Seeding Service

Albright Seed Co.
Camarillo, Ontario, Vista,
Sacramento, Martinez
800-423-8112

Retail Seed Sales

Clyde Robin Seed Co. Inc.
3670 Enterprise Ave.
Hayward, CA 94545
510-785-0425

Retail Seed Sales
Seeding Service

California Flora Nursery
P.O. Box 3
Fulton, CA 95439
707-528-8813

Container Plants
Contract Growing

CCC Nursery
P.O. Box 7199
Napa, CA 94558
707-253-7783

Container Plants
Contract Liner Production
Seed Collection

ConservaSeed Inc.
P.O. Box 455
Rio Vista, CA 94571
916-775-1676

Grower
Wholesale Seed Sales
Contract Seed Growing

Cornflower Farms
P.O. Box 896
Elk Grove, CA 95759
916-689-1015

Container Plants
Contract Liner Production

Circuit Rider Productions
9619 Old Redwood Highway
Windsor, CA 95492
707-838-6641

Container Plants
Contract Liner Production
Seed Collection

Elkhorn Ranch
P.O. Box 70
Moss Landing, CA 95039
408-722-1676

Grower
Wholesale Seed Sales
Contract Seed Growing
Contract Liner Production

Four Seasons Seed
1504 Beverly Place
Albany, CA 94706
510-526-9257

Research Grower/Seed Increase
Retail Seed Sales
Contract Seed Growing
Contract Liner Production

Greenlee Nursery
301 E. Franklin Ave.
Pomona, CA 91766
714-629-9045

Container Plants
Contract Liner Production
Rhizomes

Larner Seeds
P.O. Box 407
Bolinas, CA 94924
415-868-9407

Retail seed sales
Seed Collection

Mostly Natives Nursery
27215 Highway 1, Box 258
Tomales, CA 94971
707-878-2009

Container Plants
Contract Growing

Native Sons
379 West El Campo Road
Arroyo Grande, CA 93420
805-481-5996

Container Plants
Contract Growing

Pacific Coast Seed, Inc.
7074 D Commerce Circle
Pleasanton, CA 94566
510-463-1188

Retail Seed Sales
Seeding Service

Pacific Open-Space, Inc.
P.O. Box 744
Petaluma, CA 94953
707-769-1213

Grower
Wholesale Seed Sales
Contract Seed Growing
Seed Collecting

Ramsey Seed, Inc.
P.O. Box 352
Manteca, CA 95336
800-325-4621

Retail Seed Sales

Redwood Seed Co.
P.O. Box 361
Redwood City, CA 94064
415-321-8333

Retail Seed Sales
Contract Liner Production/Bare Root
Seed Collection

SIS Seeds
P.O. Box 1275
Carpinteria, CA 93013
800-684-0436

Retail Seed Sales
Seeding Service

Sunset Coast Nursery
P.O. Box 221
Watsonville, CA 95077
408-726-1672

Container Plants
Western Dunegrass Rhizomes
Contract Liner Production

Theodore Payne Foundation
10459 Tuxford Street
Sun Valley, CA 91352
213-768-1802

Retail Seed Sales
Container Plants

Tree of Life
P.O. Box 736
San Juan Capistrano, CA 92693
714-728-0685

Retail Seed Sales
Container Plants
Contract Growing

Wapumne Native Plant Nursery
3807 Mt. Pleasant Road
Lincoln, CA 95648
916-645-9737

Container Plants
Contract Liner Production
Seed Collecting

Wildwood Nursery
P.O. Box 1314
Claremont, CA 91711
714-621-6675

Retail Seed Sales
Container Plants
Contract Growing

Yerba Buena Nursery
19500 Skyline Blvd.
Woodside, CA 94062
415-851-1668

Container Plants