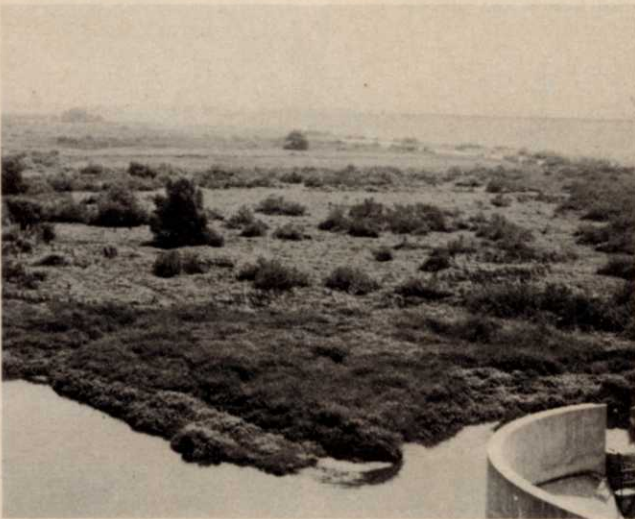
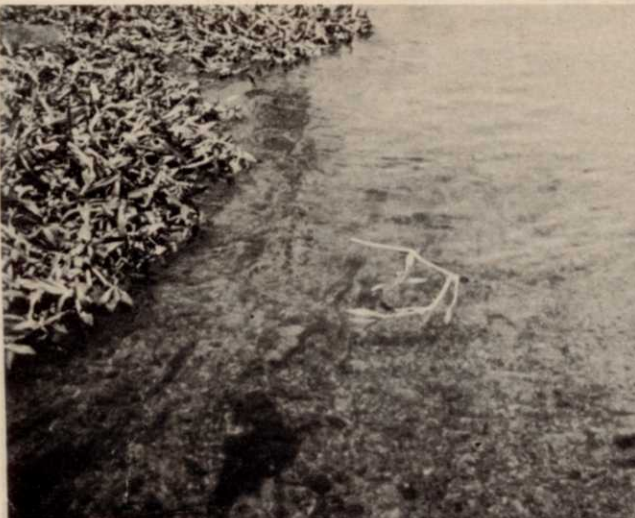




Alligatorweed not only choked the waterways but encroached on the turfgrass areas in the city of Whittier. Here the weed is thriving on dry ground along a private residential parkway.



Looking from the top of the Whittier Dam into the Rio Hondo basin reveals a sea of alligatorweed. This weed displaces a great amount of storage water and fragments are often carried away by the public.



There goes a "start of another plant." This floater was found on the Rio Hondo River. Alligatorweed propagates through the spread of plant nodes. Seed is seldom if ever found in the United States.

Alligatorweed

Control Program Saves

Problem Identification

By **WESLEY G. HILL & ROBERT G. DONLEY**
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 Weed and Vertebrate Pests
 Los Angeles County, Calif.

ALLIGATORWEED, a real southerner from South America, has been choking North American waterways for nearly 85 years. Literally millions of dollars have been spent on research and control methods to eradicate this weed from waterways throughout the southern states.

More recently, this pest which produces no viable seeds in the United States, has been reported in other sections of the country, and more particularly in southern California. As early as 1946, a University of Southern California botanist recorded the presence of the weed along the Rio Hondo River north of the Whittier Narrows Dam.

Ten years later plants were observed along a five-mile segment of the river. Subsequent investigation showed spot infestations in the concrete bottom of the Los Angeles River. Heavy mats of the weed extended out over the edge of the flowing Rio Hondo River where the bottom was unimproved dirt. In the basin behind the Whittier Narrows Dam, alligator weed had increased to solidly cover an area of forty acres. This represented the largest single find of plants.

In the San Gabriel River, alligatorweed was found in numerous places, especially along ten miles of unlined river bed. Additionally, a total of 19 satellite infestations have been located on private and public property in Los Angeles county from 1966 to the present. In almost every case, the origin of these finds can be traced to alligatorweed infested soils removed from the site of the parent infestation.

In Tulare county, the situation was somewhat different. Alligatorweed was first found in December 1965 near Porterville and Visalia. Concern was expressed about the rapidity of infestation because two large flood control and recreation lakes had just been completed only a few miles from both findings. Game and pan fish could be endangered by reduction in oxygen supplies. Many of the desired fish would then be killed and predatory fish populations would begin to rise.

Also, researchers were worried about decaying mats of Alligatorweed which produce hydrogen sulfide, a gas toxic to fish and other organisms. Recreations in other ways could be hampered.

Of prime interest though was agriculture's dependency on water throughout the San Joaquin Valley. Alligatorweed infestations were reported to reduce delivery

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ALLIGATORWEED ERADICATION PROBLEM IDENTIFICATION (from page 14)

of water by 80 percent in some channels. And to top it off, mosquito populations, which thrive in infested waterways, were becoming difficult to control.

Thus, in 1966 the California department of agriculture and the Tulare county agricultural commissioner's office launched a concentrated effort to eradicate alligatorweed. Surveys of over 300 miles of waterways disclosed 72.6 acres (29 miles) of infested channels and a small amount creeping into irrigated cropland.

The problem was complex and staggering to imagine.

A better understanding can be gained, however, by noting that one measured plant produced 56 feet of lateral foliage growth in one season. Upwards of four tons of root growth per acre in the top four inches of soil and a depth of fleshy roots three or more feet into the soil have been reported. The hollow, crisp stems of the plant are buoyant, break off readily and float downstream to create new infestations. Nodes occur every two to eight inches and quickly produce roots or foliar growth.

Back in Los Angeles county, we weren't overly concerned initially with the alligatorweed infestation because of its reported aquatic nature. At first it appeared the weed had nowhere to go except into the ocean where it would perish in the salt water. However, this was not the case.

As we continued our investigation, the situation that unfolded had all the drama and intrigue of a motion picture thriller. The Rio Hondo and the San Gabriel rivers converge to within one mile of each other at the Whittier Narrows. The dam straddles both rivers at that point. Above the dam, the Rio Hondo is unimproved for two miles and the San Gabriel for about three and a half miles. Below the dam the Rio Hondo is concrete-lined and the San Gabriel remains dirt-bottom for another 7.2 miles before it becomes concrete-lined to the ocean.

Additionally, each river below the dam can be diverted into several hundred acres of adjacent groundwater replenishment basins. This is the basis of a major flood control/replenishment system operated by the Los Angeles County Flood Control District.

Silt deposited by flood waters in the basin area displaces water storage capacity by about 20 acre-feet annually. Full storage capacity is needed about twice a year. On the other hand, this silt soil is highly desirable to nurserymen for potting soil, to contractors for a variety of fill-dirt needs and to householders wanting some easily accessible free soil. Since the silt deposits had to be removed for water storage space, the county was happy to provide it to taxpayers.

But the plot became more complex when it was discovered that the soil contained nodes, stems and other parts of alligatorweed. Movement of soil perpetuated the spread of the plants.

In 1970 we put a hold on the soil. The U.S. Army Corps of Engineers and the Los Angeles County Flood Control District, agreed to halt soil movement out of the area. In addition, Los Angeles county joined Tulare and Kings counties in being proclaimed an alligatorweed eradication area by the California department of agriculture. This strengthened our legal control over infested premises, but because of the area's size and accessibility to the public, it didn't completely halt unauthorized soil removal.

Also in 1970, an infestation of alligatorweed was discovered at Puddingstone Reservoir, a county park's recreational facility about 26 miles from the parent infestation. We obtained funds from the county fish & game commission to subsidize detection surveys at all similar county facilities having standing bodies of water. No additional infestations were found. But the threat of an outbreak was ever present.

The problems we faced that year were acute. Without water, crops turn brown, floods cannot be contained and disaster is eminent. Because Tulare county was already in a testing and control program, many of their methods of control were quickly adapted to Los Angeles county.

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(continued on page 70)

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Work crews from the Lower Tule Irrigation District remove alligatorweed with a backhoe. Mats of the weed become so thick that water cannot flow along the ditches.

ALLIGATORWEED ERADICATION PROBLEM IDENTIFICATION (from page 52)

ment whereby funds from three areas are used to subsidize our eradication program. The state-county agreement provides \$7,000; the Los Angeles County Flood Control has budgeted over \$50,000; and, the U.S. Army Corps of Engineers District has been asked for \$13,000 and is cooperating in the control efforts.

Our program objectives are: 1. to remove the foliar mats of alligatorweed by use of foliar sprays or by hand. Each node in the stem is a reproductive part which can infest or re-infest if care is not taken in normal removal procedures. 2. to kill the perennial root structure of the plants.

Through these objectives we have been able to appreciably diminish the original 40 acres of alligatorweed mat. This has been aided somewhat by the removal of 800,000 tons of soil under quarantine restrictions that have accumulated over several years of silt deposit. Though large quantities of alligatorweed roots remain in the area, the working agencies have prevented reestablishment of the previous mat. They have also attempted to maintain general vegetation control in an effort to chip away at the rootstock of alligatorweed.

It should be pointed out that general vegetation control in the entire infested area is a constant battle. Ample sub-surface water or occasional inundations bring forth a variety of brush species and broadleaf and grassy annuals and perennials. Yet it is needed in order to more quickly identify and control alligatorweed.

As the downstream reinfestation potential is reduced by our eradication efforts behind the dam, we expect to begin eradication work on the infestations in the spreading grounds. Then too, we will pay closer attention to alligatorweed growing in the cracks of the concrete river bottom.

Our program will lead to success. This is evidenced by the excellent eradication program in Tulare county. Perhaps of more importance is the awareness we've created of a specific weed problem and the potential threat it harbors to agriculture and recreational fresh waters in California. Agencies, departments, individual citizens and others have expressed genuine concern and cooperated in making the eradication program for this tri-county area work.

We recognize that as we make progress the workload becomes bigger. Spraying big mats is easy. Finding isolated surviving plants, hidden in a jungle of other vegetation requires hours of intensive search by dedicated men. It is this dedication that is the foundations for a successful alligatorweed eradication program. □