News From the Aquatic Weed Front

A slimy green alien weed is clogging waterways and boat propellers. A nuisance to boating enthusiasts, it's a real threat to California's irrigation water delivery systems. If the weed continues growing unchecked, it could substantially impede waterflow to farms and cities.

"*Egeria densa* is an aquatic weed from Brazil that was probably dumped unthinkingly into the Sacramento River by a fish tank owner who tired of the hobby," says Lars W. J. Anderson. He is an ARS plant physiologist who has studied *Egeria* for the past 2 years.

"The weed has been in the Sacramento Delta for perhaps 30 years, but it only recently became a problem."

Trouble started when the prolonged drought of 1987-94 reduced flow in the river. The water moved more slowly and carried less silt, compared to more normal years when larger amounts of swiftly flowing water kept sediment suspended.

Shallower, more slowly moving water heats up more quickly in the spring and stays warmer later in the fall. And with less suspended sediment, aquatic weeds get additional sunlight that penetrates to the deeper areas.

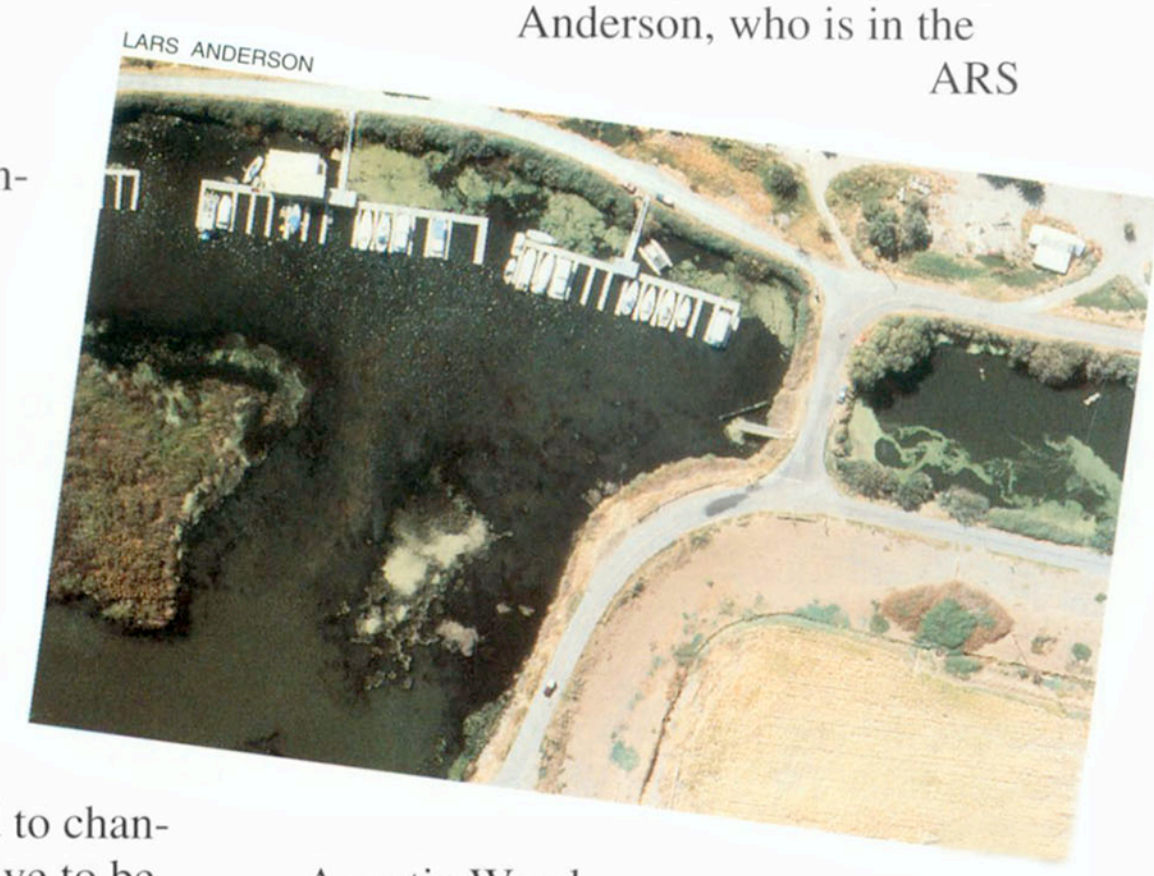
Egeria can double in size every 4 or 5 weeks during hot summer months. It roots in channel bottoms, and its long stems collect sediment, further slowing waterflow.

Because *Egeria* grows from roots attached to channel bottoms, herbicides have to be placed in the water. Other aquatic weeds, such as water hyacinth, live on the surface and can be controlled by foliar herbicide sprays.

The weed has so far established itself in several sloughs southwest of Sacramento and is spreading into other waterways.

"Some waterways are so clogged with *Egeria* that they look more like golf courses and are ruined for boating, swimming, or fishing," says Anderson, who is in the ARS Aquatic Weed Control Research Unit at Davis, California. "Waterfront homeowners especially worry about their property values."

LARS ANDERSON



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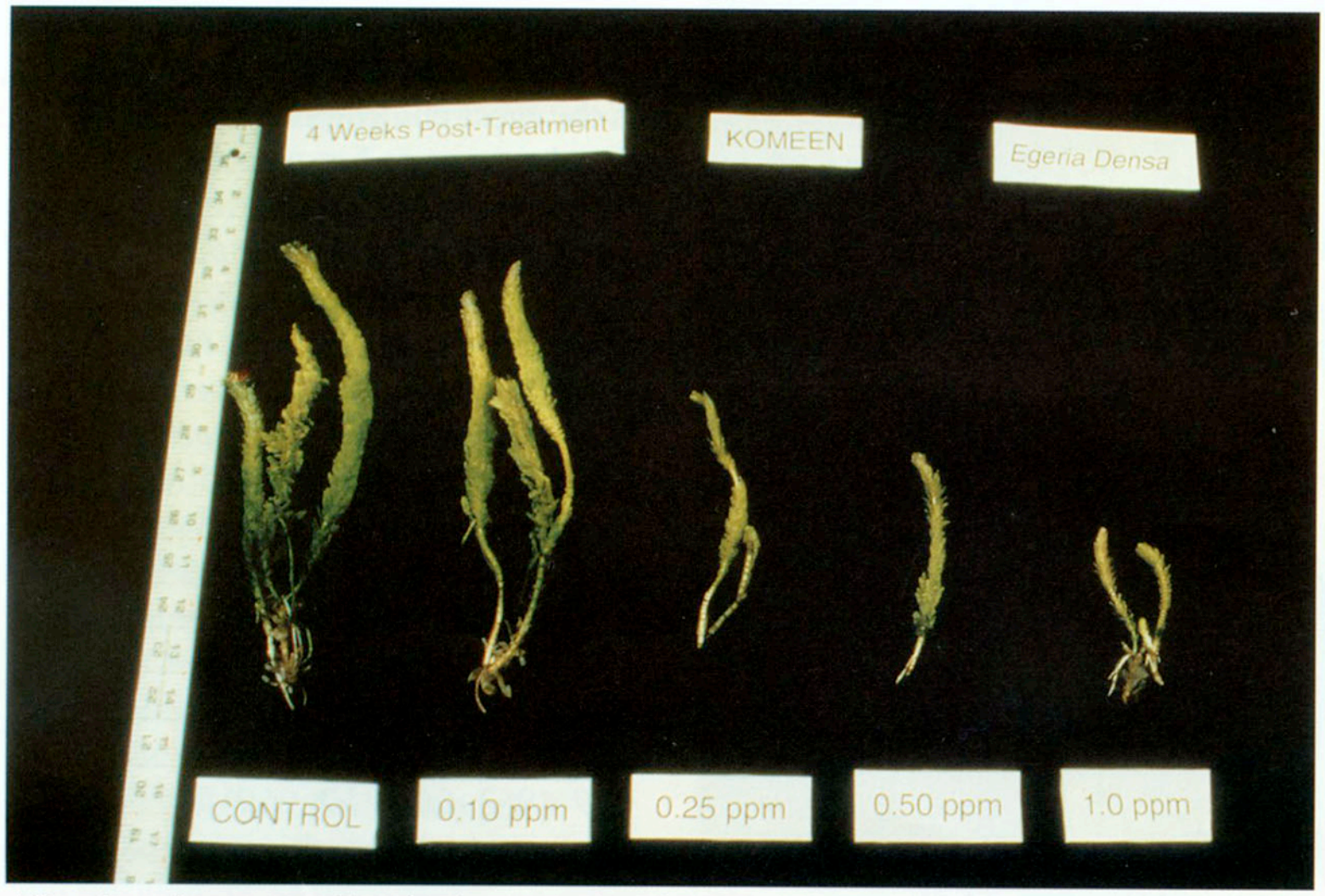

After 4 weeks, mature *Egeria* plants exposed for 7 days to varying concentrations of copper from the aquatic herbicide Komeen showed stunted growth and fewer roots.

LARS ANDERSON

***Egeria* from aquatic cultures maintained by ARS researchers at Davis, California.**

But cutting, harvesting, or dredging are futile attempts at control.

Now Anderson has successfully subdued *Egeria* on a 5-acre area in a delta slough with a commercially registered aquatic herbicide known as Komeen. This contact herbicide defoliates the weed, usually down to its roots. It contains copper bound to an organic chelate that makes the copper more accessible to the weed and less toxic to algae.

Approved by both federal and state environmental regulators, Komeen doesn't harm fish and other native aquatic life, but it does suppress two or three alien weed species, along with *Egeria*.

Unfortunately, underground rhizomes are unaffected by only one Komeen application, and the plant can grow back within a few weeks. So the herbicide would have to be applied at 3- to 5-week intervals throughout *Egeria's* growing season, from mid to late April until the end of September.

Anderson estimates it would cost several hundred thousand dollars to control current infestations by applying the herbicide with power boats. He hopes to cut costs in half by using tides to spread the herbicide at amounts required by the label.

Ocean tides at the Golden Gate near San Francisco affect waterflow 50 miles inland. If scientists can figure out when and where to place the herbicide in the complex web of waterways that make up the delta, it might be possible to harness the tides and use them—rather than boats—to distribute the herbicide.

"At some sites, we might run injector lines across a slough and release the chemical at the end of low tide. The following high tide would push water back into the weed-infested area—like filling a trough—and hold it there for several hours," says Anderson.

He also hopes to test Sonar, a systemic organic herbicide that has proven successful in other states. It is absorbed by aquatic weeds and prevents growth by interfering with the synthesis of pigments that protect chlorophyll.

Sonar is usually applied at lower rates—10 to 60 parts per billion, compared to about 500 for Komeen. And Sonar might control *Egeria* with only a treatment or two per year.—By **Dennis Senft,** ARS.

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LARS ANDERSON

Aerial view of Sandmound Slough in the Sacramento (California) Delta shows dark areas of *Egeria* in the water.

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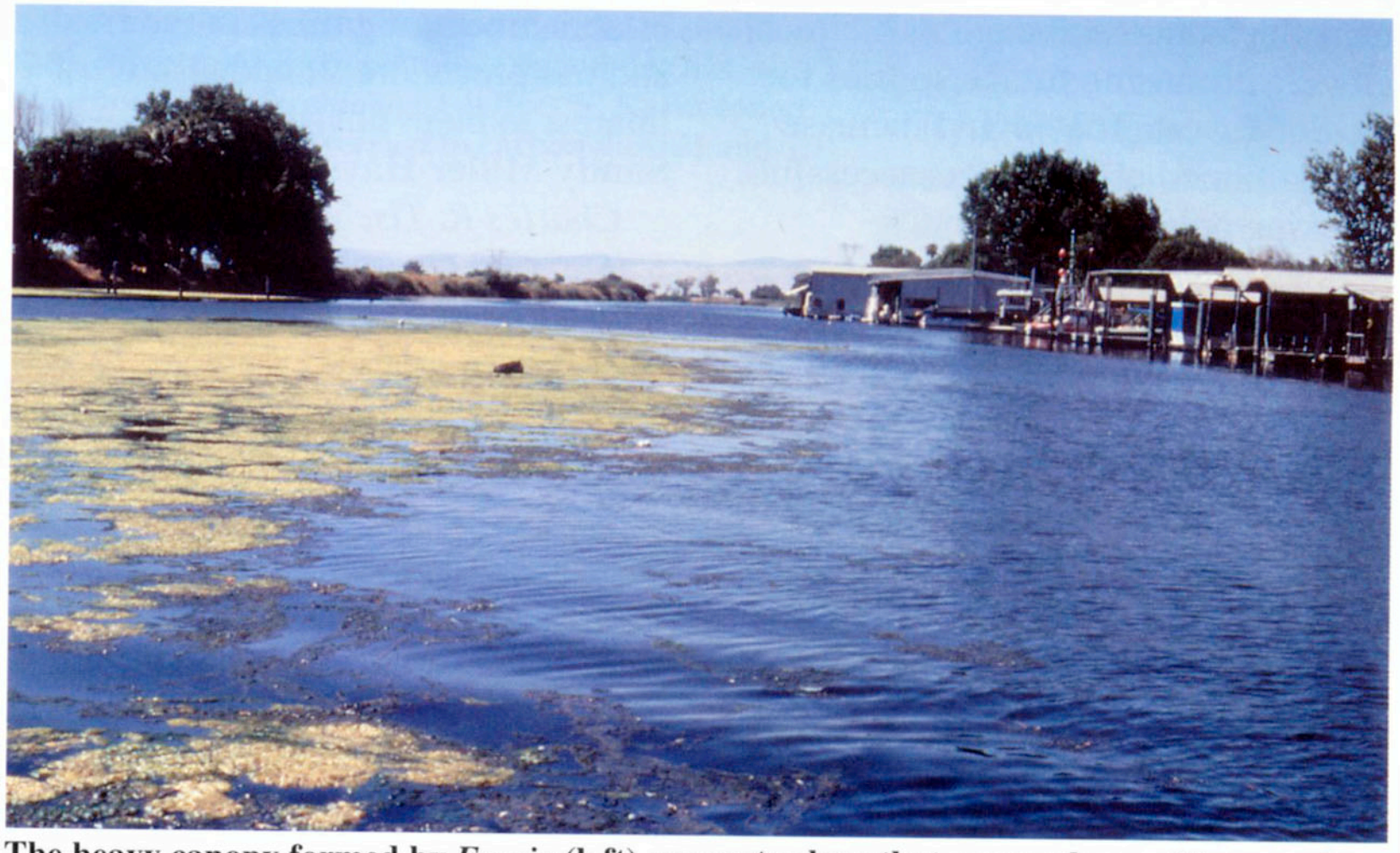

The heavy canopy formed by *Egeria* (left) supports algae that cause odor problems and interfere with waterfowl use of infested areas.