



GRASSLANDS

The Newsletter of the California Native Grass Association (complimentary copy) Vol. 2 Issue 1 July 1991

NOTES ON NATIVE GRASSES

by Judith Lowry

I. California Native Bunchgrasses, A Little Background:

Our beautiful native grasses have been discovered. The complex and rich grassland ecosystem that used to cover 33% of California is currently the subject of much interest from federal and state agencies, conservation and restoration groups, and even the home-owner.

What happened to the formerly luxuriant stands of native grasses? As in the case of the disappearance of California wildflowers, the "Notorious Gang of Four" is responsible:

1. Grazing by cattle and sheep instead of by the interlocking mosaic of browsers and grazers, such as pronghorn antelope and tule elk combined with deer, that evolved with the bunchgrasses.
2. Cultivation and its attendant changes in water patterns.
3. Suppression of natural fires and cessation of man-induced fires.
4. The rapid spread of European weeds and grasses that are adapted to the above factors.

Some botanists consider California to be divided into Coastal Praire (dominated by *Festuca* and *Danthonia* species) and the Valley Grassland (dominated by *Stipa* and *Poa* sp.) In the latter situation, such as in the Central Valley, some feel that the hold of European annuals is so strong that it cannot be broken, and they are in effect "new natives." Relict stands can still be found in some areas, such as Jepson Prairie, owned by the Nature Conservancy.

Along the coast, however, the fog gives bunchgrasses an edge over annuals, keeping them growing most of the season, and many relict stands can be found along the North Coast, some even surviving with cattle grazing, when it is managed correctly. The seeker of native bunchgrasses will be rewarded many times in the Pt. Reyes area and on up the North Coast.

II. Looking for Bunchgrasses:

Although it is estimated that bunchgrass territory now includes only 1% of California, they are still around. You are probably passing clumps, masses, or even whole fields of them on most hikes into wilderness areas. The key to discovery lies in becoming familiar with bunchgrass

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PRESIDENT'S MESSAGE



by Robert Delzell

I'm excited to report to you that a number of membership efforts are moving the Association towards our goals. Let me highlight some of the accomplishments since our last newsletter.

EDUCATIONAL CONFERENCE. Elkhorn Ranch has offered to provide logistic support and a site to hold our May 2, 1992 educational conference. Elkhorn Ranch is owned and operated by David Packard, co-founder of the Hewlett-Packard Company. Significant work is in progress at the ranch in developing native plants for restoration and waterfowl habitat. The conference should be one of the highlights of the CNGA year and I want to invite organizations and individuals to attend and support this event. Contact person is Patricia Gouvia, Chairperson, Public Information and Education Committee, at our Dixon office or call 916 662 3615. Watch for more details in the fall issue of GRASSLANDS.

ASSOCIATION MEMBERSHIP is growing at a steady pace. We are well over the 100 mark of members and should achieve our 1992 goal of 1,000 members. Invitations for membership have been sent to a mailing list of 2,000 persons. Members are encouraged to share copies of the brochure describing our goals and copies of the Grasslands with others who may have a special interest.

FUNDING DRIVE FOR CNGA. The Funding Committee needs information from members and others on foundations, business firms, and agencies who may be interested in becoming project sponsors or making contributions to the Association. Please contact Charlotte Glenn, Treasurer of CNGA, if you know of a funding contact which she or others can pursue.

THANKS are in order to: JOHN ANDERSON for representing CNGA in a collaborative effort with the Nature Conservancy, the Bureau of Land Management, and Ink Creek Ranch on restoration planning for two large land areas; to DAVE DYER of SCS for his initiative in working with the the CNGA Technology committee to develop a Grass Adaptability Table; to ELKHORN RANCH and PATTIE

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NATIVE GRASSES

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appearances.

Bunchgrasses, unlike sod-forming grasses used for lawns, send up vegetative shoots every year from a central, perennial crown. Young vegetative stems grow upward with the enveloping basal sheath. Another interesting characteristic of certain bunchgrasses, such as the handsome and adaptable California Fescue (*Festuca californica*), is the formation of a "skirt" at the base.

Look for bunchgrasses where the Notorious Gang of Four are not favored. Serpentine soil is of course the classic case of inhospitality to European weeds and grasses, and serpentine areas are marvelous for bunchgrass-viewing. Fencerows, rights-of-way, places that for one reason or another have never been grazed, are all good bets. Once your eyes have been opened to the growth habits and appearances of bunchgrasses, you'll wonder how you missed them.

III. Deeper Ecological Significance of Bunchgrasses.

Since the vanished bunchgrass prairies of California captured our imagination, examples from the literature of situations in which the demise of these ecosystems has had far-reaching consequences seem to leap out at us. Many such consequences will probably never be discovered because the species changeover was so sudden and complete.

1. Let's begin with the obvious changes in the landscape. The shortgrass wildflower fields, such an irreplaceable part of the California landscape, are dependent on the ancient combination of wildflowers and perennial grasses for their maintenance. The replacement of perennial grasses with annuals spelled the demise of many a dazzling wildflower shows.

2. Bunchgrasses have massive fibrous root systems that do a magnificent job of holding onto soil. The above-ground stems, unlike those of annual grasses which have just begun to germinate, are already in place to soften the impact of rain on the soil when the fall rains begin.

3. In some situations, since bunchgrasses are alive, though somewhat dormant, through the "fire time" in California, bunch grasses burn more slowly, lessening the chances of the violent firestorms we have dealt with in recent years. Where some moisture or shade exists, bunchgrasses hold onto their

green much longer than annuals, some all year round to some degree.

4. It has been suggested that problems with oak regeneration may be related to the loss of the bunchgrass sublayer that used to be part of the oak savannah. Bunchgrasses make good nurse plants, for germinating acorns, providing snug nests where acorns can lodge and make protected early growth.

5. The reintroduction of the Tule Elk into formerly held territory has been hampered by disease problems, some nutritionally-related. Perhaps the Tule Elk misses its long associate, the native bunchgrass. One of the reasons that cattle grazing has been so devastating to many of the bunchgrass species is that the bunchgrasses are considered "ice cream" by cows and sheep and are accordingly heavily grazed. If grazing is allowed when bunchgrasses are storing food, the plants are weakened.

6. The California Quail requires habitat that bunchgrasses provides, with spaces in between the bunchgrasses for the broadleaved forbs that provide greens and seeds for the quail.

IV. Bunchgrasses and the Homeowner.

Let us explore some of the ways that the homeowner can use bunchgrasses:

1. Bunchgrasses can be part of a meadow situation of great beauty. Planting huge areas with California wildflower seed leaves the homeowner with masses of dead annuals from mid to late summer. Including bunchgrasses in the planting creates a healthy meadow, with the grasses providing the backbone of a viable and permanent wildflower field.

2. Numerous little "grass gardens" can be planted where the different bunchgrasses are grouped with an eye to their design potential. A backing of a group of handsome Pacific Reedgrass plants (*Calamagrostis nutkaensis*) in coastal areas or Deer-grass (*Muhlenbergia rigens*) in inland areas can be fronted by the upright-growing California Fescue with an edging of low mounding deep green Coastal Hairgrass. Or one might use *Melica imperfecta* to encircle the trees in an orchard. Some orchardists feel that once they are established, fruit trees thrive with a perennial cover crop.

3. In situations requiring erosion control such as banks, driveways, and road cuts, one might consider an appropriate and lovely mass of whichever bunchgrass is local to the area. Blue-green Idaho Fescue, flowing

PRESIDENT'S MESSAGE

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TIGHE for the commitment to host the educational conference; to PAUL KEPHART for his editorship of the GRASSLANDS; to PATIE GOUVEIA for the development of the CNGA brochure; to SCOTT STEWART of Conservaseed for the excellent open house at Conservaseed's Farm and for including CNGA on the program; and to the CALIFORNIA ASSOCIATION OF CONSERVATION DISTRICTS (CARCD), their Directors, and Betty Harris for handling the Association's mail and helping us get organized in our Dixon office.

CNGA is strong, active, and growing thanks to you, the members. Our restoration, conservation, educational, and environmental goals will be reached with your continued participation and support.



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Red Fescue, or the stately California Fescue will make stunning design statements on banks and slopes.

4. Research indicates that the native bunchgrass meadows were actually quasi-agricultural fields maintained by burning and harvesting. Parched and ground grass seed was frequently offered to early explorers. It seems that far from being a people without agriculture, the native Californians on the contrary had mastered what some think is the most advanced type of agriculture, i.e. (Permaculture) wherein crops gathered from perennial plants which do not require replanting, are regularly and reliably available.

by John Haynes, Transportation Erosion Specialist, CALTRANS

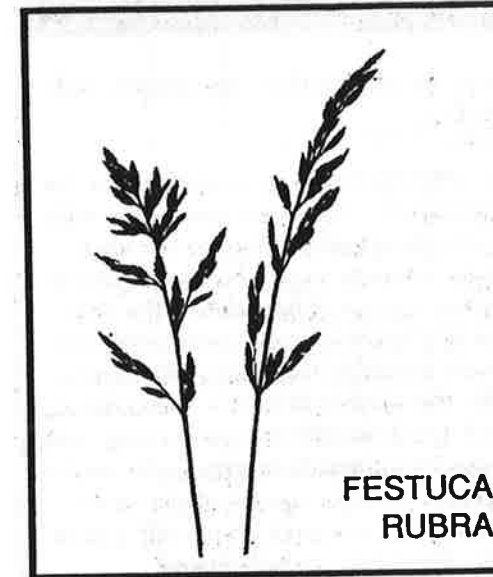
Grasses are often the vegetation type recommended for erosion control. Because of California's similar type of climate, many Mediterranean annual grasses have been recommended for this purpose. They have been chosen because they sprout and grow in the fall with the earliest rain and provide a dense vegetative cover for erosion protection. They are also generally available and inexpensive. The selection of these grasses also revolved significantly on how good they were as cow feed.

For years, annual ryegrass was the standard used for erosion control. As specifiers became aware of some of the problems associated with this species, such as high fertility requirements, biomass production and allelopathy, brome became a common replacement. These species did very well as long as they had sufficient rainfall.

The fertile topsoil is rarely saved and replaced on highway projects. The road sides are commonly constructed of earth that has never been exposed to air, sunlight, vegetation or soil micro-fauna. With these soils, the biologic mechanisms are not available to decompose and recycle nutrients. The fertility that is necessary for plant growth is derived primarily from synthetic fertilizers. Legumes are often included in erosion control mixes for their ability to fix nitrogen. But if they are not properly inoculated with effective Rhizobium, or they are planted with more aggressive grasses which have been heavily fertilized, the legumes may not survive the competition. As the fertility level declines, so does plant cover. The reduced plant cover allows for the invasion of weeds.

Throughout much of northern California, the roadsides have been invaded by yellow starthistle (*Centaurea solstitialis*). This summer-maturing annual plant was introduced from Europe and is now a widespread noxious plant, infesting over 8 million acres. The vegetation used for erosion control and maintenance practices have helped to allow this weed to establish on highway right of ways, and from there to neighboring fields. There are several reasons for this plant's success as a weed; it has large juvenile rosettes that shade neighboring plants; a large seed output and long germination period; efficient use of water and little insect predation or pathogen injury. It also has a taproot that extends below the zone of root competition from annual plants and is able to exploit the

CALTRANS LOOKS AT NATIVE GRASSES



FESTUCA
RUBRA

residual soil moisture not used by winter annuals. (Ref: Craig Thompson, et al,

California Agriculture, V43, No.5.), John Anderson, a veterinarian at U.C. Davis and a native grass enthusiast, has had some success with using Perennial grasses to control weeds on noncropped borders of fields and orchards. Because of his success and encouragement, and the environmental mitigations for some CalTrans projects that required the use of native grasses, it was decided that research was needed to evaluate the benefits of perennial grasses for erosion and weed control.

CalTrans' Division of New Technology, Materials and Research, has recently entered into a minor research contract with the University of California at Davis to evaluate the use of perennial grasses.

The research is being conducted by Professor John Menke, John Anderson, and Ted Adams, U.C. Cooperative Extension. The primary objective of the research is to determine the effectiveness of roadside weed communities, especially yellow starthistle.

It is expected this study will demonstrate that perennial grasses can out-compete and largely eliminate roadside weeds. The establishment of perennial grasses is also advantageous because they can reduce fire danger by remaining green longer in the year. Maintenance costs can be reduced by the need for only one mowing per year and reduced herbicide spraying. With reduced maintenance, the roadsides will be more habitable to wildlife. Native species are expected to be particularly useful because they are evolutionarily adapted to California's climate conditions; they can survive on existing rainfall patterns, and they green up earlier in the fall and remain green longer in the summer.

This research project will take place near the U.C. Davis campus in the Interstate 80-113 interchange. Eight species of perennial grasses will be used in a randomized complete block experimental design. Six blocks will be used with each block being subdivided into eight 25' x 16' plots containing each species in random order. One 25' x 16' plot will serve as a control. Each of the blocks were chosen in areas with dense stands of yellow starthistle.

Six of the species selected for this study are California native grasses, five of which are native to the Sacramento Valley. The seventh and eighth species are introduced and have been selected because of their known effectiveness and adaptability. They will serve as standards to compare with the natives. The species to be planted are: *Festuca rubra*, *Festuca ovina*, *Elymus glaucus*, *Bromus carinatus*, *Hordum brachyantherum*, *Elymus triticoides*, *Stipa pulchra*, and *Agropyron trichophorum*.

The schedule for planting was intended to begin in September with seed bed preparation which would include mowing and discing. In October, the areas were to be pre-irrigated with a water truck if rains had not occurred. The truck watering was later abandoned as too expensive. As the weeds emerged, they were to be killed with a general herbicide such as glyphosate. Seeding would follow in late November, and broadleaf herbicide would be applied in the early spring. Quadrat samples were to be measured on a monthly basis throughout the summer and leaf area, biomass and density of established plants were to be determined by using random sampling. Long term monitoring would be continued to determine the long-term effectiveness for perennial grass competition on roadside weeds.

As might be deduced from all the "were's" and "to be's" in the preceding paragraph, this research was not carried out as planned. The continuing drought gave concern that the plantings would not be successful. In hopes of more precipitation next year, this project has been delayed. When this research is completed, it is anticipated that a supplemental project will be undertaken to determine cost effective ways to establish perennial grasses on the existing extensive highway right of way.

In the meantime, native grasses are being specified on a number of CalTrans erosion control projects. As additional experience is gained in how to use these species, more native perennial grass plantings can be expected.

NEWS BRIEFS & TRENDS

1. Soil Conservation Service. The SCS is requesting the collection of two important perennial grasses from local sources. The species are: *Stipa pulchra* and *Melica imperfecta*. The plants collected will be used in a testing block to select superior strains. Please contact either Bob Slayback (916-448-2857) or Dave Dyer (209-727-5319) for further information. All seed should be sent to the Lockeford PMC, P.O. Box 58, Lockeford, Ca., 95237.

2. Native Plants doing great on Cherry Island Golf Course. Scott Stewart of Conservaseed and Jeff Hart, Sacramento County ecologist, report that the second native grass plantings at Cherry Island are entering the three leaf stage and are "looking great." "This project demonstrates how important proper seedbed preparation and good soil-seed contact really is. ...over 90% of native seed planting failures are due to inadequate or improper seedbed preparation and the resulting poor soil-seed contact and/or a poor weed control program resulting in excessive weed competition. Mother Nature is planting her seeds at a yearly rate of 100 to 300 lbs. per acre. Without a plan to deplete or reduce the weed seed reservoir, 30 lbs. of native seeds don't stand much of a chance," says Stewart. (Editor's note: Thanks,

Scott, for sharing these key insights with all of us.)

3. PG&E Studies Alternatives to Herbicides. PG&E has contracted with Prunuske Chatham, Inc. to set up test plots to study vegetative management without the use of herbicides. The objective is to maintain a soil cover so that erosion is minimized and foot traffic is possible. The cover must be low maintenance, have low flammability, be low growing, and it should not require irrigation after establishment. Native species alkalai sacaton, *Sporobolus airoidies* and salt grass, *Distichlis spicata* are being tested.

4. Davis introduces Native Grasses into the Urban Landscape. Beginning in 1989, the city of Davis has begun and is using native grasses as a component of the urban landscape. An important aspect in an urban planting is the combination of values that might be realized with native species. These values include: utility, drought-resistance, low maintenance, and aesthetics. Initial broadcast seeded areas were failures due to lack of rain. Sites that were irrigated and plugged are doing very well. The *Stipa pulchra* is setting seed.

GRASSLANDS, the newsletter of CNGA, reaches 2,000 individuals representing agencies, land managers, restorationists, production and marketing persons throughout California. Environmental, restoration, and ecological land use interests are converging forces creating a demand for native grasses, restoration, and consultation services.

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Send camera-ready copy and checks to Editor, Grasslands, Circle M Ranch, Big Sur, Ca., 93920. A written confirmation of ads received will be provided.

EDITOR'S NOTES — ANNOUNCEMENTS

EDITOR'S NOTES and ANNOUNCEMENTS.

CNGA has 145 new members since our last newsletter! Space does not permit a listing of your names and organizations in this newsletter. A directory of all CNGA members will be prepared and sent to all members in the near future. Until then, welcome aboard and many thanks for your encouragement and support.

Questions to ask and concerns for the future. What are your ideas, questions, and concerns for development and applications of native grasses? What do you think are the most important research objectives and agenda for CNGA? As a restorationist, land manager, rancher, or landscape architect, what are your expectations and limitations for utilizing native grasses? Letters to the editor welcome. Send inquiries and letters to: Grasslands Editor Circle M Ranch Big Sur CA. 93920.

The fine illustrations seen in this issue were rendered by Annalise Miller. Many thanks.

Announcements—Mark these dates.

August 20, 1991. The first meeting of CNGA in southern California will be held on the 2nd floor of the Ontario Airport Terminal building. Purpose of the meeting is to invite participation of members in planning activities and addressing plant material needs. Contact Chuck Goudey (415-705-2876) for additional details.

August 29, 1991. A Fall workshop for CNGA is being organized by John Anderson, Winters, California. The focus of the workshop will be the use of native grasses for roadside management. A box lunch will be provided. Workshop fee: \$10.00 for CNGA members, \$35.00 for non-members. Application for attendance and workshop deposit should be sent to our Dixon office no later than August 20, 1991.

November 14, 1991. The annual meeting of CNGA will be held at Heather Farms, Pleasanton, California. The program will include technology presentations, a plant sale to benefit CNGA, and election of officers. Meeting details coming soon.

May 2, 1992. The annual educational conference of CNGA will be held at Elkhorn Ranch, Moss Landing, California. The program will include demonstrations and applications of native plants for restoration and wildlife habitat. Look for further details in coming newsletters.

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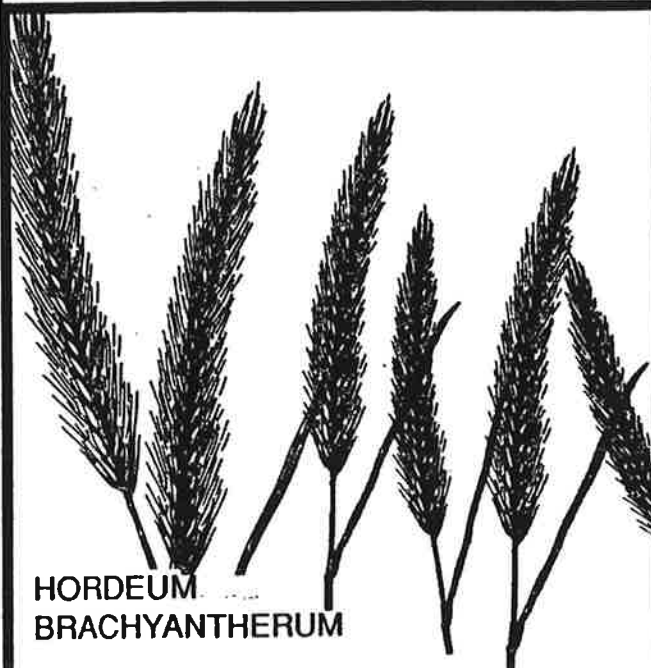
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BOOKS AND PUBLICATIONS

REDWOOD CITY SEED CO. PUBLICATIONS:

DISTRIBUTION OF NATIVE GRASSES IN CALIFORNIA.

By Beetle., 1947. \$5.00

GRASSES OF CAL: DREMAN'S DISTRIBUTION MAPS.

1987 30 species. \$4.00

GRASSES OF EUROPEAN ORIGIN AND THEIR IMPACT UPON CAL. BUNCHGRASS

(*S. pulchra*) by Dremann. 1989. \$3.50

HOW TO IMPROVE NEEDLEGRASS RANGE IN SAN DIEGO COUNTY, CAL., By Young.

Classic work by S.C.S. \$3.00

PRAIRIE RELICS: A guidebook based on Dr. James Barry's 1971 survey and maps. Ed. by Dremann. 1988. \$6.00

SEED TESTING OF CAL. NATIVE GRASSES; Germination. By Dremann. 1988. \$3.00

CALIFORNIA GRASSLAND RESTORATION LITERATURE (Bibliography) By Keeley and Halvorsen. 1990.

400 cites. \$7.00

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By Beetle., 1947. \$5.00

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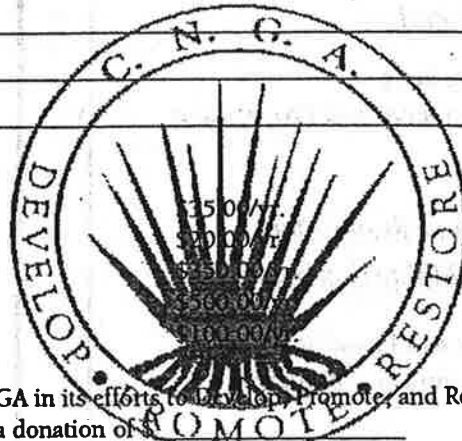
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