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IMPORTANT WATER QUALITY AND QUANTITY ISSUES FACING ALABAMA AGRICULTURAL PRODUCERS

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Introduction

Few states can match Alabama's water resources which consists of 14 major rivers and streams, 348,826 acres of lakes and reservoirs, 50 miles of coast, 400,000 acres of estuaries, and over three million acres of tidal marshes and wetlands. Historically we have taken our water for granted, but concern over issues on water quality and quantity is increasing and will have greater impacts on agriculture in the future. In 1989 the Governor created a Water Resources Study Commission which just recently reported to him on the status of the state's water resources. This Commission has recommended policy initiatives or regulations that will be needed to protect the quality and quantity of Alabama's waters for future growth and development.

As with most other states, point source pollution from industrial sources and municipal waste treatment facilities created the bulk of the water pollution problems in Alabama until recent years. A regulatory program in place since 1972, however, has made major reductions in point sources of pollution of Alabama's streams. Now a much greater percentage of the remaining pollutants come from nonpoint sources, according to the Alabama Nonpoint Source Assessment Report (ADEM, 1988). Agriculture is labeled as one of the primary contributors of nonpoint pollution, with the primary pollutants being sediment, ag-chemicals (pesticides and fertilizers), and animal waste.

With the great diversity and abundance of water in Alabama, water quantity issues have not been of great concern. In recent years however, drought conditions coupled with greater demands for water supplies have revealed that there are limitations to the availability of our water resources. We can't always get water where we want it and when we need it most. So goes the hydrologic

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cycle. Agricultural producers have to deal with periodic flooding as well as periods of drought. Both can negatively impact crop production.

Water Quality Issues

Water quality is one of the top three environmental issues in the country. President Bush made water quality a national initiative on February 9, 1989, and many agencies, USDA included, have since developed programs to address water quality in everything they do.

The three primary agricultural-related water quality concerns in Alabama are sediment, chemicals to include nutrients and pesticides, and animal wastes.

Sediment

Sediment, a by-product of erosion, which discharges to lakes streams and waterways, impacts on both water quality and quantity. Soil erosion from agricultural land in Alabama averages about 7.1 tons per acre annually and is the sixth highest in the nation. However, only 10 to 20 percent of the eroded soil material actually reaches water supplies in a given year.

The primary accelerated erosion concern in the past has not been sediment effects on water quality or quantity, but the negative effects of erosion on soil productivity. Although soil erosion is still an important issue more people now appear to relate more to the effects of sediment.

In Alabama, as in most of the Southeastern states, sediment from soil erosion is still the largest single nonpoint source water pollutant by volume, and agriculture is the primary contributor. The reason for the interest in sediment is simple. It can serve as a transport medium for chemicals (nutrients and pesticides in particular) that move in association with sediment. This is a special concern in intensive crop producing areas. Even SCS is now shifting programs to address water quality effects of soil erosion. Controlling soil erosion and sediment movement will continue to play a major role in reducing water pollution from sediment, nutrients, pesticides and animal wastes that have been applied to the land.

There are intensive vegetable and small fruit production areas on steep erosion-prone lands in many parts of Alabama. Water pollution from these areas has largely been ignored because field sizes and total acreages are relatively small. This will change.

Agricultural Chemicals

The greatest water quality concern and the issue that gets the most attention in Alabama, as elsewhere, is agricultural chemicals and in particular - pesticides. Ground water monitoring thus far does not indicate any significant contamination from normal uses of pesticides in Alabama. Where chemicals have been detected in ground water, spills or contamination near the wellhead appears to be the primary cause.

There is much concern that food and water are becoming more contaminated from modern agriculture that uses a multitude of chemicals for nutrition and crop protection from pests. This fear of technological innovation is a phenomenon that can seriously hurt America's competitive agricultural advantage in a world market.

Below is a pertinent statement by Lowell S. Jordan, a professor in the Botany and Plant Sciences Department, University of California at Riverside. He is 1991 President-elect of The Council for Agricultural Science and Technology (CAST). The article I quote from was contributed to NewsCAST magazine, Autumn 1990, Vol. 17, No. 4.

> "The American food and agriculture system provides U.S. citizens with the greatest abundance of the highest quality food ever consumed by any people at any time in history. Despite this fact, some individuals challenge the integrity of the present food and agriculture production system and the quality of its produce. Several individuals or groups, who have failed to change the system either through persuasion or the normal legislative process, have resorted to initiatives to force their demands for change. An example is the severely restrictive Proposition 128 entitled The California Environmental Protection Act of 1990."

This Act was commonly referred to as 'Big Green'. The most far reaching ramifications of this Act, although it did not pass, was its proposal to set zero tolerances on many agricultural chemicals that would have resulted in the banning and deregistration of most pesticides in the state of California. This type of legislation would have major impacts on what happens in other states. Action such as this could cause a shift in production areas of some crops or lead to greater imports of other commodities. The general feeling among many agricultural scientists is that 'zero tolerance' legislation for chemical contamination of food or water is too prohibitive, and would seriously hurt American agriculture.

The simple fact that this type of proposition was even considered, means the entire agriculture sector must do a better job in handling and using chemicals, as well as do a better job in educating the public on the many benefits of chemical use in agriculture. Consumers need to be able to relate better to the health risks they take in consuming produce or drinking water with low levels of synthetic chemicals

There are certain health risks associated with all chemicals, including those chemicals used in the pharmaceutical industry. Although all foods and most water contain millions of naturally occurring chemicals people are more afraid of synthetic chemicals. Many people do not realize that plants synthesize their own chemical protectors. These plant-made pesticides are similar to man-made pesticides in the risk they pose to us. Drugs are probably the only group of predominantly synthetic chemicals most people consider good, since they are designed to improve health and thus increase the length and quality of life.

Animal Wastes

The most significant water quality problems attributed directly to agriculture in Alabama come from animal wastes. High concentrations of animals, broilers in particular, in relatively small areas, are beginning to impact both surface and ground water quality in specific areas of the state. Waste from the poultry industry in Alabama alone has been estimated to be from 1.7 to 2.0 million tons of manure and litter annually. This material, which is treated as a waste product by many, could supply a major part of the fertilizer needs for Alabama crops. This may not be feasible. Certain aspects of handling, storage, processing and transport must be worked out.

Poultry production already accounts for over 40 percent of the cash farm receipts to Alabama producers, and is expected to increase in the near future. This growth may come to a sudden halt, however, unless progress is made in proper handling, storage and utilization of poultry waste and litter in ways to prevent water quality problems. Currently several organizations and agencies, including scientists from at least five Auburn University departments, are involved in studying poultry waste management and alternative uses.

Water Quantity Issues

Water quantity issues are hard to deal with since water is constantly changing in form and moving from one place to another. The economic development of many communities is tied directly with commerce or industry, most of which are dependent on water supply. Future development will require large volumes of water, and competition for available supplies will increase with time. Agricultural development is and always will be highly dependent on a readily available supply of fresh water.

Water Uses

Water use is generally divided into two main categories, consumptive and nonconsumptive uses. These are similar but not always the exact same as withdrawal and nonwithdrawal uses. In withdrawal or off-stream uses, water is taken from its natural setting in streams, lakes, or aquifers prior to being used. For nonwithdrawal use, water is not taken from its natural setting. Navigation, hydroelectric power generation and recreation are the three primary nonwithdrawal uses.

Six withdrawal uses of water are generally inventoried in Alabama. These include public water systems, industry or commerce, agriculture, domestic uses, mining, and thermonuclear power generation. The first three are considered the major water consumers. In many industries some of the water usually goes back into a stream; whereas, in agriculture most water is totally consumed. The primary agricultural uses are watering of livestock and irrigation. Another agricultural use that is rapidly increasing in Alabama is aquaculture. Of all the withdrawal uses, agriculture currently uses less than two percent.

Alabama's Water Budget

The precipitation that helps replenish our fresh water supplies averages about 55 inches annually. Approximately 33 inches of this water goes to evaporation and transpiration, while 22 inches goes to stream outflow. About 7 of the 22 inches goes to infiltration and ground water prior to discharge in the outflow. Alabama's water supply is ample for any human demands that we could imagine, except for two reasons. It is extremely variable and the distribution is far from uniform. That's why the two primary water quantity issues in the state are flooding and shortages.

Flooding and Shortages

Although flooding results in great property damage and can be life threatening, water shortages are usually of greater concern because they occur more frequently and affect more people. Water shortages occur for one of two reasons; because of over-use or improper development of water resources, or because of droughts. The most severe drought of record was in 1954 and affected the entire state. Average rainfall in 1954 was more than 20 inches below normal and stream flows reached 30-year lows. We have drought periods in some part of the state almost every year. We have had what could be classified as two or three major droughts in the 1980s alone, the most current in 1990.

Droughts have several impacts on agriculture. The most severe may be putting producers without irrigation out of business. These drought periods and greater demands for a stable high quality water supply have resulted in increased pumping of ground water supplies during recent years. Many industries and communities are beginning to look to ground water as their major supply. This could cause water priority issues to develop in the future.

Water Resources Planning

Most states, Alabama included, have no established water resources database of their own. In Alabama there also is no state agency to set policy or develop long range planning for water development and use in the future. The lack of such a planning process could hinder economic development in Alabama, especially where ground water is the major supply. Without information on aquifer productivity, storage capacities and ground water movement, it will be difficult to establish strategies for compatible aquifer uses. This could slow economic growth and development, especially in south Alabama, where people are more dependent on ground water supplies.

Water Laws Governing Use

For everyone to have an equal share of water, laws have been adopted on control and use of water. These laws apply mostly to water flowing in streams but in some states the use of water from lakes and wells are also controlled.

People living in the eastern half of the United States under the old English law called the "riparian doctrine" have no legal right to use water from a stream or lake. Those living in most of the Western States must have earned the right by being the first to use the water under the "prior appropriations doctrine".

Under the "prior appropriations doctrine" no one can use water from a source if it reduces the amount needed by the first user. The only way you can get water from this stream is by purchasing the water rights from the prior user, or his heirs, or by purchasing the land and water rights.

Under the "riparian doctrine" you have no right to take any water from a stream or cause any change in the natural amount of flow in the stream. This is true even if you own the land next to the stream. However, it is generally accepted that you can use water from a stream as long as you use it on the land immediately adjacent to the stream and do not deprive someone else from using it who is dependent upon the water downstream. A person downstream, can claim a need, or a future intention of use, and legally prevent you from using the water upstream.

The drilling of wells is controlled in some Eastern and Western states but not in others. The drilling of wells is not controlled in Alabama, although there are well drilling standards.

Be sure you have a legal right to use water from a particular source before investing in irrigation equipment. Specific legal aspects of both surface and ground water rights are not clear in Alabama. Surface water rights and water use have not been subject of much legislation or court decisions, and therefore have not been combined into a uniform code or body of statutes. The legal decisions of ground water use in Alabama thus far has come out of mining controversies. The 'reasonable-use' rule applies to ground water in Alabama. This means a landowner has right to reasonable and beneficial use of waters upon and underneath his land, provided the waters are not wasted or do not cause injury to others.

Litigation on misuse of ground water will be forthcoming. The most common situation will occur when new and larger users deprive landowners of their reasonable use by depressing water levels in nearby wells. Users of large volumes of ground water should be prepared to compensate nearby landowners for damages.

Summary

Environmental issues will probably have greater impact on agricultural production and markets than any other policies throughout the 1990s. One of the areas of greatest impact will be water quality. Proposed "negligible risk" or "zero" tolerance regarding harmful chemical residues in food and water supplies will continue to receive much attention. In reality this may be impossible, but radical environmentalists will continue to use the media to scare the public, and Congress will respond.

There will be more legislation enacted and policies promoted to protect water, especially ground water, from agriculture pollution. Expect to see more ground water advisory statements on pesticide labels. Systems that utilize lower inputs of pesticides and follow organic production practices will be encouraged.

There appears to be a growing concern for nitrates in ground water across the country. The highest concentrations of nitrates in ground water in Alabama are most often traceable to animal waste or human waste from home septic tanks. I do not believe we will see sweeping changes prohibiting chemical fertilizer use. It is worth noting, however, that some countries in Europe have written laws already banning the use of nitrates. Some states, Nebraska for example, have adopted regulations restricting the amount of nitrogen fertilizer that can be applied to a particular crop within a given time frame. There is interest in some type of regulations to protect against chemical spills at storage and distribution sites. This could protect dealers from the liability of having to clean up a contaminated water supply later on.

Protection of wetlands and other fragile lands will have greater impacts on agriculture in the near future. Wetlands are classified as waters of the United States. They are critical links in natural ecosystems that act somewhat like kidneys to protect soil and water resources from degradation, and also serve as a habitat for important plant and animal species. We will probably see increased regulations in the U.S. for protecting wetlands and penalties on producers who try to plant on that acreage. The 1990 farm bill calls for loss of eligibility for federal subsidies upon conversion of a wetland to agricultural production. What you can and cannot do if you are already farming wetlands is becoming more uncertain all the time.

Conclusions

In the future there will be greater competition for water regardless of the quantity available, primarily because there will be more people.

One of the dominant factors affecting what we grow, how we produce it, what we sell, and even where we sell it in the future, will be environmental policy.

Individuals will be held more accountable for actions they take that contaminates a water supply. Regulations just passed in February of 1990, gives the Alabama Department of Agriculture and Industries the authority to levy civil penalties for the misuse of pesticides by private applicators. The maximum penalty for misuse of a restricted-use pesticide is $10,000 and the maximum penalty for misuse of a nonrestricted-use chemical is $5,000.

Most people would probably not be willing to completely ban the use of pesticides in agriculture if they knew all the facts, and thought their food costs would double or triple with a reduction in quality, supply and variety available.