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CONTACT: Janet Byron, (510) 987-0668, janet.byron@ucop.edu

Editors: High-resolution images are available.

# April-June 2006 *California Agriculture magazine*

## Yellow starthistle marches across 14 million acres of California

Yellow starthistle has invaded more than 14.3 million of California's 101 million acres, making it by far the fastest-spreading and most-invasive nonnative plant the state has ever seen, according to a peer-reviewed study published in the April-June 2006 issue of the University of Californias *California Agriculture* journal.

Now commonly found in rangelands and along roadsides statewide, yellow starthistle -- native to southern Europe and northern Africa -- grows in bushy patches and has 1-inch-long spines emanating from its flower heads, which irritate hikers and discourage grazing animals. It is also poisonous to horses, and can harm the local landscape and ecology.

"Once this weed gains a foothold, it can build up dense populations that displace native and other desirable vegetation," wrote Michael Pitcairn, lead author of the study and a scientist with joint appointments at the California Department of Food and Agriculture and the UC Davis department of plant sciences.

Pitcairn and his colleagues conducted a township study in 2002, the first comprehensive statewide survey of yellow starthistle since 1985, when California's gross yellow starthistle acreage was an estimated 7.9 million acres. **The full article, and the entire April-June 2006 issue of *California Agriculture*, is posted online at http://californiaagriculture.ucop.edu.**

The article includes a county-by-county table of yellow starthistle infestation levels. In 2002, Monterey County had the largest gross acreage (1.65 million acres), followed by Siskiyou and Mendocino counties (about 1 million acres each) and Fresno County (925,000 acres). The largest proportional increase in infestation occurred in Ventura County, which went from 5 acres in 1985 to 250,000 acres in 2002.

When evaluated by region, the Sacramento Valley had the largest gross acreage of yellow starthistle with more than 5.8 million acres, followed by the San Joaquin Valley (3 million acres), the North Coast (2.8 million acres) and the Central Coast (2.3 million acres). These four regions account for 98 percent of the total gross acreage of yellow starthistle in California. The far northeast corner of California and southeast coast and interior regions still remain largely unaffected, although limited starthistle infestations do occur in these regions.

"It is not certain how far east and southeast yellow starthistle will spread in the future because the environmental factors that limit its distribution (such as low annual rainfall) are not yet known," the authors wrote. "However, we anticipate yellow starthistle continuing to increase its

density and distribution in both Northern and Southern California, with the highest rates of increase in the southern coastal counties."

The first record of yellow starthistle in California was made in Oakland in 1869, and it was subsequently introduced many times as a contaminant of alfalfa seed. Using herbaria records and a comprehensive literature review, the authors map out the weed's spread throughout the state over the past 135 years. It increased slowly through 1960, but then exploded in numbers, invading an average of 335,000 acres per year.

"Since 1960, the rate of spread of yellow starthistle has been steady, almost linear, and there is no indication of it slowing down," the authors wrote.

Management programs for yellow starthistle are in place regionally and locally, and a biological control agent has been released in numerous locations around California. The authors urge land managers to eradicate new infestations when they are "small and easy to control." **Contact:** Michael Pitcairn, (916) 262-2049, mjpitcairn@ucdavis.edu.

**Note to editors:** California Invasive Weeds Awareness Week is July 17-23, 2006; for more information, go to the California Invasive Plant Council Web site at www.cal-ipc.org.

Also in the April-June 2006 issue of *California Agriculture*:

**Bat houses:** An 8-year study evaluated the occupancy rates of 186 bat houses installed in rural areas around California's Central Valley. Colonies of bats preferred houses mounted on structures such as buildings, with shade or morning sun only, within one-quarter mile of water. **Contact:** Rachael Long, (530) 666-8734, rflong@ucdavis.edu.

**Tomato water use:** Processing tomato yields have increased 53 percent during the past 35 years, but critical data concerning crop water use has not been evaluated since the 1970s. A 4-year study of water use by processing tomatoes, conducted from 2001 to 2004 in the Central Valley, provides important information that growers can use to schedule more-efficient crop irrigation. **Contact:** Blaine Hanson, (530) 752-4639, brhanson@ucdavis.edu.

**Boron deficiency in grapes:** Boron deficiency can reduce grape yields in certain areas of California. Foliar boron applied to vines at the right time during the fall was an effective treatment. **Contact:** Peter Christensen, (559) 449-8220, CHRISTEN@uckac.edu.

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