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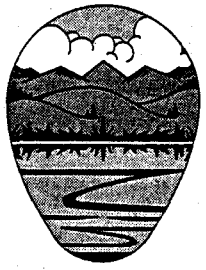


POULTRY WATER QUALITY CONSORTIUM

The poultry industry and three government agencies have formed the Poultry Water Quality Consortium to promote better environmental management by the rapidly growing poultry industry.

The Consortium encourages the use of poultry by-products as a resource rather than letting them become a pollution source. As the industry grows, protecting natural resources is becoming a major priority, demanding new technologies in poultry by-product development, storage, utilization, and land application.

The Consortium is responding to this challenge by promoting cooperation and information exchanges between government and industry on water quality and by-product utilization issues. By focusing on pollution prevention, the Consortium encourages the development and transfer of new technologies designed to protect water quality and promote a clean environment.

Members of the Consortium:

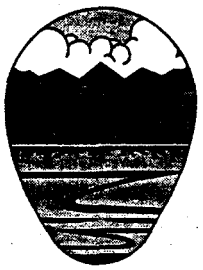
- Southeastern Poultry & Egg Association
- U.S. Department of Agriculture – Soil Conservation Service
- Tennessee Valley Authority
- U.S. Environmental Protection Agency

Contact

Poultry Water Quality Consortium

Larry D. Goff
Liaison

TVA - CST17D-C
1101 Market Street
Chattanooga, Tennessee 37402-2801
423-751-7297 Fax: 423-751-7648



Southeastern Poultry and Egg Association

The Southeastern Poultry and Egg Association (Southeastern) is dedicated to the growth and development of the poultry industry and represents the entire industry — from the producers of eggs, broilers, and turkeys, to the processors of poultry and egg products, along with the allied companies that serve the industry. The association emphasizes technology transfer, in order to ensure that knowledge and information are exchanged and shared. The association's extensive and diverse programs have been developed to help members keep abreast of rapid changes in the poultry and egg industry.

Services Available to Poultry Growers

Southeastern is best known for its annual International Poultry Exposition, held in January in Atlanta, Georgia. The Expo features the world's largest display of technology, equipment, and supplies used to produce and process poultry and egg products.

Continuing education is a high priority. The association's seminar program has expanded into a comprehensive schedule of workshops and clinics to keep the poultry industry informed. Twelve seminars are held each year.

Through its government relations program, Southeastern keeps Congress and federal agencies apprised of industry needs, and informs members of government actions.

The association's research program returns millions of dollars to the industry. Research grants are used to find better ways of producing poultry and egg products. Members are kept aware of industry developments through the distribution of newsletters, reports, and memos.

Contact

Don Dalton, Executive Vice President
Southeastern Poultry & Egg Association
1530 Cooledge Road
Tucker, GA 30084
Tel: (404) 493-9401
Fax: (404) 493-9257

U.S. Department of Agriculture
Soil Conservation Service

Agency's Commitment to the Poultry Industry

The Soil Conservation Service (SCS), an agency within the U.S. Department of Agriculture (USDA), administers national soil and water conservation programs with the cooperation of landowners and operators in local soil conservation districts and other government agencies. It provides USDA leadership to assist landowners and local groups to practice resource conservation. In this role, it protects and enhances the nation's surface and groundwater resources and provides technical assistance to the U.S. agricultural community to help plan, design, and implement waste management systems and other conservation projects. The 1990 Farm Bill focused the SCS on major agricultural concerns including pesticides, nutrients, animal waste, and agricultural pollutants in surface and groundwater.

Services Available to Poultry Growers

Through its conservation practices, the SCS provides planning, design, and construction assistance on waste treatment lagoons, manure and litter dry-stacking facilities, poultry mortality facilities, management, and nutrient management plans based on soils, crops, and equipment availability. It also serves as technical representative for USDA cost-share programs to implement nutrient and poultry mortality management systems; and, in some cases, provides financial as well as technical assistance in special project areas. The SCS works closely with state regulatory agencies in waste management.

Contact

For more information about SCS programs and assistance, call or visit the SCS office listed in your local telephone directory under U.S. Department of Agriculture.

RI / 3 – 6/94

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HB-2C, 1101 Market Street • Chattanooga, TN 37402-2801
Tel: (615) 751-7297 • Fax: (615) 751-7479

TENNESSEE VALLEY AUTHORITY

Agency's Commitment to the Poultry Industry

An overall objective of the Tennessee Valley Authority (TVA) is to develop and implement programs and activities that will further develop agriculture and agribusiness to protect the environment. The poultry industry is an integral part of the agricultural economy. Protecting water quality is a major concern as illustrated by TVA's ongoing projects related to proper management and use of animal wastes.

Much of TVA's work is accomplished in cooperation with federal and state agencies, and universities and private organizations concerned with animal waste management. TVA is in an excellent position to identify, demonstrate, and transfer poultry by-product resources technology to potential users.

Services Available to Poultry Growers

TVA's programs and projects primarily deal with helping prevent or reduce impacts of the industry on the environment. This service is accomplished through educational workshops and demonstrations in cooperation with other federal and state agencies to focus on preventing or reducing the environmental impacts of by-products generated by the poultry industry.

Current project areas are composting poultry mortality; animal waste lagoon management; production and marketing of poultry litter products for use as a soil amendment, fertilizer, and cattle feed; creating agribusiness that will produce and market poultry by-products; and conducting research and demonstrations that show correct use of by-products.

Contacts

Richard C. Strickland
Biotechnical Department
Tennessee Valley Authority
P.O. Box 1010
Muscle Shoals, AL 35660-1010
Tel: (205) 386-2542 • Fax: (205) 386-2129

Richard D. Urban
Water Management Services
Tennessee Valley Autority, HB-2C
1101 Market Street
Chattanooga, TN 37402-2801
Tel: (615) 751-7301 • Fax: (615) 751-7479

Larry Johnson
Community Partnership
Tennessee Valley Authority, CTR 2L
P.O. Box 1010
Muscle Shoals, AL 35660-1010
Tel: (205) 386-2887 • Fax: (615) 386-3880

RI / 4 – 6/94

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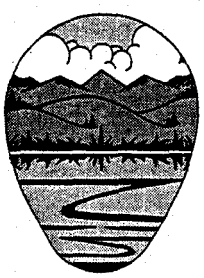
Tel: (615) 751-7297 • Fax: (615) 751-7479



POULTRY ENVIRONMENTAL ISSUES AND IMPACTS

In the United States, poultry is a major source of agricultural income. In 1992, the industry contributed over $12 billion to the economy of this nation. During the same period, U.S. exports exceeded 207 million pounds of poultry products, and U.S. per capita consumption of poultry reached 37.3 pounds per annum. Some 75,000 growers are involved in producing over 6.4 billion broilers, 269 million layers, 69 billion eggs, 285 million turkeys, and 20 million ducks; and recent estimates conclude that another half-million people are employed in hatcheries, live-bird processing plants, feed mills, and other allied operations serving the poultry industry. Both genetics and efficiency contribute to this magnitude of production.

These figures, which are projected to increase 5 percent each year into the future, are impressive; however, they also come with a yearly legacy of some 20 million tons of poultry manure and litter, over 50 million dead and unused carcasses, and over 50 billion gallons of water from hatchery, layer, and live-bird processing operations. These by-products must be safely disposed of or used. The challenge is where and how to use these poultry wastes to benefit the grower and the environment.

Traditional uses for poultry by-products are not always sufficient. Expanded or new uses for poultry waste have been found, such as enhanced fertilizers, horticultural and mushroom growing medium, and feed products for livestock, dogs, cats, and aquaculture. Indeed, a continuing search for additional uses is part of the challenge.

Protecting water quality, the environment, and the natural resources of this nation is a commitment of the poultry industry and growers. The industry shares responsibility with other segments of the agricultural community and other human activities for nonpoint source pollution: the pollution that originates from diffuse sources (e.g., stormwater runoff). Some industry practices could contribute to point source pollution: the pollution that issues from a known or direct discharge (e.g., from the end of a pipe).

One must understand the complexity of poultry operations when addressing water quality and environmental issues. The industry can be separated into hatchery, breeder, broiler-roaster-Cornish (meat types), turkey, egg, duck, and other poultry and live bird processing operations. Each of these operations produces either dry or liquid waste and dead birds. Environmental awareness has shifted beyond live-bird processing plants (offal, feathers, and wastewater) to the grower.

As any poultry grower knows, the speed, efficiency, and methods used to produce poultry and poultry products have changed drastically over the past 20 years. As a result of rapid growth, most poultry are grown in confined operations with limited use of water, except for drinking water for the birds. The expansion of the industry coupled with concentrating the growing operations has created a unique challenge — that of proper disposal of immense quantities of waste. It is important for producers and others to understand how poultry waste can pollute the environment. Each individual operation is different, yet many of the problems can be prevented or solved through proper waste disposal methods and changes in management and production methods during the production cycle.

It is important for producers to know (1) what is in the waste that must be disposed of; (2) how much waste is expected to be generated; (3) what are the impacts of the waste on water quality, the environment, and human health; (4) how these materials can get into the water; and (5) how to manage the waste in an environmentally safe manner.

The most overriding environmental issue facing growers today is the impact that poultry waste can have on water quality. Potential water pollutants from on-farm poultry operations can be classified as (1) nutrients and salts, (2) organic materials, (3) bacteria, and (4) viruses. These pollutants originate from manure and litter and dead birds improperly handled. How the waste is disposed of, treated, or managed has a direct influence on the cleanliness of surface and groundwater.

Properly managed poultry wastes from manure, litter, dead birds, and wastewater are profitable farm investments. An effective waste management plan provides for the proper collection, storage, handling, and use of poultry waste. Products derived from wastes reduce chemical fertilizer costs, improve soil quality, and protect water resources, air quality, and human and animal health. Effective waste management promotes a favorable public attitude toward the industry.

Disposing of dead birds is an increasing problem. Daily numbers and poundage of dead birds can be dictated by the birds' age and weight, the number of birds in the poultry house, and climatic conditions. Acceptable methods of disposal include (1) burial, (2) incineration, (3) composting, and (4) rendering. Burial pits may have severe environmental limitations in areas of porus or fractured soils that would allow leaching of nutrients to groundwater. Incineration has some limitations: the possibility of air pollution and fuel and labor costs.

Many progressive growers are switching to composting or to rendering as preferred solutions from an environmental and economic viewpoint. A grower must choose a method compatible with his or her individual opera-

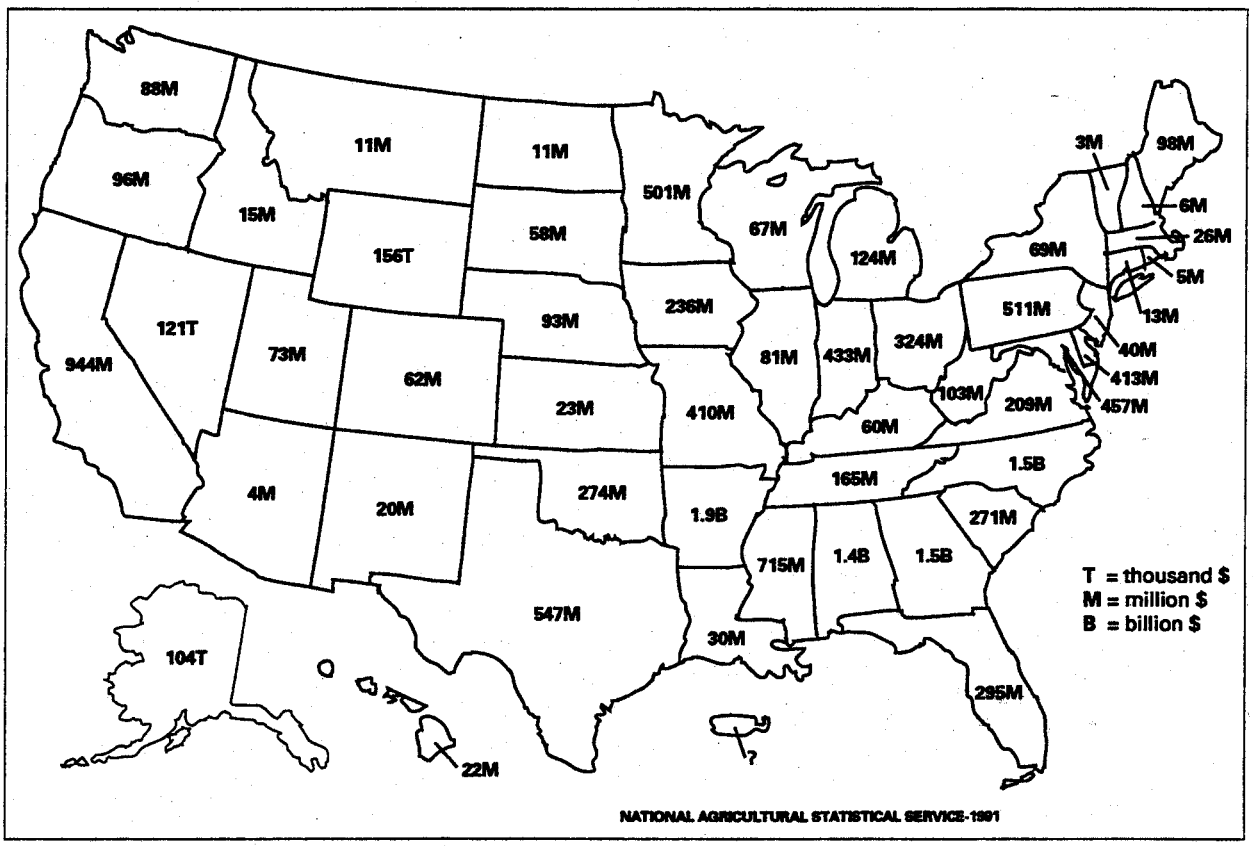
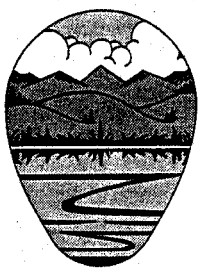


Figure 1.—Poultry cash receipts (in dollars).

tion and company preference. Dead birds must be treated as a resource that can add value to a grower's operation. Improper methods of disposal are unacceptable and cannot be condoned.

State regulations and permitting requirements vary from state to state and may be more stringent than national regulations. In general, environmental needs are site specific and regional in nature. Local sources of information, including industry associations, appropriate state agencies, soil and water conservation districts, and the USDA Soil Conservation and Cooperative Extension Service offices, should be consulted to ensure that your waste management plan complies with all state and federal regulations.

There is not a single best or optimal approach to protect or preserve water quality and the environment. Good waste management practices are essential if the poultry industry is to continue to grow and thrive under today's environmental challenges. The remainder of this handbook relates to the management of poultry wastes, mortalities, and wastewater. Information sheets on these topics provide management "guidance" to help poultry producers make sound environmental decisions; additional fact sheets discuss other environmental issues and alternative technologies, and sources of assistance are provided in the section on Resource Information (RI). Producers are encouraged to seek assistance from the appropriate state and federal agencies, private consultants, and other professionals on how to implement waste management techniques that protect water quality and the environment.



Protecting the Environment and Water Quality

Protecting natural resources is a major goal of the agricultural community in general, and poultry producers in particular, who care about the environment. The quality of our air, soil, and water resources, the welfare of our animals, and human health issues are important to us and to our children; they are our connection to the future. Water quality is the most important environmental concern of the poultry industry.

Environmental protection begins with awareness. We have to know what's at stake when we read or hear about water quality and conservation, or that high concentrations of nitrates or other contaminants have been found in surface and groundwater. We need to understand how the industry's waste management affects water quality. Above all, we must be able to assess the opportunities we have, as private producers and as an industry, to meet these environmental challenges head on.

Poultry growers and the industry must be concerned about the quality of water that comes into and flows from their farms or plants. The industry's first concerns are those that everyone shares: Does the water we use support our needs? Is it drinkable (potable) and palatable? What does it cost to supply water to our homes and businesses? Would additional costs for water treatment ensure its safety for our use?

Where the Water Is

Water covers 70 percent of the earth's surface, but only 3 percent of the earth's water is usable by plants, animals, and humans. Usable water exists either as surface water or groundwater. Surface water is the runoff that flows above ground through rivers, streams, and springs until it eventually drains into the sea or oceans. The land area that collects runoff in defined locations is called a watershed, and no matter how far one lives from the water, everyone lives in a watershed (see Fig. 1).

Groundwater is water that percolates through the soil or enters the earth's subsurface through sinkholes, permeable soils, and fractures in rock formations. The underground water formation is known as an aquifer within which the groundwater moves in various directions. Some aquifers are several hundred feet deep while others lie near the surface of the earth. The upper level of shallow aquifers is called the water table. It rises and falls depending on how dry or wet the season is, or how much groundwater is extracted for use.

Water is a renewable resource; therefore, surface and groundwater are constantly being replenished. But water can also be used up faster than it can be renewed or, in the case of groundwater, "recharged." Groundwater recharge is enhanced by limiting runoff. Human activities that speed runoff or add contaminates to surface and groundwater must be controlled. Land sediments, animal wastes, pesticides, detergents, oils, and grease are some of the human contributions to poor water quality.

Understanding Water Pollution

Strictly speaking, pure water does not exist. Even rainfall contains gases, dust, and ions acquired from the air. In fact, water (a molecule containing two hydrogen atoms and one oxygen atom) is a solvent; its ability to dissolve

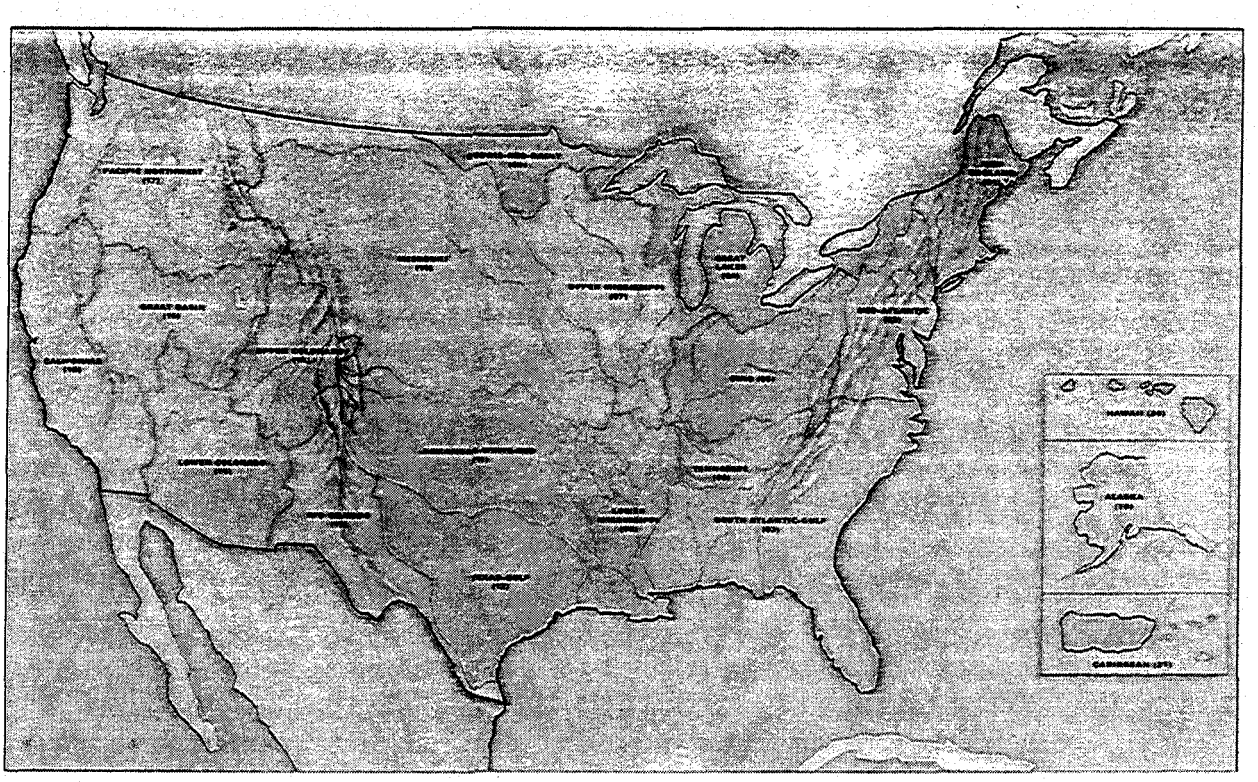


Figure 1.—U.S. Watershed Regions (Brown and Caldwell).

substances is essential to plant and animal life. Most of the substances, elements, or compounds that we think of as pollutants are also found naturally in water: nitrogen, phosphorus, potassium, calcium, magnesium, sodium, bicarbonate, chloride, sulfate, carbon dioxide, oxygen, and some heavy metals. But when one or more of these substances is found in excessive amounts, the water's use is impaired and the water may be considered polluted.

Potentially polluting substances, sometimes called dissolved substances or solids, can be organic or inorganic, and they occur in natural interaction among the elements of earth and sky. Their effects include color (or lack of clarity) and offensive taste and odor. They can be added to the water during industrial, agricultural, silvicultural, land development, or other activities that serve human needs and pleasures. In the poultry industry, for example, components of manure, dead birds, and wastewater include nutrients that may be released to water through direct discharge, excessive runoff from the land, or leaching through the soil.

We expect, then, to find some dissolved substances in water; however, water's properties are degraded — its quality impaired — if it contains chemical, biological, physical, or radiological substances in sufficient quantity to restrict its use. Water quality standards defined by the U.S. Environmental Protection Agency (EPA) identify what substances must not appear in water and at what concentrations other substances may be permissible under certain conditions. Tests or analyses performed on drinking water, surface, and groundwater illustrate the complexity of the issue.

✔ This information sheet has introduced the topic of water quality. Poultry growers and others should always check with local health agencies or state departments of environmental protection or similar agencies to ensure that they have access to current water quality criteria and standards applicable to their location. Water quality criteria are published in the Federal Register as they are developed.

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