Army Corps engineers and brush/weed killers control

Mississippi River Floo

Spraying of vegetation along the Yazoo keeps fast-growing willows in check. Barge can spray 6 miles of riverbank daily.

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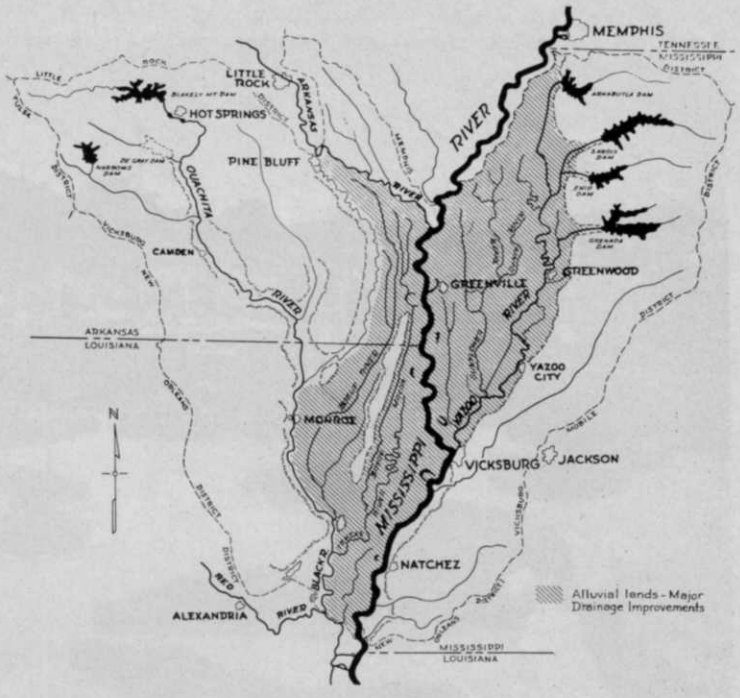


U.S. ARMY ENGINEER DISTRICT, VICKSBURG

FLOOD CONTROL on the Mississippi River is no longer a sandbag operation where levees and stopgap methods are used only in emergencies.

Today, army engineers believe they have developed a system which will control the superflood, the kind such as the 1927 disaster that comes along every 100 years or so. They are using a combination of holding areas, floodways, canals, levees, and emergency backwater areas. The general idea is to be able to move a heavy volume of water when flooding occurs.

A major phase of this control program is keeping the floodways and canals open. Mechanical methods have become dated. Switch willows which choke water outlets cannot be kept back by clearing with handtools along along the 2000-mile system. After cutting, switch willows capture debris and silt and in as little as 5 years can clog channels and practically choke off the outlet. Further, hand cutting costs today are prohibitive.

By contrast, herbicides will do the job. A spray boat can cover 6 miles of riverbank in a day, and within a few hours brush and trees will be dying. "Ammate" X weed and brush killer is now being used to kill woody growth, and control the plant down through the root system to prevent regrowth. Big plus is that this chemical kills the willows, yet permits stabilizing grasses which reduce erosion to thrive.

Corps Responsibility

The Army Corps of Engineers is charged with responsibility for a flood control program. Following Congressional authorization in 1928, the Corps developed a Waterways Experiment Station at Vicksburg, Miss. Many programs and methods have been developed through the years, but none has had to withstand the onslaught of flood waters as great as the flood of 1927. At that time, 28,000 square miles of land was inundated and more than 700,000 persons in a 9-state area made homeless. An estimated 300,000 head of livestock was lost and 313 persons lost their lives.

Speaking of this disaster, John W. Anderson, technical liaison Corps officer at the Vicksburg office, says this 1927 flood was the once-in-a-hundred years event. Planning and construction today, he says, is aimed at controlling a superflood which might occur only once in 500 years.

The Corps has developed a hydraulic scale model of the Mississippi basin. It serves as a design aid in planning new levees, floodways and general control measures. The Vicksburg district office will serve as an intelligence command post during any coming emergency.

Should a new major flood occur, trouble is expected first at Cairo, Ill., where the Ohio and Mississippi rivers join. On the model can be seen the floodway across the river at New Madrid, Mo., where much of the flow

Scale model of Mississippi River and its tributaries shows visitors at the Waterways Experiment Station how the flood control operation works.

would be diverted to a holding pool. This pool site exists between the old river levee and a new protective rise constructed 5 miles inland.

Holding areas are located further downstream. These are actually lakes left behind when the engineers eliminated 170 miles of horseshoe bends from the river and provided it with a more straight, deeper, and generally more efficient channel.

Tributary Streams Vital

Besides the Mississippi itself, tributary streams are a vital part of the overall control system. The lower basin of the Yazoo River is planned to serve as an emergency backwater area. During earlier floods, this area between Memphis, Tenn., and Vicksburg often became a 65-mile wide lake. Anderson has reason to believe that with the present control plans which include 4 dams, that this area may be the most trouble-free spot along the entire river, should a major flood emergency occur.

Engineers and others who are expert in the field believe the climax of any flood on the lower Mississippi will come below the Delta. They propose to split the flow into 3 channel areas in moving the heavy volume of water into the Gulf of Mexico. Estimated volume is expected to be almost 3 million cubic feet per second, which is more than 10 times the average flow at Niagara Falls.

Delta Seems Secure

The question, of course, is how well will the defenses work during a major flood. Corps officials say that installations built prior to the floods of 1937, 1945, and 1952 proved adequate, but they have not had to withstand the so-called superflood as yet. One problem which engineers foresee is the hazard to new urban areas which have been building up more and more in the flood plains of rivers and streams. This trend points to big flood losses in areas which are not included in federal or state programs for flood control.

Security of the Delta area hinges on towering levees and a full-scale effort to provide the flood plain with an efficient rainfall runoff system. Key to accelerated runoff is control of the fast-growing vegetation which without control quickly chokes off canals, streams and ditches which drain more than a million acres in the area. This is the assignment being handled by a regular schedule of spraying with an herbicide.

The 2000-mile drainage network is sprayed by teams working from a barge, via boat, and on foot. Assistant operations chief W. W. Gray reports that the Yazoo basin was once largely overgrown with switch willows which for practical purposes eliminated stream flow. Gray now uses a barge for spraying the main riverbanks, treating up to 6 miles daily. Boats are used on small streams and foot crews in further inaccessible areas.

Pelucia Creek is an example of mechanical clearing and regrowth, pointed out by Gray to show the futility of doing the job without benefit of weed and brush killers. Gray states that this area was cleared with machetes and axes some 12 years years ago and now is so overgrown and filled with silt that even a canoe could not operate.

Formerly, Gray continues, gangs of 50 men or more literally hacked their way through swampy stands of willow and cottonwood. Work was slow, hazardous, and expensive. Once vegetation was cut, willows sprouted from the stumps and roots. Stumps and regrowth then captured islands of debris and silt. Within a few years the outlet system disappeared. This led the Corps of Engineers to turn to chemical control.

The Corps has been using DuPont's "Ammate" X because it gives the kill needed, yet does not create toxicity problems for

men applying it or to fish and wildlife. Neither are windborne vapors a problem to farm crops which are a major economic factor of this area.

Water Spray Common

This particular chemical is nonflammable, dissolves easily in water, and may be sprayed in either a water solution or in an oil-water emulsion. Or it may be applied in crystalline form to stumps or notched trees. Normally, for riverbank spraying, the Corps uses it in the form of a water spray.

Gray, who supervises the riverbank crew operations mixes "Ammate" in large quantities. For each 100-gallon batch, a 60-pound bag of herbicide is poured into a deck-mounted, 500-gallon tank and mixed with water which is drawn directly from the river. A quart of DuPont surfactant WK is usually added to ensure complete wetting of foliage. Pumps which produce nozzle pressures up to 800 psi permit boat teams to spray 30- to 40-foot wide bands of vegetation along the stream bank.

Cost for initial clearance, where full-grown trees and brush must be thoroughly wet down for control, averages $400 per mile, or about $100 per acre. This compares with mechanical clearing costs which are 2½ times greater or about $250 per acre. Maintenance after the initial clearing runs $135 per mile, or about $30 to $35 per acre per year.

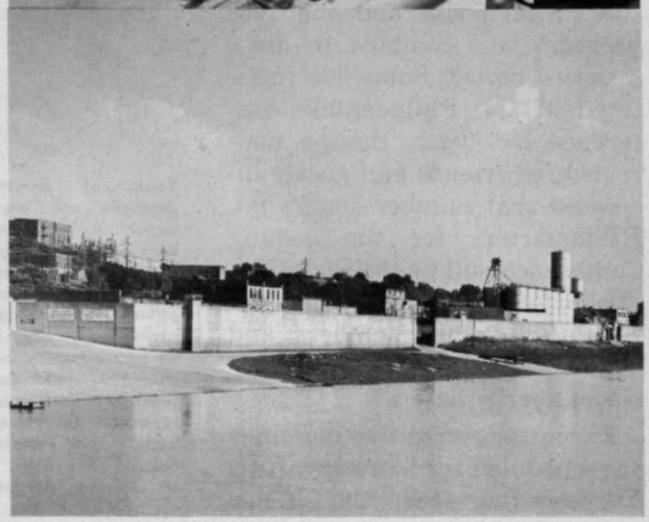
Most of these costs are based on spraying from barges or boats. Where these cannot operate, such as on the BoBo Bayou operation last year, a tractor-drawn tank rig is used alongside the stream. Roadway or path for the tank rig in this instance was opened up by a bulldozer. "Gunmen" carrying spray hoses from the tank then penetrated to the stream bank on foot and sprayed vegetation.

Research and trials are now being carried out using the new "Hyvar" X-P bromacil brush killer, also made by DuPont. Pellets of this herbicide are applied at the base of trees and after being carried into the soil by rain, attack the root system. This is a slower process than spraying, but it can prove helpful where men and equipment cannot effectively operate.

Value of the entire operation will become readily apparent in the event of a major or super type flood. Should this happen, chemical control of streambank vegetation may prove to be the factor which made protection possible for homes in the flood plains area.

Flood gate and pumping plant at Yazoo City remove collection of interior drainage.

Barge from which 500-gal. batches of chemical-water mixture are sprayed can cover 6 miles a day.



Flood wall protects an industrial area and railroad yard in Vicksburg against flooding.