GRASSLANDS

The Newsletter of the California Native Grass Association Volume 4, No. 1 March 1994

Native Pasture Establishment- Carmel Valley

Mark Stromberg, Ph.D., Manager, UC-Berkeley, Hastings Natural History Reservation

Time Curran, Manager, Oak Ridge Ranch, Carmel Valley

In 1991 management of the Oak Ridge Ranch in Carmel Valley joined with the efforts of Dave Amme and Paul Kephart in trials of native grasses on ongoing ranching operations. Funding from the Carmel Ranch Company initiated this and several other Carmel Valley projects with native grasses, all associated with the Hastings Reserve. Oak Ridge volunteered a 5.5 ac area on the south side of Carmel Valley Road which had a comparable pasture to the north of the road. This site is at about 1,800 feet in elevation, 24.1 miles inland from Highway One in Monterey County. Soils of the site bisected by the county road are very sandy, as the area is an almost level alluvial fan forming a terrace where it reaches the next larger drainage. We report here on a successful conversion of this area to a perennial grassland pasture. The area north of the county road continues to serve as a comparison site, and continues to be dominated by European annual species.

In order to manage for the benefits of native, perennial grasses in a cattle operation, seeds had to be brought to the site. Many fine relict stands of Nasella pulchra occur near this site, but on steep clay hillsides. Relicts of Elymus triticoides occur nearby, but only on areas which have not been cultivated. Historically, we believe this study site had been in hay or barley production for many years early in the 1900's. It was dominated by Erodium cicutarium. Erodium botrys, Bromus diandrus and Avena fatua. Gophers and ground squirrels are abundant on the site.

In December of 1991, the site was disced and cross disced. Seeds of Elymus glaucus, Bromus carinatus and Hordeum brachyantherum (ConservaSeed stock) were broadcast at from 80-120#/ac into the tilled soil. Seed sources for these grasses and Hordeum b. californicum. now available from native populations in Carmel Valley, were just being introduced to growers. Roger Allan used a ring roller (10" diameter) to compact the seeds into the soil. Germination and the highest density of seedlings were observed in impressions left by the tractor tires. Germination was delayed until late January when many other annuals germinated as well. A small area (1 ac.) within the larger S ac. sites was additionally drilled (Truax) with Nasella pulchra (2#/ac.) as well as more Elymus glaucus and Bromus carinatus (4#/ac.) in January, 1992. On March 19, 1992, the field was sprayed with 2,4-D as per label instructions to slow the broadleaf plants, mostly Erodium. Both Bromus and Avena grew rapidly and were mowed to 6", at the milk stage of seed formation on April 21, 1992. Clippings were raked to the edge of the field to open the ground level to light. We mowed to eliminate that year's production of annual (exotic) grass seed.

Some light grazing (5-10 animals/2 weeks) was done in the late summer after seed-set. On November 25, with help from the Carmel Hill CDF crews, the area was burned. This was done to clear the litter and to kill many of the germinating broadleaf plants. The burn was very cool and about 80% of the area burned. November of 1992 was relatively dry and there was relatively little germination of the annuals in the soil seed bank. Growth of the grasses and most of the annuals did not resume until late January of 1993.

In early March of 1993, Roger again applied 2,4-D at label rates and in April, the field was mowed when the annual grasses were at the milk stage in seed formation. By this time, Bromus had decreased dramatically in dominance and most of exotic grass mowed was Avena fatua. Nasella pulchra did not thrive, much as we expected as it is more common in soils with some clay. The additional drilling of seed does not appear to have produced any noticeable increase in native grass density. During the summer of 1993, Elymus glaucus and Hordeum brachyantherum were widespread and well established. The latter flowered first and shed seed while seeds of Elymus persisted on the culms into December. The field was trampled by 200 head of cattle for one day in November. On December 9, once more with help from CDF, we attempted to burn the pasture. Fall of 1993 was the first fall in many years with a dramatic green-up of the pastures in upper Carmel Valley. Abundant annual grass continued to germinate (probably Avena and Vulpia). Due to wet conditions, the controlled burn failed to burn more than about 5% of the area.

Density of Bromus carinatus and Elymus glaucus varied in December 1993 from 2-4 clumps/square foot. These plants are well established, with a typical diameter of 4-5 inches. We will be watching closely for establishment of new seedlings of native grasses in 1994. Erodium has been reduced to very low density. Mustards (Brassica spp.) are present but at very much reduced cover, both compared to the control plot north of the county road. Mullen (Eremocarpus setigerus) continues to be a dominant broadleaf plant on both sites, but grows late in the season, well after the perennials have become relatively dormant. Both native grass species had green forage at the base of each plant year-round. Grazing continued on a sporadic, year-round basis with up to 20 cows present for periods of

In This Issue:

2-5 days. This pasture was largely held out of a short-duration, high intensity grazing system for one year while the seedling plants established. In 1994, it will be included in Oak Ridge Ranch's cycle of grazed pastures, with intensive cropping planned for April 1994 and again in late summer after seeds are produced. If enough cattle are not available in April, the plot will be mowed to reduce the seed crop of annual grasses. Continued management for perennial grasses will include cool burns (Nov.- Jan.) when annuals are germinating and intensive grazing by livestock during late spring before annuals grasses (Avena, Bromus) have mature seeds. Ongoing studies at the adjacent Hastings Natural History Reservation, University of California, Berkeley, will include this site on Oak Ridge Ranch in long-term, quantitative monitoring of native perennial grasses.

Encouraged by the growth of these native grasses in the 5.5 ac. pasture, a seed production plot was established. About one quarter acre, gently sloping to the east and with clay soils, was planted on January 28, 1993 with 15-20#/ac of Bromus carinatus. Elymus glaucus and Hordeum brachyantherum (S&S Seed). A Truax drill was used, but hardly broke the hard, clay surface. Annual grasses and forbs were germinating at this time, and the area was sprayed with RoundUp® at the label rates. The area was fenced, and immediately after planting, 20 head of cattle were moved onto the plot and chased around on horseback for an hour. Then, a tractor was driven in circles on the plot to further compact the seed into the soil. Germination was rapid and excellent. Dense rows of plants, 6-8" on center, and virtually continuous along the rows, grew and thrived. One application of 2,4-D was made in March, 1993. Weeding for mustard (Brassica spp.) was done once by hand in May. A virtually pure stand of these grasses now dominates the site. Management plans continue to include use of broadleaf herbicides and mowing. Propagation of these seed will be done by hand-scything mature plants with seed, storing the harvested plants, and scattering this native hay and seed on winter feed sites where alfalfa hay is fed. By shifting winter feed sites, we hope to use minimal technology to establish these grasses. Native collections of Hordeum b. californicum. Elymus multisetus (Big Squirrel-tail), and Elymus triticoides (Creeping wild rye) are being grown on irrigated pastures on adjacent Rana Creek Ranch and will be included in similar future trials. A major effort is underway at Rana Creek Ranch conducting trials of many local native and coastal grasses for use in permanent pasture. But that is another story.

Articles published in *Grasslands* do not reflect the views of CNGA, its officers, Board Members, or staff, but rather those of author(s). CNGA is dedicated to the unbaised publication of newsworthy information for the benefit of its readers and will present opposing viewpoints whenever submitted.No article will be rejected on the basis of its content unless defamatory or otherwise personally offensive material is included.

--The Editor

PRESIDENT'S MESSAGE

Ted Adams

This message is my last as president of CNGA, and I want to highlight some of our achievements and our plans for 1994.

Membership has grown. Although some folks failed to renew in 1993, current membership is nearly 500 including renewals for 1994 and new members. This strength is making possible the delivery of information you want and need.

In the last two years, two successful spring technical conferences have been conducted: the first at Elkhorn Ranch near Moss Landing in Monterey County and the second in 1993 at ConservaSeed in the Sacramento-San Joaquin Delta near Courtland. These conferences were attended by a total of nearly 300 enthusiastic membe

In each of the last two years, grass identification workshops have been conducted. The 1992 event was held in Arcadia, and Quincy in northern California was the site of the 1993 workshop. CNGA members strongly support these workshops, and we have been encouraged to continue this important educational effort.

The annual general membership meetings held in November each year have been capstones for our yearly activities. Each year, nearly 200 people attend these events. This attendance and the many favorable comments we have received at the conclusion of each tell the Board that CNGA is addressing your educational needs.

In 1993 we published the Interim Restoration/Revegetation Guidelines. Development of these guidelines was no easy task considering the perspectives and philosophies brought to the effort. However, the ad hoc committee representing public agencies, commercial interest, and academia persevered. The product is in use and is helping to provide direction for restoration and revegetation efforts.

Our most important achievement is the continued publication of *Grasslands*, our "quarterly" newsletter. This is the foundation of CNGA's educational program and it has wide support.

For 1994, two spring technical conferences are scheduled. One will be conducted at the S&S Seeds' Las Flores Ranch near Santa Barbara, and another will be held at Hedgerow Farms west of the University of California at Davis and near the town of Winters. Each program will emphasize aspects of restoration not duplicated presentations at the other.

Two grass identification workshops will be included in 1994's activities if support can be coordinated. Logistics, including identification of instructors, are a challenge.

The 1994 Annual General Membership Meeting will feature updates on native grass research and restoration projects and guidelines for conducting the physical process of restoration.

With your support, the foundation of CNGA's educational program, *Grasslands*, will be published four times in 1994. Articles for publication from the membership and other sources are a constant need. Without this input, information about restoration projects and research results cannot be communicated widely. So, please respond to the editor's pleas and submit your articles!

Preparation of native grass descriptions has been initiated. These short profiles will help fill a longstanding need. They are being prepared in cooperation with the University of California at Davis. Several should be ready for publication before the end of 1994. (*They are the only item missing from the long-promised information packet.* —Editor's note)

I hope you have found membership in CNGA rewarding. The Board and its committees are doing their best to meet your needs. And remember, your participation in the Association's governance and committee activities determines how well CNGA fulfills these needs.

IN SEARCH OF NATIVE GRASS ECOTYPES in the San Francisco Bay area.

Redwood City Seed Co., Box 361, Redwood City, Cal. 94064
(415) 325-7333

Craig & Sue Dremann are co-owners of the Redwood City Seed Company. They have been studying native grasslands of California and the Southwest since 1979 and have ten booklets on native grass research in print. This is the second in a series of articles on their on-going research of the native grass populations of the San Francisco Bay area.

Part two: ENVIRONMENTAL INFLUENCES THAT CREATE ECOTYPES and some MORPHOLOGICAL MEASUREMENTS.

The Ecotype Survey Process or the G.R.I.D. (Grass Relic Identification™)

We began our 5,000 square mile, nine county native grass ecotype survey from the San Francisco Bay area in the summer of 1990. This was our first trial in what we now call our G.R.I.D. or Grass Relic Identification™ program. We began by doing some test collecting to see how long it might take to travel and gather seed samples from the entire area. We originally divided up the Bay area into a grid of 4 x 4 mile squares, and we wanted to collect at least one sample of each species from every grid-square, which would have given us up to 300 grass seed samples and a wealth of data. However, after conducting our test collection, it was obvious that it would be unlikely that two people would be able to collect from that many locations within one season.

In order to complete our collection within one season, we enlarged the squares of our grid to 16 x 16 miles or each square covering 250 square miles, and the Bay area was then divided into a grid of 20 manageable squares. In late June, 1991 we then set out to collect seeds from twenty individuals from of population we encountered and to collect from at least one native *Bromus, Elymus* and *Stipa* population per 250 square mile grid. Along with the seeds, we collected a plant specimen and took notes on location, associated vegetation, soil types, precipitation, etc.

One of the first things we discovered was the widespread and almost complete extermination of all species of bunchgrasses in most of the Bay area. In the coastal summer fog-shrouded counties (Marin, San Francisco, San Mateo and Santa Cruz) it was relatively easy to find relic populations in forested areas or on windswept hilltops because grazing had not occurred in these areas for 50-100 years. San Mateo county was the richest area in central California for relic grass stands, and in 8 hours of collecting we were able to find 7 populations of *Stipa* (3 *pulchra* and 4 *lepida*), 8 *Bromus* (7 *carinatus* and one *breviaristatus*) and 4 *Elymus glaucus populations,* or 2.4 populations per hour of travel.

In contrast to the coastal counties, Alameda, Contra Costa, San Benito, Santa Clara and Stanislaus counties are currently heavily grazed, and even the East Bay Regional parks and State parks have not been managed to protect native grass stands (or native herbaceous plants generally), and grazing has exterminated nearly all of the bunchgrass stands of those counties.

When we encountered a relic stand of native grasses, moss on the soil indicated old, undisturbed soil and the moss in turn seemed to inhibit weed grass seedling establishment. Weed grasses like wild oats (*Avena fatua & A. barbata*) and rip-gut brome (*Bromus diandrus*) were always found within a relic bunchgrass stands, but when the stand had a good density of natives, the weed grasses were depauperate. In other words, wild oats or rip-gut growing within a relic bunchgrass stand would only be 8" tall instead of a norm of 4 feet. The percentage of weed grasses within the relic bunchgrass stand was usually about 10-25% cover, as measured by canopy coverage at 18" above ground level.

Among other items of interest in our study, the lily family was occasionally present and whenever it was, the plants had a positive effect on the native grasses and an inhibiting effect on the European grasses. Native legumes were almost always present growing with the bunchgrasses and they became very important the further from the coast we traveled, having a striking beneficial effect on the grasses that they grew among. Mycelia of higher fungi (*Agaricus sp.*) were seen intertwined with the roots in summer on several species, having an especially positive effect on *Stipa* plants. And gumplant (*Grindelia*) had a firebreak-effect when a grass fire went through a *Stipa cernua* stand in Stanislaus county. There was one surprising beneficial European annual grass—*Brachypodium distachyon.* Whenever it occurred within a relic bunchgrass stand it seemed to keep the other Europeans at bay and allowed the natives to thrive.

Our collection gathered specimens and seed samples from 48 populations of *Bromus*, 32 populations of *Elymus glaucus*, and 38 populations of *Stipa* (Table 1). After keeping our eyes peeled for grass populations as we drove down hundreds of miles of windy mountain roads, we became aware of indicators of likely locations of relic bunchgrass stands. Along the coast, it was the presence of the bright red of the Indian Paintbrush, the tall maroon flower stalk of the California Beeplant and the yellow carpets of Lotus. The tall seedstalks of *Elymus glaucus* were ever-present flags in all forested areas to show the way to relic stands as the Elymus would be the last bunchgrass to be grazed out. In Blue Oak woodlands, we would look for *Melicas*, and in moist Coast Live Oak, tarweeds and Farewell-to-

Spring would light the way to the relics. On the edge of the Central Valley, the Great Valley Grindelia would be the flag we would be looking for and any time we saw serpentine outcrops, they stood as relic sentinels marking "this way to the relic stands."

Environmental/Ecotype Relationships

Within our study area, we saw different environmental influences which molded each grass species, each in a special way (listed in order of strength of influence):

1.) Windswept hilltops produced dwarf, prostrate populations, especially in *Elymus glaucus,* and with a lot of variation within the population.

2.) The extreme low rainfall edges for the species created unique populations.

3.) Coastal summer fog produced small seeded populations in all genera. (More about seed size in relation to the environment can be read in *Baker, 1972).*

4.) Serpentine soil produced unique populations, usually different from other non-serpentine populations, and with a lot of variation within the population.

5.) Elevation and soil moisture from increased annual precipitation shifted the flowering and seed ripening dates. (More about grass ecotypes and flowering dates can be read in *McMillan, 1959).*

Environmental Influences on Each Species

ELYMUS GLAUCUS—was present wherever oak woods or Doug fir occurred and also in open grasslands, but only in fog shrouded, windswept coastal hills. *Elymus glaucus* seemed to be the most sensitive of the native grasses to the environment, and the following factors created distinct populations of *Elymus glaucus*:

1.) Windswept coastal hilltops (Twin Peaks and Bernal Hill in San Francisco and San Bruno Mtn. in San Mateo Co.) produced dwarf plants, extremely stunted, with a large variation within the population. The seeds were awnless or nearly awnless. This windswept hill ecotype is recognized as a botanical variety *virescens.*

2.) Serpentine-soil produced depauperate plants and there was a wide variation within the population, and the seeds had long awns.

3.) Precipitation and elevation in relation to ripening date. Away from the coastal summer fog influence, the ripening of *Elymus* began at 200 ft. elevation on about July 1st and proceeded to ripen in relation to elevation or precipitation at the rate of 600 feet of elevation per week or 5 inches of annual precipitation per week. There may be no apparent morphological differences between populations, but ecotypes may be present in the form of flowering/ripening dates that do not overlap. If these dates do not overlap, they can create the equivalent of subspecies as pollen cannot be transferred between populations.

BROMUS CARINATUS—We were able to separate out *Bromus carinatus* from the other closely related species that occurred in our study area, *B. breviaristatus, B. maritimus & B. marginatus.* These are all valid species and sorting out of this complex is a story in itself and we will present our research in a future article. The environmental influences on *B. carinatus* were similar to those seen on *Elymus:*

1.) The coastal summer fog and moisture created small-seeded populations.

2.) The extreme low rainfall edge of the species (16" at Woodside in San Mateo Co.) created extremely hairy-leaved populations.

STIPA PULCHRA— Relic populations were fairly common in San Mateo County but were greater than 99% exterminated in the eight other counties, so it was frequently difficult to find many populations to compare throughout the study area. The environmental influences that we saw were:

1.) Coastal fog and moist summer influence created short awned populations.

2.) Serpentine soil created unique long-awned populations.

Elymus Glaucus: The Canary in the Coal Mine

Elymus glaucus appears to be the most sensitive species to local environmental conditions creating numerous ecotypes, and through our common garden work indicates that these morphological differences are genetically fixed. This could cause future headaches when using this species for revegetation as *really* locally collected seed may be essential to match the local genepool.

The positive view that we have of the numerous *Elymus glaucus* ecotypes is that they may serve to be like the canary in the coal mine, warning us when we may be entering an environmentally- created unique area of not only unusual ecotypes of grasses but perhaps many other plants. We call these areas the *genetic mine-fields* because we have to tread carefully until we know what is going on in those areas. Fortunately, *Elymus glaucus* gives us a lot of measurable plant parts that we can use to compare ecotypes and populations: seed awn length, seedhead length, leaf canopy height, leaf width, blueness or greenness of leaves, glaucousness or hairiness of leaves, number of seedstalks per plant, uniformity or non uniformity of seedhead lengths, etc.

Seed Zones

There were certain measurable morphological characteristics that we used to map grass populations, and the resultant maps show possible ecotypes and related populations. The *Bromus* map shows the hulled seed diameter measured in thousandths of an inch for each population sampled. The *Elymus* map shows the seed awn length in millimeters, and the *Stipa* map shows the awn length measured between the seed and first bend of the awn in millimeters. We also mapped the other major Bay area native grass species that we collected but have not compared them at the time of the writing of this article.

Varietal Identification through Isoenzymes

We have collected seed and specimens from populations of 108 native grasses and have noted the environmental influences that have shaped those populations. There are measurable parts of the plants (awn length, seed diameters, etc.) which reflect the relatedness between populations and those characteristics also seem to reflect environmental influences, which suggests that we are looking at ecotypes. Could electrophoresis be a useful tool to look at these populations?

We recently contacted Isolab Inc. (P.O. Drawer 4350, Akron, Ohio 44321). Isolab has an electrophoresis procedure that they have developed called HyPure® varietal identification and genetic purity assays using Isoelectric Focusing (IEF). They can send you a brochure that explains this procedure on request.

Linda S. Durig, Isolab's R&D electrophoresis scientist, ran a gel for us in September of 24 different grass populations: 7 *Bromus,* 14 *Elymus* and 3 *Stipas.* She bulked each sample and used 60 mg. bulked

seeds which were homogenized and the proteins extracted with a standard extraction solution. The samples were run on a HyPure® gel and stained for the esterase enzyme. As far as we know, this was the first gel ever run on any California native grasses, and the results look very promising. We will report our results in detail in the next installment.

Our Ecotype survey proceeded as follows (1991)

Date	Counties	number specimens
June 30	San Francisco & San Mateo	12
July 1	San Mateo	21
July 2	Santa Clara	11
July 11	Marin & Contra Costa	19
July 17	San Mateo	2
July 18	Alameda*	9
July 21	Alameda to Stanislaus	5
July 22	San Benito	5
July 28	Alameda, Santa Clara & Santa Cruz	14
Aug. 10	Napa	3
Aug. 12	San Mateo	1
Aug. 13	Contra Costa	0
Aug. 15	San Mateo	1
Aug. 18	San Mateo & Santa Cruz	4
Aug. 23	San Mateo	2

*Three of these were collected by Connie Millar & Diane Delany

Further Reading:

Baker, Herbert G. 1972. Seed weight in relation to environmental conditions in California. Ecology **53** : 997-1010

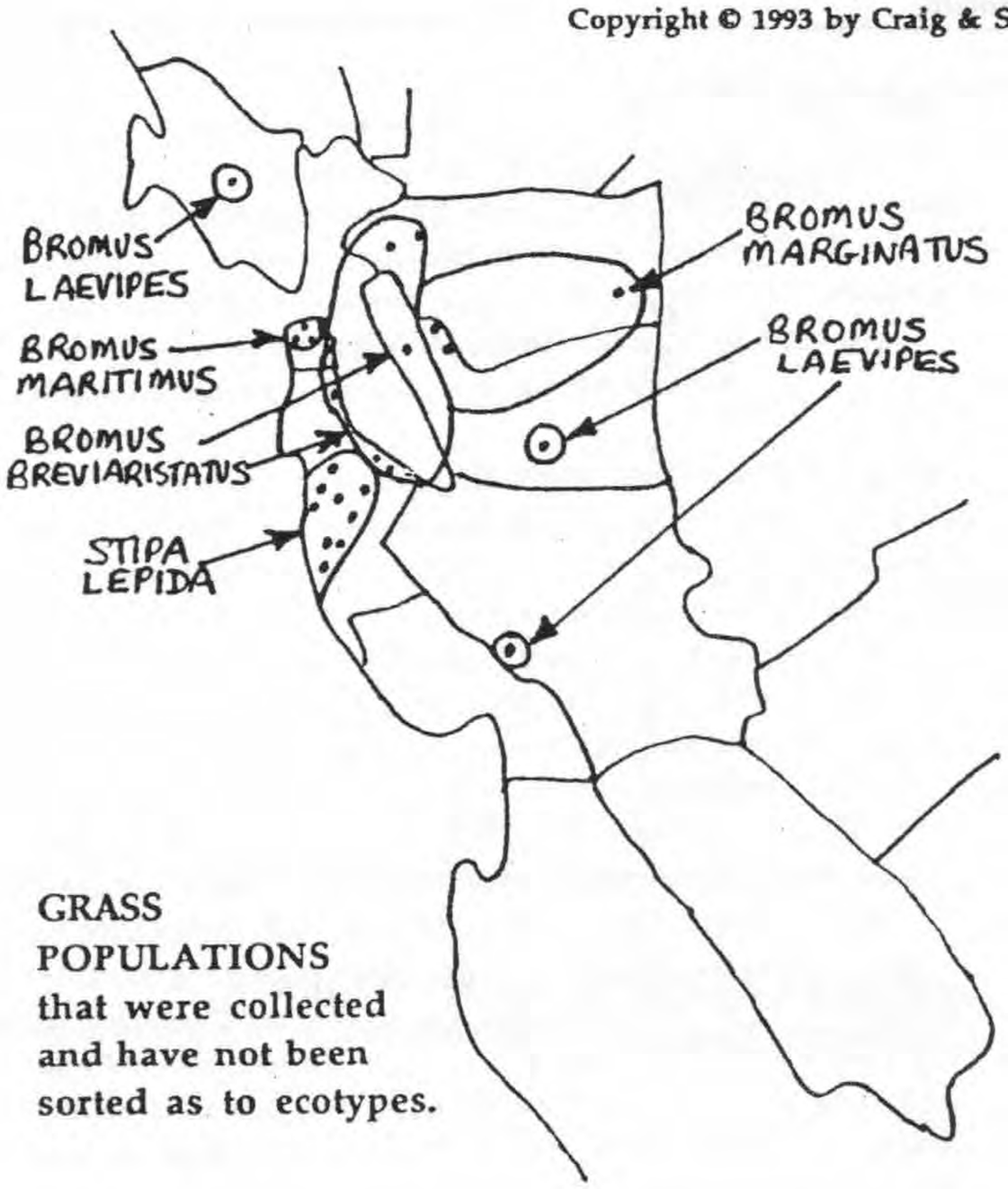
McMillan, Calvin. 1959. The role of ecotypic variation in the distribution of the central grassland of North America. Ecological Monographs **29**: 285-308

Future Installments of the Bay Area Ecotype Survey stories

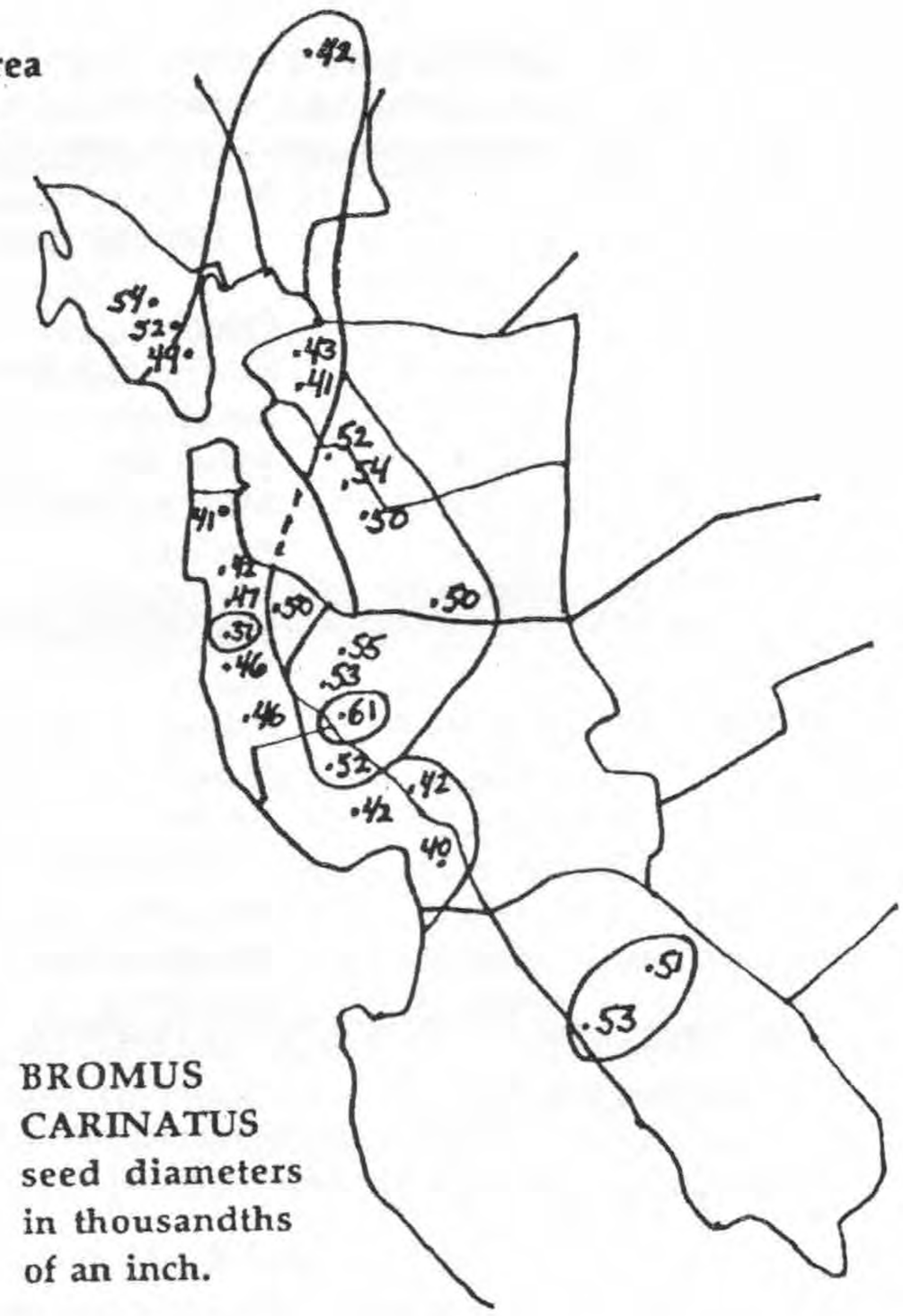
—The Isoenzyme Gels and Grass Ecotypes.
—The Solution to the *Bromus carinatus* puzzle.
—Common Garden Grow-outs.
—Flowering Dates & Seed Germination and Ecotypes.

IN SEARCH OF NATIVE GRASS ECOTYPES in the San Francisco Bay area

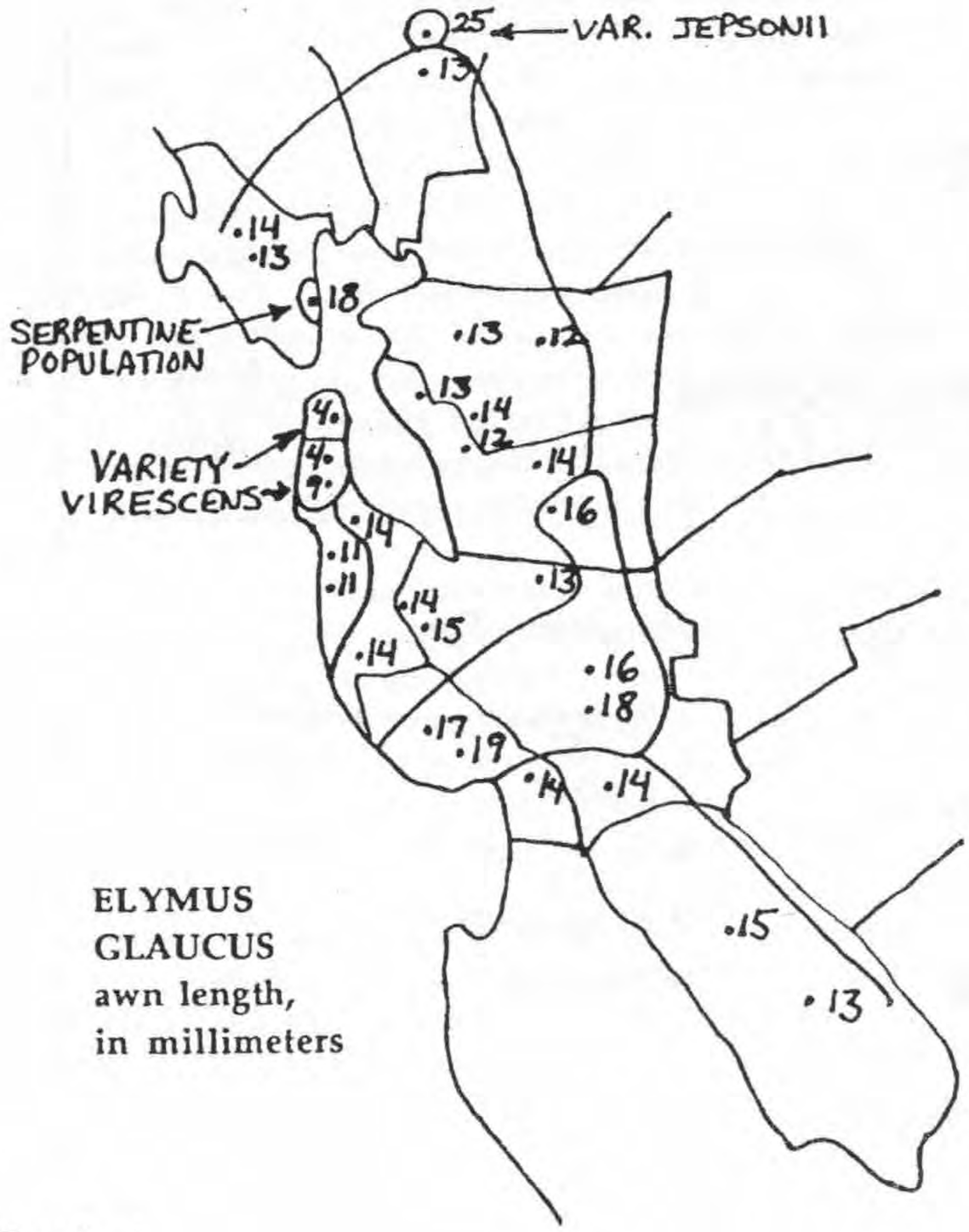
Results of the 1991 ecotype survey.



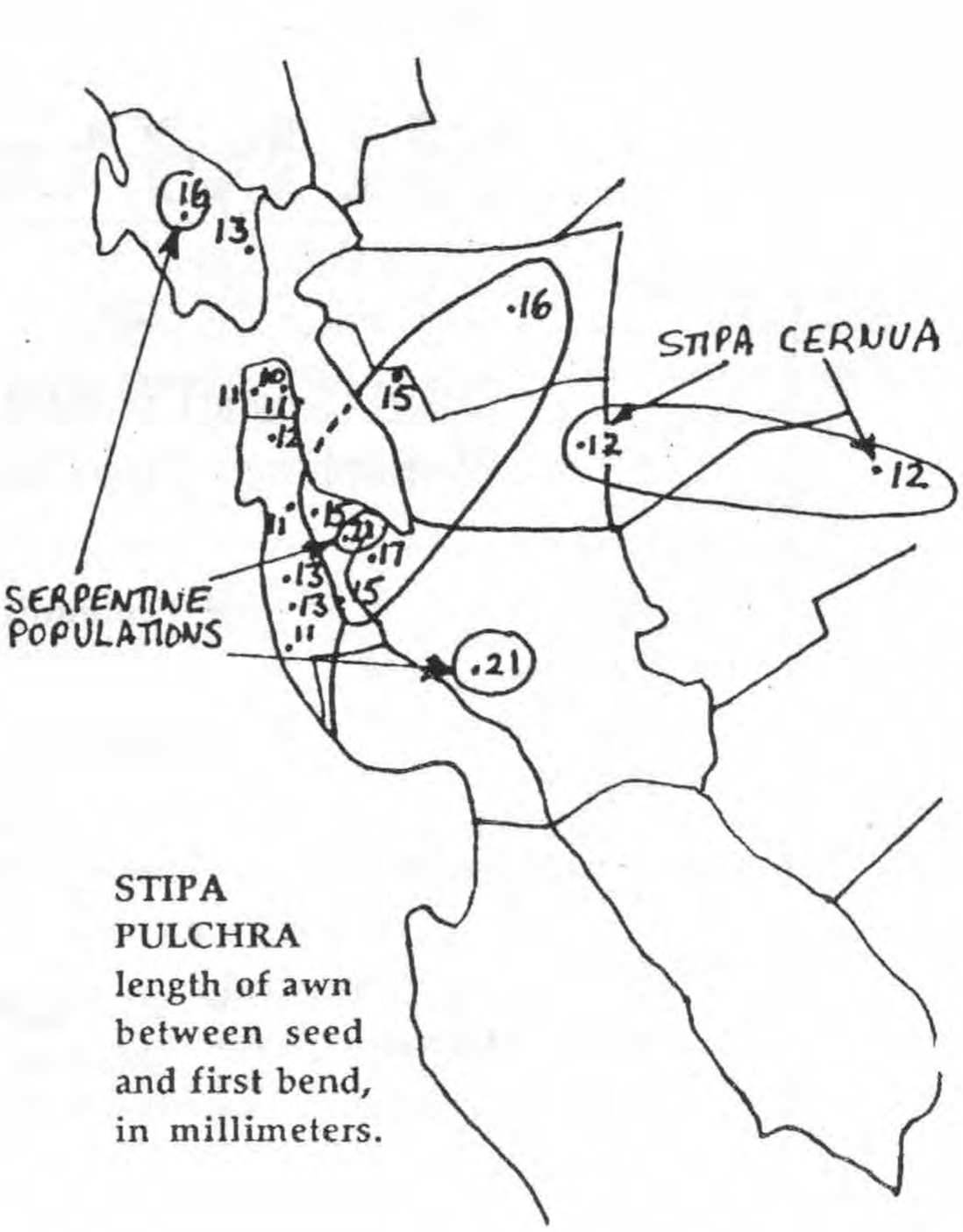
GRASS POPULATIONS that were collected and have not been sorted as to ecotypes.



BROMUS CARINATUS seed diameters in thousandths of an inch.



ELYMUS GLAUCUS awn length, in millimeters



STIPA PULCHRA length of awn between seed and first bend, in millimeters.

Letters to the Editor

30 December 1993

Dear Editor:

The following short chapter is from the book "As I Remember", pp. 159-160, printed in 1944 by author Nicolus Wilson Hanson. It is a collection of reminiscences about the Sacramento Valley around Willows in Glenn County in the 1870's through the early 1900's.

NATIVE WILD GRASSES AND FLOWERS

In early days in the Sacramento Valley there were thousands of acres of uncultivated land. Only the good land of rich loam along the Sacramento River and foothills was farmed to wheat. The poor grade of land was not farmed. This soil was know as black adobe, adobe clay, red gravel, alkali clay, alkali, and goose land. All these different varieties of soil were adapted to different varieties of native grasses.

In the spring these native grasses bloomed and went to seed. This and future generations will never see this great valley as I have seen it, blanketed with thousands of acres of the most beautiful wild flowers.

Snowdrops, a small while flower, would cover a field and make the field appear a great bank of snow. Another field of several thousand acres would appear like a bank of gold, covered with a small yellow flower. The stems of these flowers were fine and the pods were filled with a rich, fine seed. Cattle became fat and made excellent beef in June by grazing on that feed.

Another field of red, gravely soil would be covered with the state flower, beautiful yellow poppies. The next field would probably be bluebells and violets, and still another with redbells, a solid carpet of red. If you were fortunate you would see a field of the different varieties of soils combined with all the different varieties of wild flowers growing there in a great big bouquet arranged by Nature: poppies, Johnny-jump-ups, buttercups, primroses, modocs, purple lupine, bluebells, and many flowers I never knew the names of.

And oh! the beautiful bouquets of wildflowers we gathered when we were a child. The fragrance never to be forgotten.

In the spring shallow ponds of water would evaporate on the plains and a fine growth of vegetation would spring up and bloom thereon, the most beautiful velvet flower that contained all the colors of the rainbow. These flowers possessed the sweetest fragrance imaginable. All these beautiful pictures of Nature have been erased from this valley forever by civilization. Today we view the rice, barley, wheat, ladino and alfalfa fields, and the orchards.

If only Mr. Hanson had had the benefit of some botanic training to supplement his observational and descriptive abilities!

The close correlation of soil types with native grasses and wildflowers is not surprising but it calls to question some of the broad characterizations of the valley floor as a rather uniform Stipa (excuse me) Nassella pulcra grassland.

Sadly, Mr. Hanson is no longer around to identify any of the species described in his narrative. It is up to us to try to recreate the flora from his descriptions. What is the vernal pool species that is a "beautiful velvet flower" with "all the colors of the rainbow" and "the sweetest fragrance imaginable"? What were the different varieties of native grasses that were adapted to the different varieties of soil? What were "redbells", "modocs" and "snowdrops"?

If nothing else, Mr. Hanson's narrative presents an enticing view of "...these beautiful pictures of Nature" that "have been erased from this valley forever by civilization".

The Glenn County Library in Willows has a copy of "As I Remember". It was a limited edition book, printed primarily for friends and family. It is not available for circulation but can be examined in the library.

Ray P. Griffiths
P.O. Box 617
Georgetown, CA 95634
(916) 333-1299

CNGA Corporate Members

Jones & Stokes Associates

CNGA Life Members

Polly Anderson
Charlice Danielsen
Bob Delzell
Jim Eagan
David Gilpin
Charlotte Glenn
Paul Kephardt
Rod MacDonald
Eugene Majerowicz
Warren Roberts
Vic Schaft
Scott Stewart

January 27, 1994

Dear Editor,

In the last issue of *Grasslands* (October 1993), John Zentner discussed the important issue of "restoration success" in regard to the sustainability of grassland restoration and the need to develop performance standards and replicable monitoring techniques. Indeed, restoration projects should pass his two part test: 1) be adapted to the soil/site parameters and 2) not require continued human intervention to inhabit that site.

The Cherry Island golf course project is truly a good example where enthusiasm and shortsightedness failed this test. However, there is more to the story. The first planting was a failure, not only because the species selection was inappropriate but also because site preparation was inadequate. As Technology Chair for CNGA, I visited the site with Jeff Hart and strongly advised against the species selection and also recommended proper site preparation and weed control techniques before attempting another seeding. Unfortunately, the seed had already been purchased, however the subsequent weed control and seedbed preparation were much improved. This led to the enthusiastic response referred to by Zentner, reported in the *Grasslands* "News Briefs and Trends" (July 1991). Meanwhile, the California brome, blue wildrye, and "Molate" fescue could not endure the heavy clay soils/hardpan with extreme compaction/ hammering by golf carts. In my CNGA Technology Committee Report (*Grasslands*, October 1991), referring to Cherry Island, I stated in bold print: "**use the right plants and the right site!!**".

Zentner went on to cite my grassland restoration article in *Grasslands*, (October 1992), stating that I "claimed that plug planting of Idaho fescue (*Festuca idahoensis*) was successfully used to restore an eroded trail on Mount Tamalpais in Marin County". For accuracy the "success" of this project was due to an overall restoration plan that also included rerouting the trail, ripping the compacted soils, jute netting, and seeding locally collected, short-lived native perennial grasses. Somehow John assumed that the "project had been in the ground about 2 months when this statement was published and the winter rains had not yet arrived." The project, in fact, had been in the ground 12 months. The plugs performed admirably (98%) survival) despite the drought and the fact that supplemental water was not available.

Zentner concluded his example paragraph with a partial quote by me that I feel needs to be sated in its entirety: "Plug planting of selected, long-lived perennial grasses (purple needlegrass, California fescue, tufted hairgrass, etc.) is another important restoration technique for areas that are compacted, shady or vernally wet (Amme, 1985)" (emphasis mine). While this is not one of the best topic sentences I have written, I believe it is accurate and represents over 10 years of plug planting experiments. In many situations, grass plugs often establish and thrive where seedlings do not. It is a good idea to try to break up compacted soil before planting plugs, as I did on the Mount Tamalpais trail restoration project. Shady sites, sites with north exposures (California fescue), and sites that have soils that do not dry out too fast in the spring (tufted hairgrass, red fescue, Idaho fescue, creeping wildrye, etc.), sustain long-lived (adapted) native grasses where there is also weed competition and summer drought.

Citation: Amme, D. 1985. Nursery production of western native perennial grasses for site stabilization. **In** Proc. Con. XVI International Erosion Control Assoc. Feb. 21 & 22. pp. 149-153.

David G. Amme
Resource Restoration and Management
1504 Beverly Place
Albany, CA 94706

ANNOUNCEMENTS

POSITION AVAILABLE

Agricultural Programs Manager, The Nature Conservancy, Consumnes River Preserve, Galt, CA. Initiate wildlife compatible farming and grazing program. Administer leases, and develop low pesticide outreach program. 2 year position, salary according to experience. Send cover letter and résumé to Patti Brady, The Nature Conservancy, 785 Market Street, San Francisco, CA 94103. Closes April 15.

Quail Ridge Conservancy

Spring walks and get togethers, annual meeting.
Several dates this spring
For more information, contact:
Frank Maurer, Director
916-758-1387

Work Ranch Walkabout Workshop

May 14-15, 1.5 days
Program includes, (but not limited to): dry-land farming, 10 years no-till farming, wildlife management, planned grazing, watershed demonstration, native prennial grass development, natural oak regeneration, control of brush and erosion by cattle, straw bale home construction, on site anti-freeze recycling
partly funded by a grant from Sustainable Ag Research and Education Program, UCDavis
ATTENDANCE WILL BE LIMITED
$30 charge to cover lunch, handouts
For more information, contact:
George Work, 805-467-3233

We regret the extreme tardiness of this edition. The CNGA computer has required unscheduled servicing twice this year, hampering newsletter production. Our apologies to our readers and advertisers.

Kitren Weis, Editor

CNGA FIELD DAY
AGENDA
MAY 14, 1994

7:00 a.m. - 8:00	Vendors and set up table tops
8:00 - 9:00	Registration; Continental Breakfast
9:00 - 9:30	PATTIE GOUVEIA, CNGA President CNGA Business, etc; Introduction of Speakers
9:30 - 10:00	KEYNOTE SPEAKER (To be announced)
10:00 - 10:30	NANCY VIVRETTE, Ransom Seed Laboratory "Testing Native Grasses in a Laboratory"
10:30 - 11:00	BREAK
11:00 - 11:30	VICTOR SCHAFF, President, S & S Seeds "Ensuring Project Success Through Specification Writing"
11:30 - 1:00	LUNCH View Vendor Displays
1:00 - 2:30	PANEL DISCUSSION ■ John Haynes, CALTRANS ■ Nancy Vivrette, Ransom Seed Laboratory ■ Victor Schaff, President, S & S Seeds ■ Government Agency Representative (To be announced)
2:30 - 4:00	TOURS AND FIELD DEMONSTRATIONS

LOCATION: S &S Seeds, Rancho de las Flores facility (Santa Barbara CO.)

■ 101 North: exit Los Alamos/ Vandenburg, drive through Los Alamos, left HWY 135/Vandenburg

■ 101 South: exit Los Alamos, right HWY 135/Vandenburg

Rancho de las Flores is four miles from Los Alamos on HWY 135 (2557 HWY 135);

Phone: (805) 344-4812

REGISTRATION FORM

Please return this form and payment to register for CNGA's Spring Field Day at S & S Seed's Rancho de las Flores facility. The Field Day fee is $70.00 for members, and $105.00 for nonmembers (nonmember fee includes one-year membership to CNGA). Student fee is $50.00. Spousal fee is $25.00. The fee includes lunch. Please remit by May 6, 1994, making check payable to "CNGA." Send check to: CNGA, P.O. Box 566, Dixon, CA 95620, Phone: (916) 678-6282.

Please type or print all information:

NAME:_____

ORGANIZATION:_____

STREET:_____ CITY:_____ STATE:_____ ZIP:_____

PHONE:_____ FAX:_____

❒ $70.00 CNGA member ❒ $105.00 Nonmember ❒ $50.00 Student ❒ $25.00 Spouse of CNGA member

❒ If you cannot attend the Field Day, but want to become a CNGA member, send a check for $35.00 to CNGA..

California Native Grass Seeds
Wildflower & Erosion Control Blends
Hydroseeding & Reclamation Mixes
Consultation

Pacific Coast Seed

Inc.

Wholesale Seed to the Restoration
and Reclamation Industries

7074-D Commerce Circle • Pleasanton, CA 94588
(510) 463-1188 FAX (510) 463-1941

Conserva Seed

A division of
Stewart Family Farms

California's Number One producer of native grass seeds.

Meadow Barley • Blue Wildrye
Purple Needlegrass • California Brome
California Red Fescue • Zorro Fescue
Molate Fescue

pasture improvement • soil stabilization and erosion control • cover crops • ornamental ground covers • wildfire reseeding wildlife habitat restoration

P.O. Box 455
Rio Vista, CA 94571
(916) 775-1646

Valley Transplant Company

23000 Bruella Road, Acampo, CA 95220
209-368-6093

Specializing in native grass transplants

- Inexpensive plugs—cells 1 1/4" x 1 1/4" x 3"
- Price dependent on quantity and grass species
- Must receive seed/order for propagation by August 1
  for delivery in October-November
- Fall propagation for mid winter/early spring planting
- Custom seed collecting services available

Price per species/accession

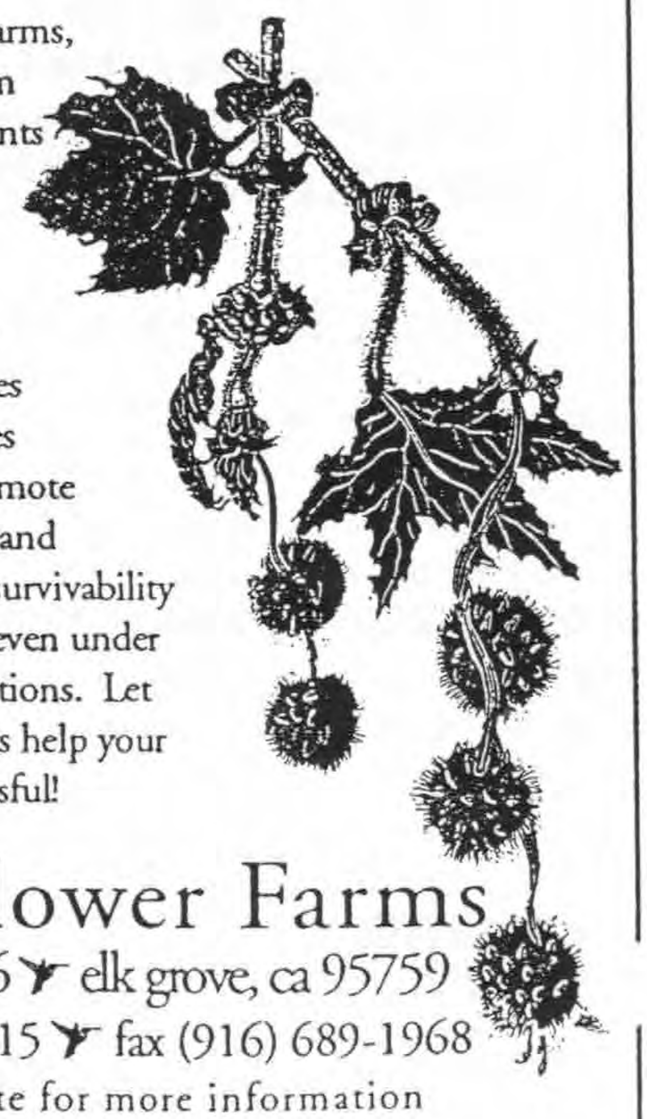
- $.05 each for 20,000+
- $.07 each for 10,000-20,000
- $.10 each for 5000-10,000
- $.12 each for 5000 or less

* Remember: Collect seed now for propagation in fall. Plan for plugs to be ready in 6-8 weeks after planting in greenhouses.

* Warm season grasses must be started by May 1st.

RETURN OF THE NATIVES

At Cornflower Farms, we grow premium quality native plants for wildland restoration, landscapes and agriculture. Our containerized trees shrubs and grasses are grown to promote vigorous growth and greatly improve survivability at out-planting; even under harsh field conditions. Let our quality plants help your project be successful!



Cornflower Farms

p.o.box 896 ➢ elk grove, ca 95759
(916) 689-1015 ➢ fax (916) 689-1968
Call or write for more information

Join The Native Grass Association

Date_____
Name_____
Title_____
Organization_____
Address_____
City/State/Zip_____
Phone/FAX_____

Membership Satus

Regular	$35/year
Student	$20/year (include school, grad. yr.)
Retired	$20/year
Life	$350
Corporate	$500/year
Associate	$100/year

Benefits: Regular, Student, Retired, or a business on a Regular Membership—1 person at member rates at functions; Family, Commercial or Associate—all members of group at member rates.

Donations: In any category designated (see committees), to support CNGA in its efforts to Develop, Promote, and Restore, I am enclosing a donation of $_____ for _____.

Donations are tax deductible to the extent alloowed under federal and state law.

Dues are for the Current calendar year, up to November, at which time dues paid are for the next year.

Detach and mail to:
California Native Grass Association
P.O. Box 566
Dixon, CA 95620

ATTENTION COMMERCIAL MEMBERS!!

Do you want to be included in the CNGA Procuct and services Directory? If so, please provide the information below and we will ad you. See the following sample:

Agriculture-Renew
1710 Airport Rd.
Weatherford, OK 73096
Phone: 800-858-1148
Contact: Weldon Miller
Area Served: United States
Flail vac, seed collecting
and harvesting equipment

Company:_____

Address:_____

City, Sate, Zip:_____

Phone/FAX:_____

Contact:_____

Area Served:_____

Description:_____

_____

California Native Grass Association
P.O. Box 566
Dixon, CA 95620

RECYCLED PAPER

Non-Profit Org.
U.S. Postage
PAID
Permit No. 19
Dixon, CA