
CalEPPC NEWS

NEWSLETTER OF THE CALIFORNIA EXOTIC PEST PLANT COUNCIL

VOLUME 3 • NUMBER 1

WINTER 95



INSIDE

- | | |
|--|-----------|
| Vice president's Message: | 3 |
| <i>What's New</i>
<i>Ann Howald</i> | |
| <i>Lepidium latifolium L.</i> | 4 |
| <i>in California</i>
<i>James Young and</i>
<i>Charles Turner</i> | |
| <i>A New Invasive?</i> | 5 |
| <i>Michael O'Brien</i> | |
| <i>Yellow Bush Lupine</i> | 6 |
| <i>Linda Miller</i> | |
| <i>Lupine Removal by</i> | 7 |
| <i>Heavy Equipment</i>
<i>Karen Theiss</i> | |
| <i>Musings of a Seed Sack</i> | 8 |
| <i>Reader</i>
<i>Dennis Isaacson</i> | |
| <i>Effects of Arundo donax</i> | 10 |
| <i>on Water Resources</i>
<i>Mark Iverson</i> | |

Lepidium latifolium L. - The massed flowers illustrate the origin of the common name, tall whitetop.

Photo by Jim Young

Who We Are

CalEPPC NEWS is published quarterly by the California Exotic Pest Plant Council, a non-profit organization. The objects of the organization are to:

- provide a focus for issues and concerns regarding exotic pest plants in California;
- facilitate communication and the exchange of information regarding all aspects of exotic pest plant control and management;
- provide a forum where all interested parties may participate in meetings and share in the benefits from the information generated by this council;
- promote public understanding regarding exotic pest plants and their control;
- serve as an advisory council regarding funding, research, management and control of exotic pest plants;
- facilitate action campaigns to monitor and control exotic pest plants in California; and
- review incipient and potential pest plant management problems and activities and provide relevant information to interested parties.

Newsletter Submissions

Letters to the Editor, notices, articles of all types, volunteer workday schedules, photographs and line drawings are welcome and may be submitted directly to the editor at the address below. We invite you to utilize *CalEPPC NEWS* as a forum for describing your project, asking for help, or bringing new issues or developments to the forefront. Electronic submission is gratefully accepted in PC-formatted 3.5" or 5.25" disks for WordPerfect or Microsoft Word, or ASCII text files. Please enclose a letter quality hard copy with your disk. Copy for the Spring 1995 issue is due with the editor by April 15, 1995.

Proceedings of *Arundo donax* Workshop

are now available for purchase. Please send a check or money order for \$15.00 for each copy, payable to Riverside County Park District. Mail to Paul Frandsen, P.O. Box 3507, Riverside, CA 92519-3507.

CalEPPC 1995 Officers and Board Members

Officers

President	Carla Bossard	St. Mary's College, Dept of Biology, P.O. Box 4057, Moraga, CA 94575, 916.758.1602
Vice president	Ann Howald	CA Dept of Fish & Game, P.O.Box 47, Yountville, CA 94599, 707.944.5529
Secretary	Mike Kelly	11875 River Rim Road, San Diego, CA 92126, 619.566.6489
Treasurer	Mike Pitcairn	CDFA, 3288 Meadowview Road, Sacramento, CA 95832, 916.262.2049
Past President	John Randall	TNC Exotic Species Program, 13501 Franklin Blvd, Galt, CA 95632, 916.684.6821

Board Members

	Greg Archbald	GGNPA, Fort Mason, Bldg. 201, 3rd Floor, San Francisco, CA 94123, 415.776.1607 EXT 230
	David Boyd	CA Parks & Rec., 1455-A E. Francisco Blvd., San Rafael, CA 94901-5557, 415.456.1286
Editor	Sally Davis	P.O. Box 1045, Cambria, CA 93428, 805.927.7187
	Nelroy Jackson	400 S. Ramona Ave., #212, Corona, CA 91719, 909.279.7787
	Jeff Lovich	NBS Palm Springs Field Station, P.O. Box 2000, No. Palm Springs, CA 92258-2000, 619.251.4823
	Charles Turner	800 Buchanan St., Albany, CA 94710, 510.559.5975

Working Group Chairpersons

CalEPPC newsletter	Sally Davis, 805.927.7187
Congressional O.T.A. study Database	Michael Parker, 510.792.0222 Steve Harris, 707.826.2709 e-Mail: Internet sharris@igc.apc.org
Federal Noxious Weed Act Membership	Michael Parker, 510.792.0222 Sally Davis, 805.927.7187
Nursery growers/landscape architects liaison	Daniel Songster, 714.895.8161
Press relations	Jake Sigg, 415.731.3028
Publications	Jake Sigg, 415.731.3028
Public officials seminars	Joel Trumbo, 916.355.0128
Slide collection	Tony Bomkamp, 714.837.0404
Species management and control:	
Arundo	Nelroy Jackson, 909.279.7787
French broom	Carla Bossard, 916.758.1602
German ivy and hoary cress	David Chipping, 805.528.0362
Pampas grass	Quentin Griffiths 415.669.7295
Yellow star-thistle	Mike Pitcairn, 916.262.2049
Tamarisk	Bill Neill, 714.577.2423 and Jeff Lovich, 619.251.4823
Weed Coordinator Task Force	John Randall, 916.684.6821

Vice president's Message

What's New

BY ANN HOWALD, VICE PRESIDENT

As we enter a new year, I want to welcome our new members and say thank you to **all** our members for supporting CalEPPC. Everyone on CalEPPC's board appreciates what each of you has contributed to our common goal of protecting California's magnificent wildlands from exotic pest plants.

First things first: You might be curious to know why this message is coming to you from your vice president, instead of from CalEPPC's new president, Carla Bossard. Although Carla is now on the mend, she was injured in a fall on the last day of a course she was teaching in Sumatra on tropical forest ecology. She underwent back surgery in mid-February and has begun a rehabilitation program. Her spirits are high and she is looking forward to assuming her duties as CalEPPC president as soon as she is able.

On February 18, 1995, CalEPPC member George Molnar hosted back-to-back meetings on two different, but related topics. Biocontrol of wildland weeds was discussed in the morning, followed by a discussion of the possibilities for cooperation between all of the state and regional EPPCs (California, Florida, Tennessee and the Pacific Northwest). The biocontrol discussion centered on developing a strategy for California and the Pacific Northwest to maintain adequate funding for biocontrol research and application. The need for such a strategy arises because President Clinton's proposed budget includes severe reductions in the USDA's biocontrol program which includes eliminating the Biocontrol of Weeds Lab in Albany, CA which has focused on star-thistle control in California and other western states. Dr. Ernest Delfosse, Director, USDA/APHIS, National Biological Control Institute, who attended the meeting, noted that federal support for biocontrol has been eroding since the 1960s in spite of major successes like the control of tansy ragwort (*Senecio jacobaea*). A decision was made to prepare an information packet for individuals and groups who want to request support for biocontrol from their legislators.

The discussion on how state and regional EPPCs could cooperate was viewed as preliminary, to be discussed at a later date, after input from our membership. Participants began by developing a set of goals and possible national actions that would be reviewed and commented upon by other state and regional EPPCs. One option has been presented to the CalEPPC board by Bob Doren, a founder of Florida EPPC; that of forming a new organization, a national EPPC, to promote national issues such as increased funding for research and control, new federal legislation, and development of educational materials. A formal national organization would require significant commitments of time and resources. A second option is for state and regional EPPCs to maintain close communication and cooperate informally on important issues, perhaps including an annual meeting with a few designated representatives to exchange viewpoints and discuss issues of national significance. CalEPPC's board wants to know what you think. Please send your comments about national cooperation to me or any other board member, or give one of us a call. (We're listed on page 2).

Looking ahead, our fourth annual meeting, CalEPPC Symposium '95, will be held the weekend of October 6-8 at the Asilomar Conference Center in Pacific Grove on the Monterey Peninsula. The program committee is planning an exciting array of speakers who will focus on wetland and riparian exotic weeds, the role of fire in weed ecology, and concurrent sessions on individual exotic weed species. The Asilomar Conference Center's rustic buildings, some of which were designed by famed architect Julia Morgan, are set in a native Monterey pine forest adjacent to restored coastal dunes that once were nearly overwhelmed by iceplant. Please mark your calendar and join us for another provocative and enlightening symposium! Registration materials will be mailed mid-spring.

Lepidium latifolium L. in California

BY JAMES A. YOUNG and CHARLES TURNER

Range Scientist and Botanist, USDA Agricultural Research Service
Reno, NV and Albany, CA

Perennial pepperweed (*Lepidium latifolium* L.) is a serious perennial weed that has been accidentally introduced to wetlands and riparian areas in California. It is a threat to the ecology of such areas because it is such a competitive species that it forms nearly mono-specific communities that greatly impact species diversity. The tangled, semi-woody aerial portion of this weed persist for several seasons, physically changing the nature of the infested area for such uses as waterfowl nesting habitat. The weed is a major threat to irrigated agriculture.

It is unfortunate that this weed is widely known by the common name, tall whitetop as another noxious weed member of the mustard family, *Cardaria draba* (L.) Desv., is recognized as whitetop. Because both species produce masses of white, mustard-like flowers, it is obvious where the similar names were derived. The Weed Science Society of America uses the common name perennial pepperweed for *Lepidium latifolium*, and hoarycross for *Cardaria draba*, but common usage is much too widespread to avoid confusion with the names. Adding to the confusion is the very diverse nature of whitetop, or hoarycross, where several distinct subspecies are recognized.



Description

California has about 15 native and 5 exotic species of *Lepidium*. Perennial pepperweed is a robust perennial that often occurs in massed colonies once it is well established.



Key causal identification characteristics are: 1) dense colonies of leafy stemmed plants occurring in circles from 3 to 6 feet in diameter; 2) massed leafy stems commonly from 2 to 3 feet in height, but occasionally to 6 feet; 3) masses of white mustard-like flowers; 4) masses of small, ovate, russet seed pods; and 5) masses of light tan stalks that weather a light gray, over-wintering into the next season.

Botanically, perennial pepperweed is distinguished by the upper cauline leaves not clasping the stem, the stigma exceeding the flower in length, erect stems, lack of tip on the fruit, white flower color, and the presence of vigorous rhizomes. Even botanical keys often refer to the occurrence of the weed in colonies. As with many successful weeds, perennial pepperweed is a phenotypically plastic species that, at least initially, appears as scattered diminutive leafy stems in meadows.

Habitat

Perennial pepperweed is very well adapted to soils with accumulations of soluble salts. It is not restricted to salty soils, and it has become established from coastal marshes to inland desert sinks. It does not survive prolonged flooding during the growing season, but can completely dominate wetlands, from the edge of standing water to quite dry upland areas. It is an occasional roadside species under very arid conditions.

Records of the California Department of Food and Agriculture indicate perennial pepperweed has been reported from all counties except Del Norte, Humboldt, and Imperial. It occurs in all western states except Arizona. In his classical paper on alien plants in California, Robbins suggested the weed was first introduced to Yolo County as an accidental contaminant of sugar beet seeds.

Control Measures

Perennial pepperweed is a very difficult species to suppress because of: 1) the nature of the habitats where it occurs; 2) the resistance of the species to herbicide applications; and 3) most importantly, the occurrence of creeping root stocks. Mechanical control measures often end in disaster because even very small root segments will produce vigorous new plants.

The Agricultural Research Service, USDA, is investigating the feasibility of mounting a biological control program for this pest. Both the Agricultural Research Service, USDA, and the Fish and Wildlife Service, USDI, have active research programs under way in cooperation with a broad spectrum of individuals and agencies interested in suppressing this pest. Funding for research programs for biological control and biological suppression technologies for exotic perennial weeds of wildlands is extremely limited. If you think it should be given a higher priority, contact Dr. Robert Reginato, Area Director, USDA, Agricultural Research Service, Pacific West Area, 800 Buchanan Street, Albany, CA 94710.

Sanitation

Perennial pepperweed still has a rather restricted distribution in California. The best control of this pest is to avoid infestation. Make sure seed sources are free of the pest, especially seeds of native plants from wetlands. Mechanical earth movers, especially track-laying equipment, are suspected as a major cause of spread of this weed. Clean soil from such equipment before it is transported.

VOLUNTEERS WANTED!!

Regional representatives are needed to serve on the CalEPPCNEWS Committee. The board is looking to the committee members to solicit articles on exotic pest plants or other items for publication (e.g., announcements, meetings, volunteer workdays, etc.), and to assist the editor in any manner deemed appropriate, including the willingness to assume the duties of guest editor on occasion.

Please write or call the editor, Sally Davis at P.O. Box 1045, Cambria, CA 93428, 805.927.7187.

A New Invasive?

BY MICHAEL O'BRIEN

L.A. City Planning Department

Since early 1993, I have watched some mysterious seedlings growing in the cracks of the stonework at the L.A. County Music Center. Although they looked like what I feared they were, only three occurrences do not a new trend make. Imagine my surprise, then, when I recently discovered a new seedling growing in the mortar joints of the granite facing on City Hall. No question then - I knew what it was. As if I needed further evidence, I later found a dozen seedlings growing in a recently renovated planting area a block away. The culprit? *Ficus rubiginosa* var. *australis*, known in the trade as "Ficus Florida."

Upon further exploration - imagine someone in a suit rummaging through planting areas in downtown L.A. - I came upon a vigorous colony of some five dozen seedlings of *Ficus microcarpa nitida* (complete with thrips), called *Ficus nitida* or sometimes *Ficus retusa* in the trade. You know this one as the ubiquitous street tree everywhere frost is not a problem.

Evidently, the wasp pollinator(s) of at least some species of *Ficus* arrived in the L.A. area, probably sometime in 1992. To date, I am familiar only with fig seedlings in the L.A. Civic Center area, although there is an unconfirmed report of a seedling in Pacific Palisades. And, so far, only these two taxa appear to be fertile, although we should watch out for *Ficus microcarpa*, *Ficus macrophylla*, *Ficus benjamina*, and *Ficus pumila*, the other four most common fig taxa in the L.A. area.

Checking with the National Biological Survey, I found that in Florida, both *Ficus microcarpa* and *Ficus benjamina* have recently become feral. There are not yet any reports of seedling figs from other states. In L.A., these fig seeds evidently need fairly constant moisture to germinate. The walls with seedlings stay damp most of the year, and the in-ground seedlings appear only in recently renovated, and hence, well-irrigated landscapes. Thus, arid Southern California should, on the whole, have no fear of being overrun with stranglers.

However, we should keep a watchful eye on our riparian areas. Although of small extent, they are of great importance to the native biota. Since the small figs are eaten and carried by birds, even areas far from exotic vegetation may not be safe from the genus *Ficus*.

For more information, or to report suspected fig seedlings, contact Michael O'Brien at 213.485.3864.

Yellow Bush Lupine

BY LINDA MILLER

Restoration Manager, TNC Lanphere-Christensen Dunes Preserve
(Reprinted from *Dunesberry: Friends of the Dunes*, Vol XIII No. 4, Winter 1994)

Yellow bush lupine (*Lupinus arboreus*), also known as bush lupine or tree lupine, is a big, beautiful shrub with fragrant yellow flowers. This lovely plant from the legume family also happens to be one of the greatest threats to native dune plants in Humboldt County. Although lupine is native to California, probably from the Sacramento River and Bay Area south, it is not native to Humboldt County.

Lupine was introduced to the North Spit in 1908 to stabilize shifting sands and to protect the fog signal station (near the present Coast Guard Station) from sand burial and damage. Seeds were collected from the Presidio in San Francisco and planted near the signal station.

In 1917, the U.S. Army Corps of Engineers were repairing the jetty, hauling rocks by train from a quarry in Trinidad. Five women were hired by the Corps to spread lupine seed along the railway to stabilize the sand and keep it from covering the tracks. By that year, lupine plants were well established at the fog signal station where the women collected seeds.

Lupine was subsequently planted at Clam Beach to stabilize the sand dunes, and has since spread aggressively throughout the sand dunes of Humboldt County. Based on historical aerial photographs, the extent of lupine on the North Spit was estimated to be 244 acres in 1939, which increased to 531 acres by 1984. This represents a rate of spread of 6.4 acres per year. Recent aerial photographs of unrestored North Spit dunes indicate that there was a significant increase in bush lupine between 1988 and 1994.

What makes lupine such a successful invader and undesirable plant on the dunes of Humboldt Bay? Lupine is very well adapted to the harsh dune environment. The large shrub possesses a stout tap root which reaches down deep to obtain moisture in an otherwise dry environment. The roots have nodules which house nitrogen-fixing bacteria. These bacteria convert unusable atmospheric nitrogen to a form which is usable by the plant. This symbiotic relationship between bacteria and plant gives the lupine a significant advantage over many native dune plants which are otherwise adapted to low nitrogen levels.

Once lupine become established on the dunes, it changes the environment to one which is more hospitable to other plants - including other non-natives. This large shrub creates a new microclimate by providing shade and moisture in an otherwise exposed, arid environment. Studies conducted by

the Menzies' Wallflower Research Program have shown that other invaders, including exotic annual grasses and forbs (edible plants that are not grasses), encouraged by this new lupine "microclimate" are responsible for subsequent changes in soil chemistry. These annual grasses and forbs are often found growing at the base of well-established lupines, adding organic matter to the soil through decaying fibrous roots. The nitrate level is elevated in the soil due to accumulated duff and invading herbaceous plants. Ammonium salts are more likely to be present because of nitrogen-fixing bacteria on the mature lupine roots.

This new environment may be agreeable to weedy native plants and invasive non-natives, but the altered situation makes it difficult for many native dune plants to survive because of increased competition for resources. A great deal of native dune mat has been lost to this invasive lupine dune community, threatening the survival of endangered plants which depend on the dune mat for habitat. A study conducted by a local botanist in 1985 established that populations of Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekaense*) declined as a result of lupine encroachment. The wallflower, as well as beach layia (*Layia carnososa*), are federally listed as endangered species.

Restoration techniques for lupine-degraded dunes differ according to the level of invasion. These techniques were developed by The Nature Conservancy (TNC) under the Menzies' Wallflower Research Program. On dunes where lupine has recently invaded, removal of seedlings is adequate to restore the native dune mat as long as other invasive plants are not present. In areas where lupine has become established, and other invasive grasses and forbs are present, removal of mature bush lupine should be supplemented with removal of the duff layer, existing grasses and non-native forbs.

At the Lanphere-Christensen Dunes Preserve, lupines have been removed for 20 years on an annual basis at the Lupine Bash by loyal Friends of the Preserve and California Native Plant Society volunteers. Both volunteers and the Sheriff's Work Alternative Program (SWAP) participants have been removing lupine from Manila Beach and Lanphere-Christensen Dunes Preserve annually since 1992.

The duff removal treatment was conducted on an experimental scale in the Fall of 1994 through a cost-share agreement between The Nature Conservancy and the Bureau of Land Management (BLM). This technique was applied at the BLM Endangered Plant Protection Area at the Samoa Dunes National Recreation Area.

Lupine Removal by Heavy Equipment

BY KAREN THEISS

Karen Theiss and Associates, McKinleyville, CA

(Reprinted from *Dunesberry: Friends of the Dunes*, Vol XIII No. 4, Winter 1994)

Yellow bush lupine (*Lupinus arboreus*), an aggressive, introduced species, has invaded much of the north coastal dunes, outcompeting native dune mat species. Lupine has stabilized some areas so thoroughly that they no longer provide suitable habitat for native species.

Labor-intensive manual removal has been the primary management technique used to control bush lupine. In 1990, a project was initiated to determine whether heavy equipment could provide a more cost-effective alternative in heavily infested areas. The project compared different methods of removal, ease of access and operation, labor requirements, debris generation, and debris handling.

The secondary goal was to monitor the recruitment of lupine, as well as native and exotic plants, in subplots within each treatment plot. The experiment was undertaken at the 80-acre Eureka Dunes Protected Area owned by the City of Eureka and managed by The Nature Conservancy (TNC).

Funding was provided by a The Nature Conservancy and a Federal Coastal Resources Energy Assistance Grant to the Natural Resources Division of the Humboldt County Department of Public Works.

Seven test plots were set up in the westerly portion of the Eureka Dunes Protected Area. Baseline data was gathered before lupine removal. The test plots were subjected to the following treatments:

- Removal of vegetation by brush rake attached to a crawler;
- Removal of vegetation by brush rake attached to a crawler, and subsequent removal of the duff layer by plough blade or bucket;
- Removal of only lupine by chokers attached to a bucket on a rubber-tired loader;
- Control plots

Two different brush rakes were tested. Three-inch tine spacing was more effective than seven-inch tine spacing because shrubs of differing sizes could be removed simultaneously. A plough blade was more efficient in the removal and sidestepping of the duff layer than was a bucket.

Removal of lupine by the use of chokers was the most time-consuming method tested, and was least disruptive to the substrate. The crawler was more maneuverable than the loader for all clearing operations other than choker pull; both pieces of equipment were **very disruptive** to the substrate because of the number of passes required to remove vegetation.

Following treatment, each test plot was subdivided into 18 subplots for the purpose of monitoring plant recruitment.

One-third of the subplots received no secondary treatment (control), one-third were covered with weed mat for one year following equipment treatment, and one-third were covered with weed mat for two years following equipment treatment. Monitoring of vegetation was conducted semi-annually from 1990 through 1993. No further weeding was conducted on any of the subplots.

Use of the seven-inch tine brush rake followed by duff removal with a plough blade had the lowest lupine recruitment following treatment, while the choker pull had the highest lupine recruitment. The use of weed mat following treatment was very effective in suppressing lupine establishment in all treatment plots. The brush rake and plough blade treatment showed very low lupine recruitment, regardless of secondary treatment. Monitoring data indicate that the brush rake and plough blade treatment has the highest potential for natural colonization by native dune mat species.

The establishment of native and exotic species was quite variable among the treatment plots, and in some cases was influenced by neighboring invasive vegetation, specifically dune tansy (*Tanacetum camphoratum*) and iceplant (*Carpobrotus edulis*).

The results of this study demonstrate that restoration of lupine-dominated coastal dunes can be efficiently and economically accomplished by the use of heavy equipment. Equipment should only be used in heavily infested areas due to the amount of disturbance to vegetation. The combined use of a closely-spaced brush rake followed by removal of the top six inches of duff/seed bank with a plough blade is effective in dramatically reducing lupine recruitment and in providing a suitable habitat for colonization of native mat species.

Colonization potential would be enhanced by weeding of invasive and/or undesirable species during the first year or two after treatment. Education of all personnel involved as to the goals of the restoration project is critical to its success.

Yellow bush lupine (*Lupinus arboreus*)
Member of the Legume Family (Fabaceae)
Native Range - Sonoma County to Ventura
County, naturalized further; Habitat - dunes,
coastal bluffs, and scrub lands; Height - 2 to
9 feet; Flowers - March to June, yellow,
sweet smelling, pea flowers

Musings of a Seed Sack Reader

BY DENNIS ISAACSON

Field Operations Manager for the Commodity Inspection Division, Oregon Dept. of Agriculture
(Reprinted from Summer 1994 *PNW-EPPC Newsletter*)

Exotic pest plant species are unintentionally spread in many ways, but one of the most common means of their introduction into new areas is as contaminants in seed. If we want to insure that when we buy and use seed we're not providing exotics an avenue into new areas, we need to insure that the seed we use is of high quality, free of unwanted hitchhiking species.

So what can we do to prevent our use of seed being the source of unwanted species? What are some of the keys to getting good seed that meets our needs? There aren't any quick and simple answers to questions like these, but there are a few guidelines which could help. Among these are:

- Any seed used should be tested for quality
- Familiarity with some fundamental elements of state and federal laws covering sales of seed is helpful (if not fun!)
- **Purchase in advance**, if possible
- Be very careful when buying **small quantities or uncommon types of seed**.

Seed Quality

There are two primary determinants of seed quality: **purity and germination**. Tests for each of these quality factors are routinely conducted. With exotic pest plant species, we are concerned mainly with **purity**. There is a lot of stuff in any seed lot that is not the seed of the species being tested. Chaff, dirt, and smut balls are examples of materials called "inert matter." Seed of "other crops" may be found in test samples, as might "weed seed." Each of these categories are calculated as percentages of the lot and are reported on a label attached to each container (usually bags). There are special requirements related to weed seed, and noxious weed seeds must be identified. There are two points about tests for quality that potential buyers should keep in mind: 1) **testing must be done to provide information included on labels, and labels are to be attached to each container; and 2) it is not unreasonable to require testing prior to use of the seed.**

Depending upon where the seed under consideration for use has been produced, a purchaser might be wise to request a (purity) test specifying "All States Noxious Weed." Seed technologists then sort test samples looking for, and identifying, any species of weed on noxious weed seed lists of any of the states in the U.S.

Bottom Line: The main aspect of seed quality we're

concerned with in making sure that we don't bring in unwanted invaders is purity, and we read the label and request tests if we are concerned about the origin of the seed.

A practical purity example: this past year there was an abundance of foreign-grown wheatgrass seed on the market. This seed sold at a discount of about 20% off the price of domestically-produced wheatgrass. Some very ugly weeds grow in the countries where this seed was produced, and requesting a test for such a lot **would not only be reasonable, but necessary.**

Laws

If there were but one thing to know about state and federal seed laws, it would be that each container of seed shall bear a label that has a lot of information on it. Of course, as with any law or regulation, there are lots of caveats, whereases, and exceptions, but as a general rule, your seed is supposed to have a label on it (even if it is lawn mix from K-Mart!). The information on the label can make you an informed purchaser of seed. The label will indicate the kind and variety of seed in the container; where it was grown; what is its identifying lot number; the percentage by weight of other crop seed, inert matter, and weed seed; the **kind and number per pound of noxious weed seed**; the germination percentage; name and address of the seller; ..and so on. You get the idea. **If there is no label, don't accept the seed.**

Bottom Line: Lots of us read the labels on grocery food items. There is no reason we shouldn't do so on seed sacks, too.

Purchase in Advance

If I'm going to re-seed my lawn, I'll probably wait until the last minute to head off to my favorite discount retailer to get the seed I want. Since I live in the Willamette Valley, there's a very good chance that what I buy will have been produced in my backyard, so to speak, because the Willamette Valley is where most of the lawn seed sold in this area originates. The species of exotic pest plants that might be in the container(s) I buy probably are not going to be much different from those that are already in my yard.

This is not necessarily so if I'm to seed a roadside, a burn, a rehabilitation project, or an erosion control project.

In these situations, I will be shopping for non-lawn varieties that are not produced anywhere near where they are to be used. I might be offered seed from Israel, Canada, Montana, or Argentina. If I'm to buy something from someplace that might be likened to weed heaven, I want to have time to test the seed before I use it. And I want to have time to return the seed, and purchase and test another lot in case what I received the first time doesn't meet my expectations. I can't do this unless I purchase in advance.

Small Quantities and Uncommon Types

Seed is purchased from dealers who make a living selling lots of seed (pun intended). Seed lots are big - some as large as 55,000 pounds. Dealers don't make a living on two-bag sales. Two-bag buyers tend not to form lasting relationships with their dealers. Customer service and customer loyalty just don't figure into this picture. There may not be much one can do about this, but it does seem as if pooling purchases with other units could be considered. If you know of other seed users, it would be wise to try to pool purchases. You may be able to find a better price, and the service on a larger order shouldn't be any worse than what you'd expect on a small order.

Uncommon types of seed can have a greater potential to be a source of unwanted plant pest introductions than common ones. A broker/dealer may have to shop around a long time to find a source of uncommon seed types, and finding a source can become secondary to concerns about quality. As an example, suppose for some reason we specify that we want to buy certified Agram Chewings fescue for a seeding job. In 1993, there was no reported certified production for Agram in the U.S. As a dealer, then, I would start looking for Agram of any year of production, and production from anywhere. By specifying Agram Chewings fescue, I could be putting a dealer through a lot of work finding inferior production just to fill my order - and finding it might be more important than its quality. While Agram may have desirable characteristics, there are more than 30 available varieties of Chewings fescue, and it may be best to specify options for several varieties.

Read the Seed Sacks

Naive buyers, in a big hurry to buy small amounts of seed, could be considered as potential dispersal agents for exotic pest plant species. Knowing about seed quality and seed laws, arranging purchases well in advance, and buying in larger amounts are some of the things we can do to reduce the chances of introducing unwanted invaders.

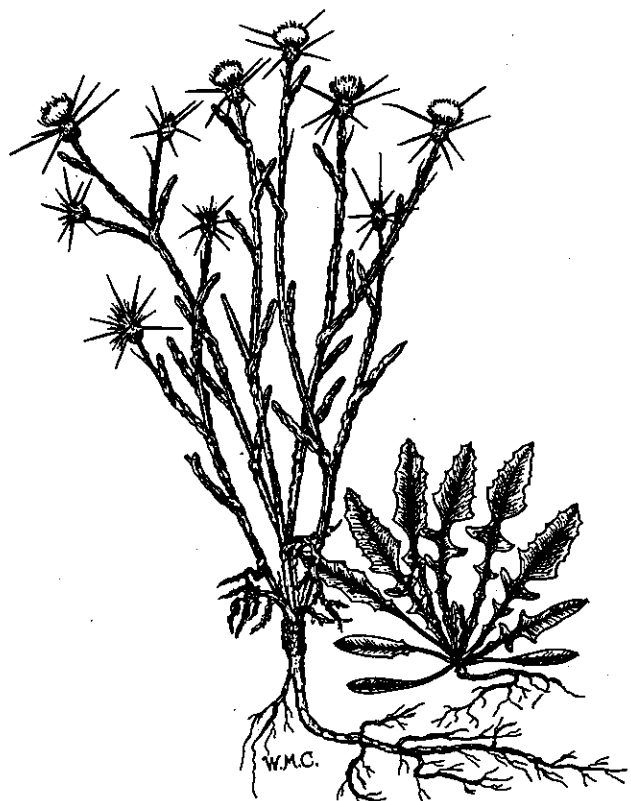


A New and Timely Publication from the BLM: *Noxious Weed Strategy for Oregon/Washington*

The Bureau of Land Management in Oregon and Washington has released a *Noxious Weed Strategy for Oregon/Washington* which provides direction and a framework for implementing a noxious weed management program. The strategy explains the scope and resource impacts of noxious weeds and proposes a course of action to deal with the situation on BLM administered lands in Oregon and Washington.

The purpose of the strategy is to facilitate restoration and maintenance of desirable plant communities and healthy ecosystems. Several goals and recommendations are presented to conduct an effective integrated noxious weed management program.

Individuals who would like to receive a copy of the document may write Bob Bolton, USDI Bureau of Land Management Lakeview Office, P.O. Box 151, Lakeview, OR 97630, or you may call him at 503.947.6161.



Effects of *Arundo donax* on Water Resources

BY MARK E. IVERSON

City of Riverside Water Reclamation Plant

(Reprinted from *Arundo donax Proceedings*, November 1993)

Standing on the banks above the Santa Ana River, looking across a sea of *Arundo donax*, it is easy to understand how arundo effects the riparian habitat of the river. The thick, high-growing cane chokes out all other plant life. The growth is so dense that neither man nor small animal can pass through. And anyone who has seen television coverage, or witnessed first-hand burning of arundo understands the danger it presents to people and animals who live near the river. But what is not as easy to understand is how arundo effects water resources.

Every year, arundo growing along the Santa Ana River evaporates an estimated 56,200 acre-feet of water - enough water to serve a population of about 280,000 people. If this amount of untreated water was purchased from the Metropolitan Water District (MWD), it would cost approximately \$18,000,000 at the current cost for untreated drinking water. There is, therefore, a cost that can be easily associated with arundo and its effects on water resources. A successful arundo removal program could ultimately cut the evapotranspiration by two-thirds. This would save an estimated 37,500 acre-feet per year of water, worth approximately \$12,000,000.

Effects on the Quantity of Water Resources

Arundo is a non-native plant that was imported to Southern California from the Mediterranean by the early Spanish settlers. Over the years, the arundo population has increased to the point where it out competes all other native plant species in riparian habitats. You can visit almost any stream or river in southern or northern California and find arundo growing in abundance. This is particularly true along the Santa Ana River.

Not only does arundo out compete native plants, it uses about three times as much water as they do. There are no specific studies on the evapotranspiration rates of arundo. Horticulture experts, however, estimate arundo evaporates water at approximately the same rate as rice. This means that every acre of arundo uses about 5.62 acre-feet of water per year. Native species use only about two-thirds this amount; 1.87 acre-feet per year. The water lost to evapotranspiration is water that would otherwise be available for groundwater recharge, and ultimately drinking water supplies.

The Santa Ana River, and the other streams and rivers in Southern California, are natural groundwater recharge basins. Water in the rivers migrate down through the river beds and into the groundwater aquifers. Were it not for the numerous wastewater discharges along the Santa Ana River, it would be almost, if not completely, dry except during the short rainy season. Only a small portion of the runoff from the heavy winter rains reaches the groundwater aquifers. Most of it runs off quickly and is ultimately discharged to the ocean. But nearly all of the water that flows in the river during the dry season

either percolates into the groundwater or is lost to evaporation.

There are an estimated 10,000 acres of arundo along the Santa Ana River. Using the estimated evapotranspiration rate of 5.62 acre-feet per acre per year, a total of 56,200 acre-feet of water per year is being consumed by the arundo. If the arundo was completely replaced with native vegetation, the annual water consumption of the plants would be only about 18,700 acre-feet per year. To put this in perspective of beneficial use, one acre-foot of water is enough to serve a family of five for one year. The savings in water consumption would therefore be enough to serve a population of around 190,000 people. The water saved by reducing evapotranspiration will naturally recharge the groundwater aquifers and be available for drinking water supplies.

Effects on the Quality of Water Resources

Being a giant reed grass, arundo provides little shade along the banks of the river. Native vegetation normally overhangs the river, providing shade that keeps the temperature of the water down. Arundo provides no significant amount of shade; consequently, the water in the river is exposed to more sunlight. This increases the water temperature and changes the chemistry of the water.

With increased sunlight comes increased photosynthesis activity. Warmer water in conjunction with more sunlight promotes algae growth which tends to raise the pH of the water. The Santa Ana River, being a wastewater effluent dominated stream, is high in ammonia nitrogen concentration. The high pH of the water shifts the equilibrium of ammonia from the ionized to the un-ionized form. un-ionized ammonia is more toxic to fish and other aquatic life. The increase in algae growth also reduces the clarity of the water. Arundo therefore degrades the quality of water resources as well as the quantity.

While it is easy to attach a dollar amount to show the effects of arundo on the **quantity** of water resources, it is more difficult to do so for how it effects the **quality** of water resources. The net result is water quality that is less suited for fish and other aquatic life. Arundo, therefore affects the water resources of the Santa Ana River in ways that are both tangible and intangible to man.

People benefit either directly or indirectly from a healthy river habitat. Those people who fish, swim, and otherwise visit the river for recreation benefit directly from better water quality. But those who don't visit the river are also affected. How and to what monetary extent is difficult to determine. Suffice it to say that ultimately, we are all affected by our natural environment, and water resources are a key factor in environmental quality. Removal of arundo is therefore important from the standpoint of both the quality and quantity of water resources.



CONTRIBUTING MEMBERS

CalEPPC is pleased to recognize contributions for 1995 of \$100 or more from our private and corporate sponsors. Thank you for your generous sponsorship.

EBC Company
 Esalen Institute
 Jones & Stokes Associates, Inc.
 Monsanto Company
 Redwood National Park
 San Simeon District, CA Department of Parks & Recreation
 Tree of Life Nursery
 UCSD Campus Planning
 WESCO

Our membership continues to grow!
 CalEPPC warmly welcomes the following people who joined November through February:

Dr. Ellen Bauder
 Sally Bianco
 Brian Cashore
 Karen Clahassey
 Roger W. Cook
 P. Terry Gaughen
 Stewart B. Hanna
 Dr. Michael Josselyn

Steve Junak
 Marilyn Machi
 Eric McGuire
 Nicole Nedeff
 Lynne Dee Oyler
 Rich Records
 Randall Rich
 Willie Walker

1995 CalEPPC Membership Form

Join CalEPPC Today!

	Individual	Institutional
<input type="checkbox"/> Student/Retired	\$ 15	
<input type="checkbox"/> Regular	25	\$ 100
<input type="checkbox"/> Contributing	50	250
<input type="checkbox"/> Sustaining	250	1,000
<input type="checkbox"/> Lifetime	1,000	
<input type="checkbox"/> Other Gift	\$ _____	

Please make check payable to: CalEPPC.

Mail your membership application form and check to:

CalEPPC Membership
 c/o Sally Davis
 P.O. Box 1045
 Cambria, CA 93428-1045

If you would like to join CalEPPC, please remit your calendar year dues using the form provided below. All members will receive the CalEPPC newsletter, be eligible to join CalEPPC working groups, be invited to the annual meeting, and participate in selecting future board members. Your personal involvement and financial support are the key to success. Additional contributions by present members are welcomed!

Name _____
 Organization _____
 Address _____
 City, State, Zip _____
 Office Phone _____
 Home Phone _____
 FAX _____

Upcoming Meetings

- **MARCH 9, 1995, SACRAMENTO, CA**

California Biological Pest Control Conference will be held Thursday, March 9, 1995 at the Beverly Garland Hotel, 1780 Tribute Road, Sacramento, CA. For information please call: Anna Anderson or Dave Wilson at 916.741.7500.

- **MARCH 13-16, 1995, SACRAMENTO, CA**

The Western Society of Weed Science (WSWS) will be held at the Red Lion Inn, Sacramento, CA. For information, contact Wanda Graves, 510.790.1252

- **MARCH 16-17, 1995, SACRAMENTO, CA**

The Western Aquatic Plant Management Society will meet at the Red Lion Inn, Sacramento. Contact Nate Dechoretz at 916.654.0768 for more information.

- **APRIL 17-21, 1995 (EARTH WEEK), PORTLAND, OR**

Eighth Conference on Research and Resource Management in Parks and on Public Lands will be held in Portland, Oregon.. This premier interdisciplinary conference on protected lands will focus on the theme, *Sustainable Society and Protected Areas, Challenges and Issues for the Perpetuation of Cultural and Natural Resources*. To register, contact The George Wright Society at P.O. Box 65, Hancock MI 49930-0065, FAX 906.487.9405.

- **APRIL 24-27, 1995, BOZEMAN, MT**

The Western Society of Weed Science will hold its *Noxious Weed Management Short Course* in Bozemen, Montana. Please contact Celestine Duncan, 406.443.1469. The course will cover weed identification, biological control methods, herbicides, computer use in weed science, noxious weed management on range and pasture, weed inventories and planning, safe handling of pesticides, and use of application equipment.

- **OCTOBER 6-8, 1995, PACIFIC GROVE, CA**

Reserve Columbus Day weekend for CalEPPCs annual conference. By popular demand, the California Exotic Pest Plant Council will hold *CalEPPC Symposium '95* at the Asilomar Conference Center in Pacific Grove, California. Registration material will be mailed in May.

California Exotic Pest Plant Council

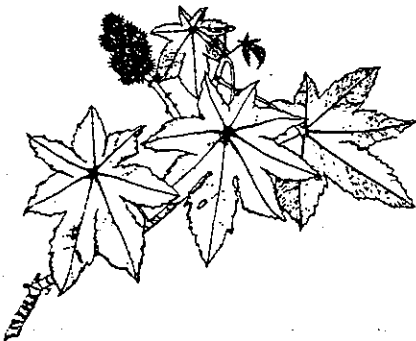
CalEPPCNEWS

P.O. Box 1045

Cambria, CA 93428-1045

NONPROFIT ORG. U.S. POSTAGE PAID CAMBRIA, CA PERMIT NO. 89
--

FORWARDING AND RETURN POSTAGE GUARANTEED
ADDRESS CORRECTION REQUESTED



TIME-DATED MATERIAL



PRINTED ON RECYCLED PAPER