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EPA AND THE FARMERS
U.S. ENVIRONMENTAL PROTECTION AGENCY

Farming and The Environment



The days are now longer than the nights. The caroling of robins greets the dawn. Once again we have escaped winter's grip and it's spring in Washington.

Across the land on farms large and small, a new growing season has begun. Roosters strut and crow in the barnyard. Nature's pulse is speeding up. Green fields promise another bumper yield of food and fiber crops.

As the sixth anniversary of the original Earth Week approaches, EPA Journal looks at how the Agency's efforts to protect the environment affect agriculture.

We begin with an interview with Administrator Russell E. Train, who is himself a part-time farmer on Maryland's Eastern Shore. Mr. Train notes that what is good for the environment is usually good for agriculture and vice versa. After all clean air and water are vital to the farmer.

EPA's effort to discover ways of reducing the multi-million dollar damage to farm crops by air pollution is reviewed in an article about research being conducted by our laboratory in Corvallis, Oregon.

Across the country farmers are brushing up on their knowledge of pesticides as a new program begins to ensure that users of the more potent chemical pest killers apply them in a safe manner.

At the same time, EPA is taking a fresh look at the thousands of pesticides registered with the Agency and classifying them into either "general" or "restricted" use. While the general-use pesticides would be available to everyone, restricted pesticides could be applied only by persons who have shown that they know how to use the products safely.

These important new pesticide programs, designed primarily to protect the health of farmers, farm workers and their families, are discussed in two companion articles.

Also in this issue are excerpts from an important speech by the Administrator on "Testing Chemicals, Not People." Mr. Train points out that in the past few decades and especially since the end of World War II, a great many new chemical compounds for pesticides and other uses have been released with little or no knowledge of their health effects.

Efforts to control major agricultural sources of pollution are the subject of two articles, one from Region VII in Kansas City on cattle feedlots and the other from Region V in Chicago on steps taken to reduce the washing of eroded soil into waterways.

The magazine's Inquiry department reports on garden plans of some EPA employees. For the benefit of city residents, a former EPA official, William Olkowski and his wife, Helga, have written a book designed to help those with only the tiniest backyard or balcony to grow their own food. Titled "The City People's Book of Raising Food" and published by Rodale Press Inc., the book reflects a strong environmental concern.

Other subjects covered in this issue include:

A report on the study of earth cores by our laboratory in Ada, Okla., to help find ways to reduce the salt accumulating from irrigation waters.

Articles from our Region IV office in Atlanta, Ga., on how this section of the Nation's sunbelt is making determined efforts to protect its environment from the impact of industrial and population growth. □

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U.S.
ENVIRONMENTAL
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EPA'S ROLE IN AGRICULTURE

An Interview with Russell E. Train, EPA Administrator and Farm Owner

What does EPA do to help farmers? Should environmental objectives always take precedence over agricultural needs? How much of a threat does use of pesticides pose to human health? Did we learn anything from the Kepone poisoning incident? Could enforcement of environmental regulations cause a decline in food production? Mr. Train answers these and other questions.

Q. What does EPA do to help farmers?

A. It helps protect and restore clean air and water, which are absolutely essential for the welfare of agriculture. Dollar losses to agriculture as a result of air pollution are difficult to quantify. However, it is safe to say that, nationwide, it runs to tens of millions of dollars a year and possibly in the hundreds of millions of dollars per year when all aspects of reduced productivity are considered. We are also working to protect the health of farmers and their families through our pesticide control programs. Our efforts to stem the loss of good agricultural land by trying to discourage urban sprawl, our efforts to encourage good conservation practices to prevent top-soil runoff, our cooperation with the Forest and Soil Conservation Services, our programs to assure continuing flows of healthy, clean water for irrigation and for drinking—these are just a few of the ways in which our programs are benefiting farmers.

Q. Sometimes EPA and the Department of Agriculture seem to be in opposing camps. Is this seeming conflict inevitable because each represents a different constituency?

A. Some may see us on conflicting paths, but, historically, we not only have much in common, but we share similar tap roots that depend on unpolluted soil, water and air for continued prosperity. We need to recognize these common tap roots as we work together to develop practical programs. Most of the difficulties we have had were, in my judgment, caused by inadequate communication. I am convinced that while we may view environmental problems from separate perspectives, our goals are essentially the same.

Q. Should environmental objectives always take precedence over agricultural needs?

A. Although all our policies and programs are aimed toward achieving environmental protection, we recognize that we cannot blindly pursue them at the expense of other vitally important national goals such as agricultural productivity. What is good for the environment is usually good for agriculture and vice versa.

Q. Can you cite a specific instance where agricultural and environmental interests are in harmony?

A. Water quality problems which arise from agricultural runoff may be the result, at least in part, of poor conservation practices. I can think of few objectives which make more sense both environmentally and agriculturally than keeping our soil on the land. In an even broader sense, keeping prime agricultural land in productive agricultural use should be a high priority national goal upon which environmentalists and farmers alike should make common cause.

Q. Is there a danger that EPA enforcement of environmental regulations might cause a decline in food production?

A. Let me assure you that EPA intends to enforce environmental regulations in ways that will not cause unnecessary adverse impacts on food production. When signs of an approaching food crisis became apparent, we began a thorough study of food supply and demand and of the impact of our regulations on all phases of agriculture. Our soundings indicate that the world is experiencing its third period of serious food shortages since World War II. Unlike the previous two, this one may not end soon. The United States will continue to be by far the most important exporter of food.

Q. Do pesticides play a major role in maintaining U.S. food production?

A. There is no doubt about it. A Department of Agriculture survey in 1966 revealed that 85 percent of all farmers used agricultural chemicals for crop protection. Those farmers would suffer annual losses totalling \$2.1 billion if no pesticides were used, the National Academy of Sciences has estimated. I have been told that the domestic use of pesticides now amounts to almost one billion pounds of active ingredients a year, although less than half this amount is used on crops.

Q. How would you evaluate the risk of this enormous use of pesticide?

A. No matter how carefully one applies pesticides, there is always the possibility the material will enter our streams, rivers and lakes. Human health may be endangered. There is obviously a special hazard to frequent users—people engaged in production, distribution and sale of pesticides, people engaged in the application of these pesticides and the workers in the fields where pesticides have been used. So we must balance the risks of using pesticides against their benefits. It is the role of EPA to

assess the facts and to act positively through promulgation and enactment of rules and regulations.

Q. The human suffering caused by manufacture of the pesticide Kepone at Hopewell, Va. was a shocker and is still fresh in the public's mind. How do you assess this tragedy?

A. The events that occurred at Hopewell represent a human tragedy of major proportions. It serves to remind us that the use of toxic substances in our society inevitably carries grave risks with it. The Federal Insecticide, Fungicide, and Rodenticide Act requires the Agency to register pesticide products if it is shown that they will be effective and will not pose a risk of unreasonable adverse effects to man or the environment when used as directed.

Q. Does this Federal pesticides law give EPA any regulatory control over the premises or manufacturing processes for pesticides?

A. Although the Act requires that all pesticide producing plants be registered by EPA, our authority to inspect establishments extends only to pesticides which are "packaged, labeled, and released for shipment." The law does not regulate the working conditions in these plants, since that is the responsibility of other Federal agencies.

Thus, this law actually has limited applicability to the Hopewell situation. The human and environmental contamination surrounding the Life Science operation resulted from manufacturing and disposal operations rather than from the use of the pesticide under its EPA registrations. It could have been any industrial chemical involved; the fact that it was Kepone, a pesticide, is merely incidental since the problem was of a manufacturing and occupational exposure nature.

Q. Just what is Kepone—chemically?

A. Kepone is a chlorinated hydrocarbon pesticide which does not tend to cause immediate harm to humans upon contact. However, as with other chlorinated hydrocarbon pesticides, Kepone can have serious and undesirable long-term effects.

Q. What are some of the health effects produced by Kepone exposure?

A. It accumulates in human and animal tissue, and has induced tremors, hyperactivity, muscle spasms, and sterility in laboratory animals. And according to data from the National Cancer Institute, Kepone can cause certain types of cancer growths in test mice and rats.

Q. Did any aspect of the Kepone operation come under EPA regulatory controls?

A. The Life Science operation affected EPA's statutory jurisdiction in two other respects: the Clean Air Act and the Federal Water Pollution Control Act. The Life Science plant discharged its wastes to the Hopewell sewage treatment plant, which in turn discharges into the James River, thereby making it subject to the Virginia water pollution control program. The Virginia program issues and monitors discharge permits under a delegation of authority from EPA. Similarly, air pollution detection devices in operation near the Life Science plant were installed and operated by a State agency whose program EPA approved.

Q. Have we learned anything from the events at Hopewell, Va.?

A. We can learn from tragic incidents such as the one that occurred in Hopewell. While a misfortune of this magnitude is a terrible learning mechanism, we can at least take away from it insights which help to improve our ability to prevent such episodes or, at a minimum, to

respond more effectively when problems do arise.

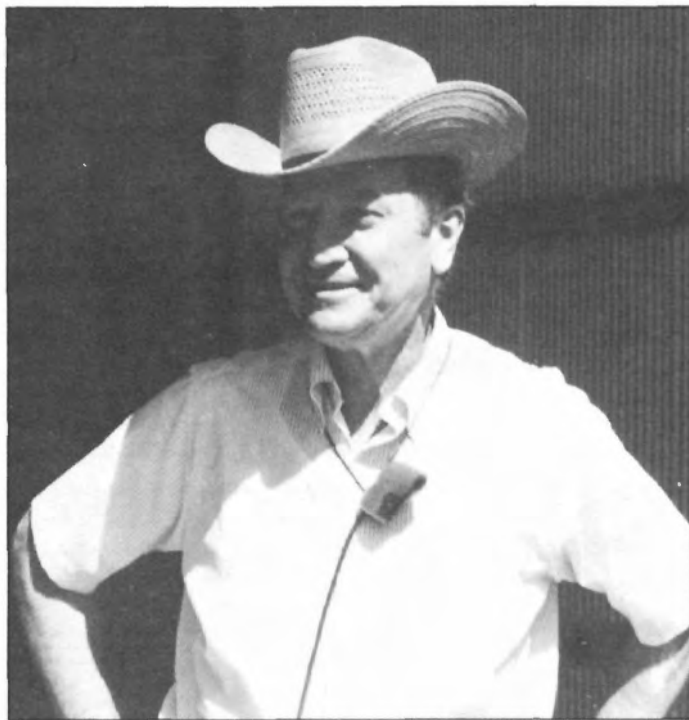
Q. What new programs or procedures have we initiated that might prevent the occurrence of a comparable disaster?

A. Because of Hopewell we have met with representatives of the Occupational Safety and Health Administration, the National Institute of Occupational Safety and Health, the Center for Disease Control, and the Food and Drug Administration to discuss better interagency communication and cooperation to deal with future incidents like this. We have started a formal information exchange to predict problems before they reach serious proportions.

We are also on the verge of signing a formal Memorandum of Understanding with the Occupational Safety and Health Administration which provides for quick communication of possible violations that are observed by either Agency's inspectors during plant visits. I have also directed EPA Regional Administrators to have our inspectors and enforcement personnel look for signs of adverse effects in water and air during their inspections of pesticide plants.

Q. Apart from the risk factor are there other limitations to the use of pesticides?

A. We are at the point in agriculture production where



Administrator Train wearing a farmer's hat while making a tour of the midwestern farm belt last summer.

additional amounts of fertilizer and pesticides can add little to food production but can add significantly to environmental problems. The National Research Council of the National Academy of Sciences recently reported that controlling pests with chemicals is becoming increasingly difficult, and serious problems will be posed for agriculture and public health unless alternative technologies are perfected. Over the years some pest species have developed a genetic resistance to pesticides, and, in many cases, natural balances have been disrupted, or entirely new pest problems have emerged as a result of pesticide treatments. This is why EPA is working with the Department of Agriculture on an integrated pest-management approach designed

to use all aspects of farm management rather than just chemicals to control pests.

Q. In the meantime, what are we doing to make use of pesticides safer and more effective?

A. We are extremely active in this area. The passage of the 1972 amendments to the Federal Insecticide, Fungicide, and Rodenticide Act of 1947 gave EPA broad new responsibilities. For example, by October, 1977, we must register, re-register and classify all pesticide products used in this country. We are also engaged in a major new program to certify applicators of pesticides. Another major thrust of our pesticide strategy is the establishment of a hazard-evaluation system to better understand the nature and extent of adverse effects of pesticides on man and the environment.

Q. How much of a threat to human health does modern agriculture's use of chemicals—pesticides—pose to human health?

A. We are very concerned about the human health aspects of pesticides. EPA's legislative mandate is to regulate these pesticides in a manner that will protect the environment, and most importantly human health. On the other hand EPA recognizes that pesticides are absolutely necessary to agriculture if we want to maintain the high degree of productivity the American farmer has achieved in recent decades.

Careful judgment must be exercised to assess and weigh the benefits and risks in order to achieve an effective balance. Pesticides pose unique problems. All are poisonous—although some are more toxic than others—and the large quantities used—almost 1 billion pounds a year—can have an important impact on the environment and our health. We are just beginning to understand the hazards posed by certain pesticides and evaluate the risks associated with their prolonged and widespread use.

When we talk about carefully weighing the risks and benefits of these compounds, taking into account economic, social, and environmental factors, we should remember that the benefits—the control of pests—are realized immediately and they can usually be calculated with relative ease. But environmental effects and human health

effects are more difficult to determine. For example, human health effects may not show up for years. The latency period in human beings of a cancer-causing chemical will usually be somewhere between 20 and 40 years. When an entire population is exposed, as is the case with dieldrin, with substantially everyone carrying measurable levels of dieldrin in his tissues, there is no practical way of relating specific human cancers to dieldrin exposure.

While seeking to protect public health against harm from pesticides, we also seek to strengthen the ability of the agricultural community to deal with pests, diseases, and other threats to their crops and our food supply.

Q. Was there any truth to charges made in some quarters last year that EPA and its 1972 ban on DDT were largely responsible for a major outbreak of encephalitis?

A. Absolutely not. First, DDT had largely been abandoned for mosquito control in the U.S. before the 1972 ban on DDT, because mosquitos had become DDT-resistant. Second, EPA's ban on DDT specifically excluded public health uses from the ban. Third, at least 10 products are registered and available for use against adult mosquitoes, including malathion, the product preferred by health agencies because of its superior knockdown power. Fourth, not a single health agency in the Nation requested the use of DDT in combating encephalitis.

Q. How do you think the new regulations for classing certain pesticides as "restricted" and requiring that only certified applicators can use them will affect American farmers?

A. Certification of pesticide applicators will help farmers. The restricted pesticides are dangerous. Many farmers, farm workers and members of their families could get sick—and even die—from inhalation or skin contact with them. Other pesticides can cause great damage to the environment if they are not applied directly to the crops or soils they're designed to protect and prevented from drifting into the air and washing into waterways.

I expect some farmers will complain about having to take a short instruction course or pass a test to be certified



to use products that they may already have been using for some years. But the instructors and certifiers will be people from their own State, extension agents usually. The requirements are flexible and adapted to the State's crops and farming conditions.

Farmers in general like to keep up with new technology, improve their methods, increase their profits. Pest control is a field that is constantly changing. The certification program will help farmers keep abreast of developments. It will be both action-forcing and technology-forcing; it will give a push to the development of better farming methods and better environmental protection.

Q. EPA has long considered that wastewater discharge permits could not be used to control pollution from "non-point" sources: farm and forest drainage for example. But the Natural Resources Defense Council sued in Federal Court and last summer won a court order requiring EPA to more carefully define "point sources" for certain agricultural and forestry operations, for feedlots, and for city storm sewers, and to develop new regulations for issuance of permits to these sources. What are we doing to obey the court order?

A. Everything the Court ordered. In November we proposed permit regulations for concentrated animal feeding operations—feedlots, poultry houses, and so on. In December we proposed regulations for storm sewers—city drainage systems not connected to sanitary sewers. In February we proposed regulations for some operations in forestry and agriculture.

We think these regulations will be workable, but we don't yet know whether the pollution reduction they could achieve would be worth the cost. That's why we didn't propose them before. We wanted to concentrate on the industrial and municipal point sources that have the greatest potential payoff.

In each instance we held a series of public meetings across the country to obtain views as to how sources of pollution should be defined and eventually brought under control.

Of course we will give serious consideration to all comments from the agricultural community.

One problem in agricultural and forestry operations is determining where the discharge can be measured and presumably controlled. Clearly, irrigated croplands could require permits because they have definite discharge points, but not land watered by rain or snow and drained by natural streams. In most agricultural and forestry operations, the situation is more complex since the abatement measures are generally management techniques which must be applied throughout a watershed. This is unlike abatement of municipal and industrial discharges where treatment can be provided at the discharge point.

We have taken the position that rain discharge is non-point even if it flows from a pipe. Only when man applies and controls water so as to cause a surface discharge of pollutants to navigable waters do we have a point source in agricultural or forestry activities. We also intend to issue "general" permits to allow those discharges to continue until locally developed areawide plans are completed or until we know there is to be a solution to a particular discharge. Then individual permits would be proposed containing specific limitations and corrective actions.

In general the new regulations would give us and the States flexibility to use the permit selectively and only on problems where answers exist.

For example: owners or operators of feedlots would continue to need a permit if they have a very large operation, such as over 1,000 head of beef cattle on feed or over 700 dairy cattle and discharge wastes to a waterway.

Smaller feedlots, say under 300 head of beef, would generally not be required to obtain a permit unless we visited the site and made a determination that the operation should and could be regulated under the program.

In any case, no permit would be required if there is no discharge of pollutants into waterways.

Q. What type of forestry operations might require discharge permits?

A. In forestry operations we feel the most logical pollution sources that are subject to such control are not tree-cutting or tree-planting at all. These activities come to mind when we think of forestry. They are watered by Nature, by rain and snow-melt, uncontrollably, and the discharges cannot reasonably be controlled with "end-of-the-pipe" technology. However, forestry requires building a lot of access roads that require gravel and timber storage areas. Therefore, rock crushing and gravel washing and log sorting which use controllable water and have distinct discharge points, are the kinds of activities we propose to regulate with discharge permits under the Court's order.

Q. Are we appealing to a higher court to get the non-point permit order reversed?

A. Yes. We have asked the Justice Department to appeal the ruling, and they have agreed to do so. General Counsel Robert Zener is working on the appeal briefs now and will help argue the case before the Federal Court of Appeals.

Q. Do you feel that Congress should amend the Water Pollution Control Act to provide authority for reducing pollution from areawide sources, such as agriculture and forestry?

A. No. We have adequate authority, and there is no technology for controlling runoff water from wide areas as there is for specific wastewater discharges from industrial plants or sewage treatment works.

There is no question but that natural runoff causes an awful lot of water pollution, but the best ways of reducing it are good techniques of land management. If farmers plow their land on level contours rather than up and down the hills, less topsoil and silt gets washed away. If they gauge carefully the amount of fertilizer they use, and apply it properly, they reduce the amount of nutrients that get into streams and lakes and cause eutrophication. Foresters and lumber companies likewise can do many things to limit the pollution runoff from their normal operations.

We are proposing amendments to the Water Pollution Control Act, but they deal with the funding of wastewater treatment grants, the criteria for eligibility, and so on.

Q. Will reduction of air pollution benefit agriculture?

A. We know that industrial pollution, particularly sulfur oxides from power plants, can have a very adverse impact on agricultural production. Recent studies on the effects of photochemical oxidants on agricultural growth have shown that the yields of alfalfa and sweet corn were reduced by 15 percent each when exposed to certain levels of these oxidants. Similarly, and more dramatically, bean yields were reduced 25 percent, and tomatoes reduced 33 percent.

Q. Strip mining for coal, power plant construction, and shale oil extraction have already begun in some of our Western States: Colorado, Montana, the Dakotas, Utah, and Wyoming. This is a land of ranches, farms, and small

towns. How will this development of energy resources affect the quality of life there?

A. It's having a very serious impact on the environment and on people's style of living. We are watching it very closely. Our Region VIII Office is "riding herd" on these strip mines and power plants to see that pollution control standards are maintained. We have many laboratory and field studies under way in this area.

About a year and a half ago I spent five days and covered almost 5,000 miles inspecting the energy development areas and talking with all kinds of people. I talked with ranchers and farmers, miners, public officials, company executives, reporters, environmentalists, and reclamation specialists. Some were afraid the development would sacrifice the West's land and water and clear air. Others thought environmental protection regulations were creating unreasonable obstacles to obtaining the energy the Nation needs.

During that trip I saw and visited strip mines, power plants, a prototype oil shale mine and extraction plant, and an oil field injected with water to increase production. I saw mined areas that had been regraded and planted. I saw boom towns and haphazard growth. I saw croplands, forests, wilderness areas, and Indian reservations.

I think this region is willing to share its resources, but with certain reservations. I agree with a 70-year-old rancher whose home rested on a rich coal bed. He said: "We know coal is going to be mined and I think we can face the fact. . . But we don't want to be deluged with it all at once. . . what we dread most is uncontrolled growth with no consideration. . . for the people who live and work here."

Energy development will inevitably involve some environmental costs. But we must keep those costs to a minimum. We must seek to avoid environmental damage that is irreversible and essentially permanent. And we must give highest priority to avoiding adverse impacts on public health.

Q. Water is a precious and scarce commodity in much

of the West. How will the larger water needs of energy development affect western agriculture and ranching?

A. Water consumption is only one of the environmental aspects that EPA and the States are watching closely. The high cost of water for industrial uses in the West will undoubtedly encourage conservation and reuse wherever possible. It will also spur the development of methods that require less water for any given process.

Simple economics will be working for us in this case, and you must remember that the arid Western States have long-established laws and customs concerning water rights and water use—local controlling mechanisms that seem quite strange to an Easterner accustomed to about 40 inches of rainfall a year.

Q. I understand that as well as being the Administrator of EPA, you are a part-time farmer on Maryland's Eastern Shore. What do you grow?

A. I cultivate a little over 130 acres, primarily planted in feed corn and soy beans. I also raise a small amount of hay to feed two horses. We rotate the crops and try to follow the best land management practices we can, such as maintaining grass strips to help control runoff.

I operate the farm on shares with my neighbor, Earle Harrison, who provides the equipment and the know-how. I don't pretend to much expertise! I have tried to help the quail population by planting feed strips and have also planted hedgerows to provide cover for birds and other wildlife.

We have a vegetable garden and fruit trees, and my wife Aileen preserves quantities of food which we use all year. There is considerable woodland on the property and a resident population of deer. And, of course, being on the Eastern Shore, we have great numbers of waterfowl in our fields and along the shore in the winter months. We are lucky to have oysters and crabs which we also harvest for our own use.

Each season brings its own rewards and pleasures. I can't pretend that the farm is a great financial success but it is fun and satisfying to try to use the land itself. □



TESTING CHEMICALS, NOT PEOPLE

(Excerpted from remarks made by Administrator Russell E. Train at the National Press Club, Feb. 26, 1976. Copies of the full text of this speech can be obtained by writing the Public Information Center (PM-215), EPA, Washington, D. C., 20460.)

“Let me highlight some of the most important points we should keep in mind about chemicals and their effects upon human health and life:

“1. Over the past few decades, and especially since the end of World War II, we have released into the environment a vast volume of entirely new chemical compounds with little or no knowledge of their health effects and virtually no effort to determine those effects and to regulate the release of many chemicals that might be hazardous.

“2. We have reaped enormous benefits from these chemicals—indeed, from the truly marvelous advances in chemical knowledge and technology that we have achieved throughout modern times. We must measure these benefits, not only in the economic terms that are apparent to us all, but in health terms as well. The fact that we are the first generation in human history to be virtually free of the major infectious diseases is, in no small degree, a result of the application of chemical advances to modern medicine and modern life.

“3. The World Health Organization estimates that between 60 to 90 percent of all cancers are the result of environmental factors—in the broadest sense of that phrase. National Cancer Institute studies have shown that the highest cancer rates in the country occur in areas with the heaviest concentrations of industrial chemical use and activity. Yet of all the chemical agents in the environment, probably only a very small fraction is responsi-

ble for that large share of cancer. Indeed, the odds are that only a relatively small portion of the chemicals in our environment pose any serious health threats.

“4. It may take only limited exposure to contract cancer. It typically takes anywhere from 15 to 40 years after that exposure for the first onset of cancer to occur. Because of that long latency period, we have reason to believe that the full impact of the chemical explosion we have experienced over the past 30 years has only begun to show up in our cancer statistics. Yet already, the experts tell us, one out of every four Americans now alive will ultimately contract some form of cancer.

“5. A large and growing share of the diseases that cripple and kill us are caused by environmental factors—again, in the broadest sense of that phrase. These diseases are going to take an increasingly heavy toll upon our lives and well-being, unless and until we stop trying to deal with them by treating them after they occur, and start taking serious steps to prevent them from occurring in the first place. Our national health care effort must increasingly stress the prevention rather than the treatment of disease, and effective measures for the assessment and control of potentially dangerous chemicals and other agents *before* they enter the environment must be a key element in this new shift toward preventive medicine.

“To expand on these points: There are today more than 2 million different known chemicals; every year, this list grows by an estimated 25,000 new compounds. There are today more than 30,000 chemicals in actual commercial production; every year, this list grows by some 1000 new compounds. Of the more than 2 million known chemicals, only a few thousand have been tested for carcinogenicity and—aside from those used in food additives, drugs and pesticides—only a few hundred have been adequately tested. We know, in fact, very little about the health effects even of the 30,000 chemicals already in commercial production. We have no way of systematically screening the chemi-

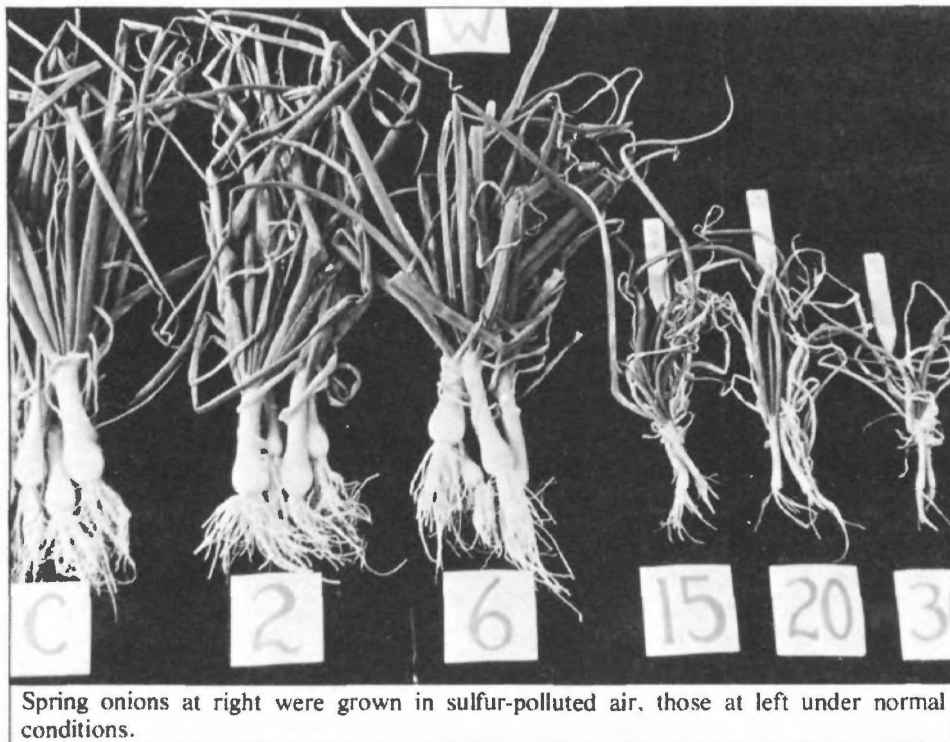
icals that do go into production; we have no way of knowing precisely which chemicals go into production every year. In other words, we not only don't know whether what's going out there is dangerous—we don't even know what's going out there.

“We have, however, learned one thing: it's what we don't know that can really hurt us, even kill us.

“When I became the first Chairman of the Council on Environmental Quality in February 1970—almost exactly six years ago—my very first directive to our staff was to develop a legislative proposal for coping with the class of problems presented by chemical and other contaminants. A year later, in February 1971, this legislation, known as the Toxic Substances Control Act, was submitted by the President to the Congress. Twice, over the past five years, the Senate and the House have passed versions of this legislation, but have been unable to agree on the same version. Last week, the Senate Commerce Committee reported out Toxic Substances Control legislation for action by the Senate. In the House, the legislation is being considered by a subcommittee of the Interstate and Foreign Commerce Committee.

The plain fact is that, had the Toxic Substances Act been enacted five years ago when it was first proposed, we would be a lot farther ahead in dealing with some potentially very serious hazards.” □

AIR POLLUTION ON THE FARM



EPA scientists are operating a small, intentionally air-polluted farm at Corvallis, Oregon, as a research project which may help save farmers money.

They raise their crops under plastic tents filled with controlled amounts of common air pollutants. Then they measure the effects on plant growth, soil ecology, and crop yields.

This research may lead to the saving of many millions of dollars a year for American farmers, according to Dr. Lawrence Raniere, Chief of the Terrestrial Ecology Branch at the Corvallis Environmental Research Laboratory.

The work involves not only plant scientists but also a systems analyst, a biomathematician, five biotechnicians, and a mechanical engineer. On their four-and-a-half-acre site—part of Oregon State University's Hyslop Farm—they are learning the mechanisms by which air pollutants can limit the natural production of nutrients in the soil, slow down the normal decay of organic matter, and stunt plant growth.

Such knowledge is necessary before meaningful air pollution control meas-

ures can be undertaken. It is also needed for more accurate assessment of the economic losses to agriculture from air pollution. Direct losses to crops are estimated to exceed \$150 million annually, and indirect losses are believed to be much higher.

Outdoor Laboratory

The EPA farm provides an outdoor laboratory more closely approximating real farming conditions than the bench tests of plant growth that are usually employed.

Plots of field crops—corn, alfalfa, soy beans, and sugar beets—are grown under clear plastic sheeting, using normal methods of planting and cultivation, natural soils and sunlight, and simulated rainfall.

Lettuce, radishes, onions, and other garden crops are also grown on the leased site.

Air under the plastic canopies can be varied as desired, with controlled amounts of such pollutants as sulfur dioxide, a pollutant discharged by power plants and industries; ozone,

the main constituent of smog; and particulates containing metallic compounds and sulfates.

All of these pollutants affect plant growth in various ways, and these effects are observed throughout the plant's growing cycle from seed germination to harvest. Effects of the pollutants on the soil ecosystem and the interaction with plant root systems are also observed in the test plots.

3 Significant Effects

Preliminary results of these research programs show three very significant effects:

1. Air pollution can severely limit the natural conversion of nitrogen in the air to fixed nitrogen compounds that are the principal nutrients of plants. This fixation of atmospheric nitrogen is Nature's way of making fertilizer and is accomplished by bacteria that grow on the roots of certain plants, called legumes. Alfalfa and soy beans are legumes widely planted for their ability to improve soil fertility as well as for their values as crops.

Nitrogen conversion by alfalfa was reduced 40 percent when the crop was exposed to ozone, even at levels well below the national air quality standards. Sulfur dioxide also reduced nitrogen conversion by alfalfa when the concentration of this pollutant gas exceeded .06 parts per million.

2. Certain heavy metals that occur in airborne particles also inhibit nitrogen conversion. One of these is cadmium, a metallic element of no known nutritional value and many toxic effects. Red alder trees exposed to cadmium compounds in air produce less nitrogen in their roots. Airborne cadmium compounds are produced by automobile exhausts, tire wear, coal-fired power plants, and the manufacture of phosphate fertilizers.

3. Cadmium and selenium particles slow down the rate of decay of soil litter, the essential biological process by which dead organic matter is made available for plant use.

Acid Rain Studied

Acid rain—an indirect effect of air pollution—is also being investigated at the test farm. Rain that carries dissolved acids is increasing throughout the world in both extent and severity, said Dr. Raniere. It is caused chiefly by the conversion in air of sulfur oxide gases to sulfate particles, which



Plastic tents enclose test crops on EPA's 4 1/2-acre farm, where effects of polluted air on field crops and trees are measured.

then combine with rainwater to form dilute sulfuric acid. Various metallic compounds also add to the acidity.

Research is under way at Corvallis to determine the effects of acid rain on plant growth and plant-soil ecology over a three-year period. Simulated rain containing various amounts of acid is applied to test plots for three or four hours three times a week, while scientists measure nutrient washout, nitrogen conversion, organic decay, and the rate of nutrient absorption by the plants, as well as overall crop production.

Results of this work are expected to provide a sound basis for plans to control airborne sulfates on a regional level in the future.

The Corvallis group is also working to improve their techniques of measuring air pollution damage to plants. Up to now such damage has generally been based on observation: spotted leaves, wilting, and so on. These methods are subjective and difficult to standardize.

Damage Indicator Found

The scientists have found a more sensitive method, which seems to indicate incipient damage before it becomes visible. In the normal course of the research, plants are given a kind of "basal metabolism" test. That is, all the gases the plant "inhales" and "exhales" are carefully measured. These are mostly carbon dioxide, oxygen, and water vapor, with small amounts of other substances. One of the minor gaseous products is ethylene, a hydrocarbon. Ethylene output has been found to correlate with ob-

served plant damage, and it rises when the plant is exposed to air pollution, before visual damage is apparent.

The Terrestrial Ecology Branch has other plant pollution research under way, involving field work in Montana, southern California, and Florida.

In Montana, grasslands in the vicinity of new coal-fired power plants are being studied to learn how stack emissions and cooling systems affect the

native plant and animal life. The objective is to develop predictive guidelines for the siting and management of future power plants. The project is to be completed in 1978.

In the San Bernardino National Forest in southern California, a three-year study of smog damage to ponderosa pines is being sponsored jointly by EPA and the U.S. Forest Service.

In Florida, a recently completed study focused on the effects of sea-salt drift from an evaporative cooling system. A proposed nuclear power plant near Homestead, Fla., will cool its heat exchangers with seawater and then cool the seawater in an evaporative system, discharging large amounts of sea-salt particles. The EPA scientists exposed different types of vegetation to the expected salt concentrations to determine long-term growth effects and salt tolerance levels.

Corvallis researchers are also using radioactive trace elements to follow the movement of chemical pesticides through soil, plants, and animals. In this way they hope to learn more about how and where pesticides are stored and how they change and decay. Such information is needed by both pesticide manufacturers and users in assessing a product's environmental impact. □



Model ecosystem in Corvallis laboratory tank contains a variety of plant and animal life, and movements of pesticides can be traced through all parts of the system. The observer is Jay Gile, research biologist.



TAMING THE PEST KILLERS



REREGISTRATION

During the next year and a half every bug spray and weed killer, every rat poison and flea collar, sold in the United States will have to be reregistered by the Office of Pesticide Programs.

About 35,000 different products registered under the 1947 Federal pesticides law before August 4 of last year are involved, plus approximately 7,000 products made and sold within States and not previously subject to Federal control.

The old law's criteria for registration were safety and effectiveness. The law's 1972 amendments and subsequent EPA regulations provide three new label requirements:

- Classification of each pesticide for "general" or "restricted" use;
- Better presentation of warnings and directions for use—and for storage and disposal too—on each product's label; and
- For certain unusually hazardous products, the minimum time that must elapse before farm workers can enter a field where the product was applied.

Moreover, additional scientific information on toxicity to humans and to fish and wildlife will be required for many products before they can be reregistered.

Massive Job

"We have begun the massive job, and we are confident it will be done before the Congressional deadline of Oct. 21, 1977," said Edwin L. Johnson, Deputy Assistant Administrator for Pesticide Programs.

"To assist the industry in complying with the new requirements, we held a series of question-and-answer workshops around the country this past summer and fall. These were well attended and received.

"And we have set up procedures to expedite the process by reregistering products in 'batches' according to their active ingredients. For example, all iodine products will be batched together, or all products containing copper in a certain range of concentration."

A prime feature of each reregistration will be its classification for "general" or "restricted" use. General-use pesticides are those not considered dangerous when used according to label directions. They will be available to everyone.

Restricted-use pesticides are those considered dangerous to man or to the environment unless they are used by competent people. After Oct. 21, 1977, only certified applicators, or persons working under the direct supervision of a certified applicator, will be able to use restricted pesticides legally. (See certification story on page 6.)

Many pesticides now being sold are expected to be reregistered quickly on the basis of scientific data already in EPA's files. Others, for which long-term effects are not yet known, may be reregistered temporarily, pending completion of the necessary studies.

1,505 Ingredients

A list of 1,505 active ingredients of pesticides was published in the Federal Register for Feb. 17, taking up 158 pages of the Register. The ingredients were grouped according to chemical similarity and relative knowledge of their health and environmental hazards. Broad uses for each were identified, i.e. for insect, fungus, or rodent control, etc., and "data gaps" were indicated where more information is needed on the chemical's effects.

The Federal Register notice set a timetable for the "call-in" of reregistration applications for products containing 651 of the ingredients, 144 of them before July of this year. More than half of the 1,505 chemicals have not yet been categorized by EPA.

The Office of Pesticide Programs will announce later a list of active ingredients presumed to be too hazardous for reregistration. Items on this list are expected to become the subjects of many EPA-industry conferences and public hearings.

As batches are called in for reregistration, EPA will send applicant industries and distributors "specific guidance" packages that include: required label changes, references to

supporting data, indications of additional data needed, possible waivers of data requirements, and a proposed general or restricted classification.

Registrants have 60 days to respond; otherwise their product registration may be cancelled.

Reregistration Team

John B. Ritch, Jr., directs the Pesticide Office's Registration Division. He is assisted by a 15-member task force drawn from all parts of the Office and 15 product managers to handle the details.

EPA is encouraging applicants for reregistration to cooperate in compiling data on safety, effectiveness, toxicity, and environmental effects, according to Deputy Assistant Administrator Johnson. This can help the pesticide companies by spreading research costs over two or more firms, he said, and it can also help EPA in processing the batches of applications more rapidly.

The Pesticide Office depends principally, but not entirely, on scientific data submitted by manufacturers from their own research or from data obtained from universities and private organizations.

Backup Testing

The Office's Chemical and Biological Investigations Branch, headed by Ronald A. Davis, can play a crucial backup role in the reregistration process whenever EPA officials have reason to question the submitted data.

The Branch can evaluate all kinds of pesticides for chemical and biological activity, tasks it usually undertakes for pesticide accident investigations and for research to support enforcement actions, rather than product registration.

The Branch has a professional and supporting staff of more than 70 persons and has laboratory and field operations in Beltsville, Md.; Corvallis, Ore.; and Bay St. Louis, Miss. The staff includes specialists in poisons, viruses, microbes, insects, plants, and animals. □



TAMING THE PEST KILLERS



CERTIFICATION

A Georgia farmer uses parathion to kill insects that infest his cotton and peanuts. An Iowa grower uses toxaphene on his corn and methyl bromide to fumigate his storage bins.

Each has only two more growing seasons before he must prove himself competent to use these chemical pesticides, which are extremely hazardous. Parathion and methyl bromide are poisonous to inhale or to touch; masks and protective clothing are needed. Toxaphene is poisonous to fish; it should be used only when it will not wash away into a stream or lake.

These three chemicals seem certain to be on EPA's list of "restricted" pesticides, which, after Oct. 21, 1977, can be used only by certified applicators (or persons under their direct supervision.)

The States will administer the certification of private applicators (farmers) and commercial pesticide applicators.

Plans on Schedule

State certification plans are progressing about on schedule in spite of a recent one-year extension by Congress of the effective deadline, according to Edwin L. Johnson, Deputy Assistant Administrator for Pesticide Programs.

By the end of February, six States' certification programs had received final EPA approval. Four more had been formally published, with notice of EPA's intent to approve; six States and Territories had plans signed by their respective Governors; and three were awaiting their Governor's signatures.

Mr. Johnson said the extension of the deadline from October of this year to October 1977 has not caused any noticeable delay in certification efforts by the States. Moreover, most States indicate that they intend to proceed with applicator training schedules developed before the extension voted last November when Congress amended the Federal Insecticide, Fungicide, and Rodenticide Act.

Under the Act, certification will be required only for restricted pesticides, those judged by EPA to be the most dangerous either to the environment or to the health of persons who handle and apply them. Such restricted pesticides would be sold only to persons certified to be capable of using them safely. And they will have to be used only by certified persons or by employees working under their direct supervision.

EPA has not yet announced the restriction of any pesticides, but last year the Office of Pesticide Programs issued a list of 41 "presumptively restricted" types of chemicals. This list is being used in the development of training materials and planning of certification programs.

General-Use Products

Most pesticides, and especially those used in home yards and gardens, will be classified for general use, and no certification will be required to apply them. A presumptive list of 76 general-use pesticides was also issued last year. Some of the chemicals presumptively restricted may be downgraded in the final list and classified for general use; others may be rated general-use in certain formulations and below certain concentrations.

Complete safety is not assured by a general-use rating, however, Mr. Johnson emphasized. Label directions must be followed. EPA does not register any pesticide unless it is properly labeled with directions for use and with adequate hazard warnings.

The certification process for applicators of restricted pesticides will vary from State to State according to varying pesticide use patterns, types of pests to be controlled, and local regulations. Each State will administer its own certification program after its plans have met EPA's standards.

The State determines when a person is competent to use the restricted pesticides, and it can choose from a number of ways to determine competence of private applicators, including formal written tests, completion of approved training, oral examinations,

even practical demonstrations. All commercial applicators must pass written examinations.

Training Courses Set

Training will be offered by State agricultural extension workers, health department experts, or industry groups. Some States may provide for home-study courses by mail.

Commercial applicators are expected to need from 8 to 12 hours of instruction and demonstration time, and individual farmers from two to four hours, to meet the competence requirements.

Farmer training is being conducted largely by extension service officials, under agreements worked out by EPA, the Department of Agriculture, and the States.

Training materials, pamphlets, and visual aids have already been developed under contracts funded jointly by EPA and Agriculture. More than \$1.2 million has already been spent on developing and distributing such educational materials.

Georgia was the first State to have its certification program approved last August. It was followed by Iowa, South Carolina, Wyoming, Mississippi, and Washington.

Washington, Oregon, and Idaho are planning identical performance standards, training materials, and commercial applicator requirements so that any person certified by one State automatically qualifies in the other two. New Jersey, West Virginia, Oregon and Idaho have submitted their plans and EPA has published its intent to approve.

Signed by their Governors but not yet published are the plans for Arkansas, Florida, Guam, Hawaii, Indiana, Maine, Maryland, Michigan, Montana, Nevada, New Hampshire, North Carolina, Pennsylvania, Puerto Rico, Tennessee, and Virginia. Plans for Arizona, Minnesota and New York await their Governor's signatures. □

Black Creek Story

The program described in the Black Creek story should help point the way for many other projects needed to help control pollution from "non-point" sources such as rain runoff from farm fields. EPA is now actively encouraging areawide planning and management by State and local Governments to help curb water pollution from both these nonpoint sources and from industries and cities.

Saving the Water by Protecting the Land

Allen County in far northeast Indiana is an area of vast, unspoiled farmland. The skyline is free of smokestacks, the air clear of industrial grime and soot.

Yet Allen County is a polluter. The Black Creek, a tributary of the Maumee River which flows through the county, is a murky brown, painted by the fertilizers, pesticides, herbicides, construction activities, and industrial pollution which wash down with the soil and damage the quality of the water and the life it supports.

In January 1972 Congressman Edward Roush (D-Ind.) held a conference in Fort Wayne, the County's largest city, to discuss the fate of the Maumee River and the basin it travels through. The conference concluded that agriculture was killing the Maumee, yet these conclusions were largely unsubstantiated.

Since Allen County has the largest agricultural area in the State, this conclusion upset many of its residents.

"We were shocked," said Bill Sweet, Allen County surveyor, "and we decided to do something about it."

In May, 1972, Sweet and Sam Evans of the State Soil Conservation Service set up a two-day workshop to discuss their problems. Among the participants was Carl Wilson, of the U.S. Environmental Protection Agency's Technical Support Section in Region V.

"They had some good ideas so I told them to submit a grant application for sediment study," said Wilson who grew up in New Mexico and Texas and has a background in farming and ranching. He is also a professional soil scientist. This "farmer in a double knit suit" is a city-smart country

boy who fits right into every aspect of the project.

Wilson's suggestion, plus a key response from Ellis McFadden, chairman of the board of supervisors of the Soil and Water Conservation District, was the start of the Black Creek Study, a five-year, \$2.5-million project funded by EPA Region V to study Allen County's soil erosion problems. The project, which incorporates the work of EPA, the Soil Conservation Service, Purdue University, the Allen County Soil and Water Conservation District, and a group of concerned farmers, is the only study of this kind on land management practices as they relate to water quality.



Rocks have been placed along the banks of this stream to reduce erosion and washing of mud into the Black Creek watershed.

An initial grant of \$33,000 from EPA covered the first six months of the project, the planning stage. A Purdue sociologist conducted a survey of the 170 land owners in the area to learn their attitudes toward conservation in general and their opinions on who should have what roles in the project. Partly as a result of this kind of concern, 80 percent of the farmers in the area are expected to participate in the Black Creek Study.

For the testing and evaluation phases of the study, EPA has provided \$1.8 million, and the Allen County Soil and Water Conservation District has contributed \$70,000.

The remaining \$400,000 will come in payments and in services from the farmers. EPA pays through a cost-share plan. Thus, for any given land management practice, the EPA absorbs about 75 percent of the cost and the farmers account for the difference. As land management programs go, this is a generous plan; most programs absorb only 40 to 50 percent of the cost with the farmers paying the rest.

A significant fringe benefit of this plan is the cooperation it fosters among the participants. And cooperation is what makes the Black Creek Study work.

Project director Jim Lake, a 25-year-old Purdue graduate, has the job of coordinating all this cooperation. He must organize the many available services offered by the program into one comprehensive package.

Much like a watchmaker, Lake takes many quality parts, assembles them into a timepiece and makes sure it's kept up to the minute.

Ralph Christensen, grant administrator of Region V and controller of the purse strings of the project, feels that Lake is handling the money wisely: "The communication and cooperation are what has made this project successful."

The farmers themselves are probably the most important people in this story. The statement that agriculture was killing the Maumee bothered them because it implied they weren't concerned with their environment.

"We've got a chance now to prove that pollution is not just from the farm and barnyards," said Dick Yerks, one of the participating landowners.

Farmer Chris Roemke has the same idea; "This project can prove to other people that we care about conservation and about protecting our soil for future generations."

Landowner Kenneth Schiatter said, "I'm not doing this for me." He is a third generation farmer on the soil his grandfather worked, and his son Steve already works with him.

Although 80 percent cooperation in a project like this is a remarkable figure, the farmers aren't surprised.

"You'll find a farmer cooperating provided he has a fair return on his farm. If he makes a decent living he won't hesitate to spend some money," said Chris Roemke.



The banks of this small stream which runs under the bridge at left center have been sloped and planted with grass. Fencing has been erected to prevent the cows from damaging the fragile banks.

And these people are spending; they have already raised \$60,000. The project guidelines not only have them investing money but making sacrifices such as not planting in certain areas to preserve the land. Idle land costs a farmer money.

Virgil Hirsch has a sediment basin that used to be good farm land, and yet he says he's glad he went along with the project because he feels it's worthwhile.

But he adds, "If they'd waited on me to come to them, why, it never would have got done."

Although each of the participants has his own role in the Black Creek Study, when the farmers think of the project most of them think of the Soil Conservation Service. The SCS works with the farmers on a day-to-day basis, advising them which conservation technique would work best on their land.

Purdue University has been measuring the effect of the land management practices in terms of erosion, biology, water quality and other aspects.

The final results of the Black Creek Study can be as far reaching as a change in conservation. If that happens the farmers of Allen County will be very much responsible.

Ralph Christenson's perspective is this: "Ordinarily you talk to a man and say, 'Look, fella, if you don't clean up, you're gonna get slapped with a fine.' We're saying 'Let's see what land management practices do to prevent pollutants from running off into the stream, what these practices cost in terms of dollars and production, without having a bunch of lawmakers doing it and making you pay for it.'"

"After all, no farmer wants to be told how to farm," said Carl Wilson.

The Black Creek Study has done

much to bolster the image of all its participants, especially the EPA. McFadden remarked that "before this project, EPA was going to close everything down. EPA was . . ."

McFadden stopped a moment and said, "But now, well, they've certainly won our respect."

The Environmental Protection Agency hopes this kind of project can be applied to other areas in the Great Lakes Basin since the 12,000-acre Black Creek watershed was not chosen at random. The basin contains almost every type of soil found in the Maumee River Basin, so practices proved successful locally can be applied regionally. □

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Curbing Feedlot Wastes

By Rowena L. Michaels*

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Agriculture is the economic base upon which the four States in Region VII, Iowa, Nebraska, Kansas, and Missouri, thrive and prosper. Gross farm and related agribusiness income totals nearly \$45 billion per year. Forty-three percent of the Nation's beef and 44 percent of its pork comes from this Region.

This high productivity is made possible by the centralization of animal feeding in very large lots. Since World War II the size of feedlots has steadily increased until today it is not uncommon for one operation to handle 100,000 head of cattle for about 120 days of feeding.

Although economically profitable, this centralized production of feed animals contributes heavily to environmental pollution, both of air and water, because of the huge amounts of wastes generated. The size of the problem is suggested by the fact that a 10,000 head of cattle feedlot, not considered a "large" operation in this part of the country, produces about 100,000 tons of manure annually. A feedlot with 50,000 head has a disposal problem comparable to that of a city of about 600,000 people. The Department of Agriculture estimates that animal production results in two billion tons of waste annually.

Until comparatively recent times, disposal of animal wastes posed no particular problems. American agriculture was widely dispersed, most farms were modest rather than large, and animal wastes were returned to cropland or pasture as fertilizer. Then around the turn of the century, when feedlots began to appear in the corn-belt States they were comparatively small operations, feeding between 100 and 300 animals, owned and operated by individual farmers.

Little concern was given to the control of wastes since the lots were frequently located on hillsides to take advantage of natural drainage and with

the assumption that a good rain would flush away the solids and the runoff would carry wastes into convenient streams. Approximately 80,000 of the country's 170,000 beef cattle feedlots are located on streams, so much of the muck has found its way into our waterways.



The increasing size of the feedlots, and the consequent increase in the amount of wastes to be managed, have overloaded the capacity of natural systems to safely dispose of them. In the mid-1960's water pollution caused by rainfall runoff from concentrated cattle feeding operations was the cause of major fish kills in this region.

Recognizing the magnitude and visibility of pollution caused by huge feedlots and the growing public intolerance of environmental abuse, Congress gave EPA responsibility for regulating wastewater from feedlots late in 1972. The Federal Water Pollution Control Act Amendments of 1972 included "concentrated animal feeding

operations" in the definition of "point sources" of water pollution. And "point sources" were required to file for a permit from EPA to discharge pollutants to streams and rivers. On December 5, 1972, the first proposed regulations were issued dealing with point sources under the Federal wastewater permit program. That first proposal was all inclusive. Nearly every farmer in the country would have been included. Here in Region VII we were accused of "planning to put a treatment plant on the tail of every critter."

The hue and cry that was raised by farmers and stockmen led to a reappraisal of EPA's position. Agency staff was sent into the field, advice was solicited from other agencies, comments from farmers and feeders were read and carefully studied. On July 5, 1973, we issued new regulations for the livestock feeding industry that covered only large feedlots, those confining over the "magic" 1,000 head size or equivalent, and certain others that were identified as significant contributors to pollution.

But as we set about implementing the new regulations, the Natural Resources Defense Council filed a lawsuit objecting that EPA had incorrectly excluded certain point sources from regulations. A U.S. District Court of Washington, D.C. ruled against the Agency in June 1975. The court decreed that we could not exclude any point source. It seemed that we had come full circle. To explore the options left, EPA held extensive public hearings at which livestock organizations, agricultural colleges, and individual feeders among others had an opportunity to be heard.

As a result new regulations for concentrated animal feeding operations have been hammered out and were promulgated in final form last month. In these regulations, EPA is attempting to aim the permit program at large feedlots that discharge wastewater and only at the smaller ones that may cause particular pollution problems.

Meanwhile, the States are also becoming more active in the feedlot waste control efforts. Kansas knew it had a problem as early as 1958. It took 10 years to get regulations on the books that Kansas felt would adequately protect water quality and control air pollution, odor and other feedlot nuisance problems. Iowa came up with regulations in the middle to late 1960's and by 1970 seven States had developed and adopted such regulations. These States work closely, as does EPA, with land grant universities, agricultural consulting engineers, and the Extension Service to help

solve the farmers' and feeders' problems.

Livestock waste management is difficult because of many factors: the size of the operation, availability of land for waste disposal, climatic conditions, and even changes in the agricultural industry itself. The trend in the livestock industry today is to view animal wastes not just as a product to be disposed of, but as a resource to be used profitably. Recognition of the nutrient value of animal wastes is increasing as commercial fertilizer prices continue to rise.

Current research, much of it funded

by EPA, emphasizes recycling of manure. Some cattle wastes are being converted into methane gas and other products. A project is being conducted at EPA's Robert S. Kerr Laboratory in Ada, Okla., to determine how much of the protein-rich dried manure can be included in the feed given cattle. At least one of the nation's large beef cattle feeding companies has already started to include in the normal diet of its herd substantial portions of feed derived from cattle manure. □

Feedlot near Omaha, Nebraska.



REGION IV ON PARADE

Geographically, the eight States—North Carolina, South Carolina, Georgia, Florida, Tennessee, Mississippi, Alabama and Kentucky—comprise 10.2 percent of the United States. Their population of 31,850,000 accounts for 15.7 percent of the Nation's citizens.

The Region is an area of great diversity and richness of natural resources. Some of these resources, notably woodlands and plenty of fresh and salt water, have drawn textile mills, pulp and paper mills, chemical plants and an ever burgeoning tourist trade.

The coming of new industry and new people has presented the Region with environmental challenges and continuing pollution problems, which, here and there, have tarnished skies and waters.

EPA was only eight days old on Dec. 10, 1970, when Administrator William D. Ruckelshaus came to Atlanta and let the Nation know that the fledgling Agency meant business in its mandate to protect the environment. Foregoing the usual platitudes in an address to a meeting of the Nation's mayors, he informed chief executives of Atlanta, Cleveland and Detroit that their cities were bounded by foul waters, and they had 180 days to get going on programs to clean up these waters.

The result, after sputterings and angry retorts abated, was launching of \$1.2-billion Federal and local programs to curb the pollution of Georgia's Chattahoochee River, Lake Erie, and the Detroit River.

Another big plus for EPA in the Region occurred on Nov. 18, 1971, in Birmingham when the city had a frightening air pollution episode. County and State were powerless to act, and industries at the time declined to shut down voluntarily. EPA teams from Region IV and Raleigh-Durham went into the Alabama city and for the first time put into operation emergency powers of the Clean Air Act. Working with the Justice Department, EPA got injunctions to close down 23

of the city's largest industries at a 2 a.m. hearing at the home of U.S. District Judge Sam Pointer. Air over the city, nudged along by a cleansing cold-front rain, cleared within 18 hours.

In the water area, Escambia Bay at Pensacola has been the Region's best known success story. Once one of the Gulf of Mexico's finest fishing and spawning waters, Escambia had been turned into the country's number one fish kill site in the late 1960's by the post-World War II influx of chemical plants.

The Region responded to this problem with a series of State-Federal enforcement conferences in the late sixties and early seventies which laid down some tough, effective cleanup



Modern Atlanta's skyline.

guidelines. Regional Administrator Jack E. Ravan followed this up in 1972 by stationing a team of marine biologists and engineers at the bay on fulltime assignment as monitors. Thanks to continuing progress in controlling harmful discharges, there were no recorded fish kills in 1975 and the monitoring team has been reassigned to other cleanup duties.

Those are some of the highlights. In the day-to-day struggle, some of the programs shape up as follows:

Drinking Water Safety

A comprehensive evaluation of the Tennessee water supply program in 1971 was the first such study in the Nation. Region IV has continued to lead the way, having also completed, at State request, evaluations of the Kentucky, Georgia, and Florida programs. However, a great deal of additional research is needed in water supply and related health effects studies. As a follow-up to the National Organics Reconnaissance Study, Region IV is investigating further the sources of the relatively high levels of trace organic compounds found at Miami, Fla., and Charleston, S.C.

Pesticides

Another first here—Georgia was the first State in the Nation to obtain an approved plan for the training and certification of restricted-use pesticides applicators. South Carolina was third, Mississippi fourth, and the remaining Region States are well along in processing or plan preparation. This is good because the Region has some major pesticide and pest problems. In Region IV some 1,378 registered pesticide manufacturing establishments (23 percent of the Nation's total) produce more than 7,000 products. Federal-State cooperation, as in other programs, is necessary to avoid duplication of effort and to uniformly regulate the marketing and use of pesticides. Resident pesticide inspectors are in the fields in Alabama, Florida, Mississippi, Tennessee and Georgia. These EPA representatives help train State pesticide inspectors, inspect manufacturing facilities, investigate pesticide incidents (some 150 last year), monitor experimental pesticides, and collect evidence to determine compliance with the Pesticides Act.

Air

Some 23 Air Quality Maintenance Areas have been formally designated in Region IV, and 31 counties are being given special study because they may not meet air quality standards. When the analysis is completed this spring, appropriate strategies will be determined for dealing with these problems. In some cases, this will involve more thorough enforcement of existing implementation plans; in other cases, additional control measures will have to be provided in revision of the

plans. In addition, special studies are being made of transportation-related pollutants in five urban areas: Atlanta, Charlotte, the Kentucky suburbs of Cincinnati, Louisville, and Tampa. The spectacularly dirty air of cities like Birmingham and Chattanooga, it is hoped, is a phenomenon of the past, but Region IV still has problems with industrial air pollution. Principal sources are metallurgical industries, chemical manufacturers, power generators, petroleum refineries, and kraft pulp and paper mills. Because of growing concern over suspended sulfates, the emissions of TVA's steam electric plants remain a major concern.



Palm-shaded beach at the southernmost point of the Florida Keys.

Solid Waste

At the end of Fiscal Year 1975, 75 percent of the population in Region IV was being served by approved solid waste disposal facilities. All States have regulatory authority for solid waste management and are at various stages of implementation. Seven of the eight States are developing general solid waste management, hazardous waste management and resource recovery strategies. The State of Florida, under an EPA grant, is commencing a market survey for recyclable materials. Because of problems with land disposal and heavy coastline development, a study is being made in Gulf Coast counties of Mississippi for resource recovery potential. In the Region, solid waste disposal problems range from those caused by the high groundwater table in Florida and coastal areas of the Atlantic and Gulf of Mexico States to those of fractured limestone formations in Kentucky and Tennessee.



The real estate and population boom in Florida has helped lead to such developments as the construction of artificial building lots at Marco Island, Fla.

Enforcement

More than 8,300 National Pollutant Discharge Elimination System permits have been issued in the Region and another 3,300 are pending. Some 6,300 of these went to industrial dischargers and another 2,000 to municipal treatment facilities. Four States have received authority to issue NPDES permits: Georgia, Mississippi, North Carolina and South Carolina.

The Region is richly endowed with coastal wetlands, and Region IV has been a leader in efforts to protect them. EPA attorneys took the lead in the winning of a landmark case involving one controversy about wetlands. This occurred in April, 1975, when a Federal judge in Washington, D.C., ruled that Sections 301 and 404 of the Federal Water Pollution Control Act did apply to wetland areas above the mean high tide. Thus, the discharge of dredge or fill materials in these areas is subject to the permit requirements of the Corps of Engineers and other regulatory actions by EPA. But in another dispute with a Federal agency, controversy continues. EPA and the Tennessee Valley Authority have long disagreed as to whether TVA is bound to comply with State emissions-limiting regulations approved by EPA as part of the State

implementations plans. TVA, whose plants account for 15 percent of the nation's sulfur dioxide emissions and 58 percent of these emissions in Region IV, has instituted intermittent controls for meeting ambient sulfur dioxide standards in the vicinity of its coal-burning plants, but insists it is not obliged to meet the States' emission limits.

In the big money item, construction grants, there have been problems here, as elsewhere. Since Fiscal Year 1973 Region IV disbursed a total of \$1.9 billion to the States. In FY 76, 379 grants actions were processed, obligating \$162,398,849. During FY 75, Region IV led the nation in award of grants for areawide waste management planning under section 208 of the Water Pollution Control Act. Twenty-eight such awards were made, with a total obligation of more than \$25 million. During the year considerable progress also was made toward completion of the water pollution control basin plans required under section 303(e) of the Act. Plans for 71 of the 92 basins in Region IV's eight States have been drafted or completed. The overall water pollution control program will benefit greatly from these plans in drafting permits, making construction grants, and estimating construction needs. □

THE SOUTH REBELS AGAINST POLLUTION

By Charles Pou*

The South—old and new, town and country, hill and dale—is a land of great and glorious contrasts.

Take the beautiful but pushy water hyacinth.

In Florida the fast-spreading plant moves in on lakes, slow-flowing rivers and streams, takes over and smothers everything. Some conservationists and fishermen put them in the same plague category with two other exotic imports, piranha and walking catfish.

They've tried for decades to think of something that would kill water hyacinths and nothing else. In ecologically related Puerto Rico, until recent years a member of Region IV, San Juan authorities once seriously considered bringing in the hippopotami to munch 'em up.

But they decided not after pondering what could be done with hungry, leftover hippopotami.

Now, across the Gulf of Mexico to the coast of Mississippi. There in the small town of Orange Grove, preliminary experiments in a lagoon reveal the hyacinth can be a possible friend.

Wastes of about 1,500 people are run through the lagoon, where grows a mat of water hyacinths. Out of the lagoon, they say, flows water so pure it exceeds State health standards.

So what was considered a foe in Florida has been turned into a friend.

An admittedly exaggerated example, this contrast of one man's adversary and another person's friend illustrates something else often observed in the region: The knack of making something bad into something good. Where hard times much of the last 100 years or so had been a condition of life, the trick was a necessity.

In Mississippi, for instance, citizens and visitors were riding gravel roads until well nigh World War II. But when the State finally got concrete and asphalt toppings, with by-then advanced design and building skills, no roads were finer.

That was sort of what happened also in the great quest for new industry after World War II, a quest which had the Region battling other Regions, States bidding against States, commu-

nities sending missionaries up North to entice and seduce with promises of plentiful land and labor.

The land. Amazing hunks of it present the same vista as when early settlers took up arms with their Yankee brothers against the tyranny of the British.

While some of the land, over-farmed for generations, was fit only to keep hell from showing through, as a regional saying goes, the earth has a way of healing itself. Tall scraggly pines grew up into fine big trees where the old cotton field terraces once followed the curve of the hill-sides. And, resting while tenants pursued Germans and shipyard jobs, it once more became some of the prettiest land on earth. Clean clear-flowing rivers flowed beside it and often the quiet was broken only by a birdsong and the occasional flicker of a squirrel hunting pinecones.

This land stretched seductively State after State, and where the lure wasn't woodland and clear, cool water, it was sun-spanked seawater and soft white



Spanish moss hangs from cypress trees in Florida's Everglades National Park.

beach. Almost one-third of the country's tidal coastline is along the Atlantic shorelines of North Carolina, Georgia and the great peninsula of Florida and on around to the coast of Alabama and Mississippi.

From the blue-grass of Kentucky to the Florida Keys lies a variety of landscapes—Appalachian, the Great Smokies and the Blue Ridge Mountains, the Piedmont plateau, and the coastal plains and marshes.

Industry came. And kept on coming. So did people.

Tourism, the people industry, took up in Florida where it left off before the Big Boom crash of the 'twenties.

But after a while it got so some of the wealthier Florida communities, like Boca Raton, were saying to people, "Halt! We don't want you. We've decided we want to get things back like they were, or no worse than they were."

In the less affluent inland and coastal cities and towns, where new industry and people brought badly needed dollars, the smoke and smells and bustle were better abided. But gradually in them too came realization of need for some sort of restraint and temperance.

This new understanding came poignantly when oil and gook bubbled up at the old fishing hole. Some of the coastal bays, rimmed with chemical plants and refineries, began to cloud. First, they became no longer fit for swimming, and then they even got too filthy for the crabs and fish.

What to do? The clash of new money and desire for some of the old way of life has caused conflicts. And the recession has reminded people how hard it is to enjoy clear, cool water unless there's something for it to wash down.

So what appears to be emerging is a new twist on the slogan of one of the

rural state governors of the late 'thirties. He got elected on a promise to "Balance Agriculture with Industry"—to let 'em stay down on the farm but come into town daytimes for a job at the factory.

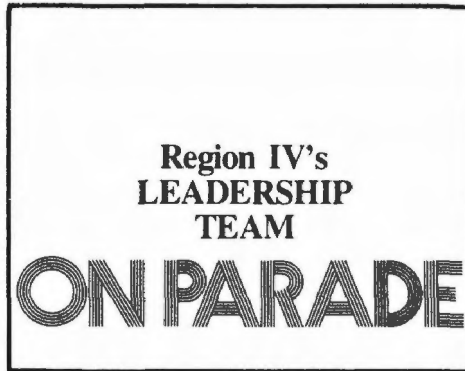
Now there is a quiet but potent undertow of sentiment for balancing the new payrolls with breathable air and fishable waters. The Region is still after new industry. But citizens are more and more insistent that the plants come equipped with pollution governors.

The South wants to rise again, and then be able to take long, deep breaths and really enjoy it. □

** Charles Pou is Public Affairs Director, Region IV.*



Joseph R. Franzmathes
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Jack E. Ravan,
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Douglas W. Shape
Director
Management Division



James H. Finger
Director,
Surveillance and
Analysis Division



Asa B. Foster, Jr.
Director,
Air and Hazardous
Materials Division

PEOPLE PEOPLE PEOPLE



Alvin L. Alm



Francis T. Mayo



Patricia Sanderson Port



Mary Leyland

Alvin L. Alm, Assistant Administrator for Planning and Management, has been selected for an Arthur S. Flemming Award as one of the 10 outstanding young persons in the Federal service for 1975. The award recognizes achievement by those persons between the age of 18 and 40 employed by the Federal Government. The awards are named for the former Secretary of Health, Education and Welfare. Dr. Flemming is now chairman of the U.S. Commission on Civil Rights and also is the U.S. Commissioner on Aging. This awards program is sponsored by the Downtown Jaycees of Washington, D.C. The program was started 28 years ago.

Michael K. Glenn, Special Assistant to the Administrator, is leaving EPA on April 9 to become an associate with the law firm of Dunnington, Bartholow, and Miller in New York City.

Mr. Glenn joined the Agency when it was formed in December 1970 as Special Assistant to John R. Quarles, then Assistant Administrator for Enforcement and General Counsel. He later served as Acting Deputy Assistant Administrator for Water Enforcement and, for the last two and a half years, as Special Assistant to Mr. Train. He was a staff member of the President's Advisory Council on Executive Reorganization—the "Ash Council"—which recommended the creation of EPA.

Dr. William J. Lacy, Senior Engineering Advisor, Office of Research and Development, has been named a Diplomate in the American Academy of Environmental Engineers. The

academy is composed of engineers certified as Diplomates by the Environmental Engineering Intersociety Board. A Diplomate is a registered professional engineer who has demonstrated, by examination before a specially qualified group of his peers, that he possesses both the knowledge and judgment to participate in solving challenging environmental engineering problems.

Francis T. Mayo, former Region V Administrator, Chicago, has been named Director of the Municipal Environmental Research Laboratory in Cincinnati, Ohio, succeeding Dr. Andrew W. Breidenbach, now Assistant Administrator for Water and Hazardous Materials.

Announcing the appointment, Administrator Russell E. Train said, "Francis Mayo's new job in Cincinnati allows us to apply his outstanding experience in regional management to the objectives of our research program." He cited Mr. Mayo's "distinguished record as the Administrator of one of our most active and difficult regions."

Mr. Mayo, 50, held a number of senior positions in an EPA predecessor agency, the Federal Water Quality Administration, starting in 1966, and was named Regional Director in 1970. He had previously worked in the Utah State Engineer's Office for 14 years, including eight years as Chief of the Water Research Division. He was graduated from the University of Utah with a B.S. degree with honors in civil engineering and is a registered professional Engineer. He is married to the former Margaret Betts. They are the parents of six children.

Patricia Sanderson Port has been named Environmental Impact Statement Review Coordinator, Region IX.

Ms. Port administers and coordinates the review and comment procedures on all Environmental Impact Statements in the Region.

Born in Fort Lauderdale, Florida, she is a graduate of New College, Sarasota, Florida, with an MA in Public Administration from George Washington University.

Mary Leyland, Chief of the Grants Administration Branch, Region II, New York, has been appointed Executive Officer in the Administrator's Office.

She succeeds Jack D. Tarran, who is now Director, Facilities and Support Services Division, Office of Administration.

Mrs. Leyland, who has been with EPA since January, 1972, served for a year in Region I and has been in Region II for about three years. Before her service with EPA, Mrs. Leyland was a consultant for the Commonwealth of Massachusetts on information systems. Previously she had served as an information systems consultant for IBM. Mrs. Leyland had earlier served as technical supervisor of data reduction for Harvard College and the Smithsonian Astrophysical Observatories.

A graduate of Newton College of the Sacred Heart, Newton, Mass., Mrs. Leyland also has a master's of education degree from Boston State College.

PEOPLE PEOPLE PEOPLE



George R. Alexander Jr.



Ms. Nellie M. Durant



Evan D. Dildine



Robert Knox

George R. Alexander Jr. has been appointed Regional Administrator of Region V, succeeding Francis T. Mayo.

Mr. Alexander, 44, had been Deputy Director, Office of Regional and Intergovernmental Relations, in Washington, since 1974 in a post which was the first mobility assignment under the Agency's new executive development program.

Administrator Russell E. Train said: "I expect that his new assignment in Chicago will provide our Regional operations with fresh and aggressive leadership."

From 1972 to 1974 Mr. Alexander was Deputy Regional Administrator in Region VI, Dallas. He received the EPA Bronze Medal for exceptional service in 1974.

Before joining EPA, Mr. Alexander was Executive Vice President of the Continental Insurance Co., Vice President and General Counsel of the Rio Grande National Life Insurance Co., and conducted a private law practice in Dallas. He earned a bachelor's degree in business administration and a doctorate in law from Southern Methodist University, and is a member of the Texas and Kentucky Bar Associations. He is married to the former Barbara Nan Dick.

Ms. Nellie M. Durant was the first EPA employee to receive a Special Fifth Anniversary Certificate of Appreciation from Administrator Russell E. Train at a recent ceremony at Headquarters recognizing the charter members of EPA.

Approximately 3,500 of the Agency's nearly 10,000 employees will be receiving the certificates, signed by both

Mr. Train and William D. Ruckelshaus, EPA's first Administrator.

The certificates recognize that the recipient is "one of the stalwarts who helped launch EPA and has taken part in the monumental task of shaping the new agency toward its mission of protecting our Nation's environmental quality."

Allen Cywin has been appointed Senior Science Advisor to Dr. Andrew W. Breidenbach, Assistant Administrator for Water and Hazardous Materials. In his new post Mr. Cywin will represent Dr. Breidenbach in dealing with EPA research projects in water and hazardous materials, with the exception of health and ecological research.

Mr. Cywin had been Director, Effluent Guidelines Division, Office of Water Planning and Standards, and before that Acting Chief of Water Quality Research in EPA. He has held management positions in the Federal Water Quality Administration and the Office of Saline Water, Department of the Interior; the Navy facilities Engineering Command; and the Agency for International Development.

A graduate of Rensselaer Polytechnic Institute, Troy, N.Y., and a registered Professional Engineer, Mr. Cywin received the first annual award given by the American Society of Mechanical Engineers for achievement in water quality control. He also won the Department of the Interior Award for Outstanding Service and the EPA Medal for Superior Service. He is listed in the Engineers' Joint Council publication, "Engineers of Distinction." He holds four patents and is

the author of many technical articles on water treatment engineering.

EPA and the Colorado State Department of Health may become more closely associated since Evan D. Dildine, permits administration and compliance branch chief in the Enforcement Division, retired from EPA Region VIII recently to accept a position as technical secretary for the Colorado Water Quality Commission in Denver.

Dildine is a civil engineering graduate of Kansas State University at Manhattan and a registered professional engineer in Kansas and Colorado. Dildine started work at the Commission January 5. He had been with EPA's Denver office nearly four years, moving from Kansas City's EPA office.

Robert Knox, Chief of Manpower Development and Training for Region II, New York City, has taken a year's leave to study environmental engineering at the New Jersey Institute of Technology, Newark, N.J., under an EPA training grant.

Mr. Knox, a graduate of Temple University in Philadelphia, worked in that city's Water Department for 15 years and was director and lead instructor in the first Federally-sponsored education program for water pollution control plant operators. Before coming to Region II he was Regional Manpower Development Officer in EPA's Region IV, Atlanta. He lives in Matawan, N.J.



high school parley

Student leaders and newspaper editors from 18 high schools in the Greater Boston area took part in a recent conference on environmental issues sponsored by the Region I Public Affairs Office.

The students quizzed EPA officials on pollution problems and discussed what young people can do to improve the environment in their communities. Regional Administrator John A.S. McGlennon spoke on career opportunities in environmental conservation and protection. The conference was the first in a series designed to enhance communication between EPA and the Region's youth.



training mechanics

Training auto mechanics to tune emission control systems as well as engines is the object of three new programs in New York State, sponsored by EPA and the U.S. Office of Education. Grants were awarded to the Bronx Community College, \$20,000; the Nassau County Board of Cooperative Education Services, \$8,000; and the State Department of Environmental Conservation, \$7,000, to develop teaching materials and train mechanics. Funds for the programs were made available by the Office of Education.

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master's degrees

EPA fellowships will permit 35 air pollution control technicians in New York City to enroll at Cooper Union for environmental studies that can win them master of engineering degrees in three years. The fellowships pay for instruction, books, and an annual stipend. Regional Administrator Gerald M. Hansler said the training would help local and State environmental agencies develop the expertise needed to make New York City a more healthful place.

pesticide penalties

Nearly \$13,000 in civil penalties for pesticide violations were assessed recently against three companies: Bixon Chemical Co., Corona, N.Y., \$3,350 for its Pine disinfectant and \$4,045 for its K Germ Disinfectant and Pyrenon-Diazinon residual insecticide; Utility Chemical Co., Paterson, N.J., \$4,800 for Germicide; and Richard E. Rover Co., Belleville, N.J., \$750 for a dog shampoo. The products were misbranded or adulterated or both.



oil spill fines

Civil penalties totaling \$16,950 have been levied on 35 different companies in Region III for failing to prepare or implement plans to prevent and contain oil spills, Regional Administrator Daniel J. Snyder III announced. The largest fines collected were \$2,250 from the Budd Company, Philadelphia, and \$2,000 from the Lee Hy Paving Corp., Richmond, Va. All are now in compliance with the law.

Mr. Snyder has cited another 40 firms for spill plan violations, and these companies are working with the Regional Office to correct them. Suburban Village Inc., Whitpain Township, Pa., has paid a criminal fine of \$100 for failure to notify EPA of an oil spill. The maximum penalty is \$10,000, and Regional officials had requested a \$2,500 fine. The incident occurred Dec. 8, 1974, when approximately 4,000 gallons of fuel oil was spilled into a creek from a construction site. EPA first learned of

the spill 12 days later through a citizen complaint.



grants set record

Region IV awarded \$164.5 million in sewage construction grants in the last quarter of 1975, Regional Administrator Jack E. Ravan announced. The record amount included \$127 million during December, which he said was more than one-fourth of grant funds obligated nationally that month by EPA.

"We are expediting the flow of funds to cities because we see a double benefit: cleaner water and the creation of new jobs in the construction industry," Mr. Ravan said. Funds obligated to the States were as follows: Alabama \$9.4 million, Florida \$52.7 million, Georgia \$11.2 million, Kentucky \$24.2 million, Mississippi \$4.4 million, North Carolina \$32.6 million, South Carolina \$25.1 million, and Tennessee \$4.9 million.



photos on tour

An exhibit of DOCUMERICA photos titled "Inner-City Connections" will be shown this spring in major cities of Region V. Arranged by the Public Affairs Office, the tour will include Detroit, Mich.; Gary, Ind.; Milwaukee, Wisc.; Cleveland, Ohio; and Minneapolis, Minn. The exhibit has already been shown in Chicago.

ready for cruise

Region V's "Navy" will be cruising the Great Lakes again this summer. The Roger R. Simons, a former Coast Guard buoy tender, will analyze Lake Michigan's water quality to check up on cleanup efforts in the Great Lakes. The ship is named after an employee of the Federal Water Quality Administration, an EPA predecessor agency, who was accidentally drowned in 1970 while taking samples from the Mississippi River.

lake superior conference

EPA officials took part in an international conference on the environmental, economic, and transportation aspects of Lake Superior March 9-11 in Duluth, Minn. The conference was sponsored by the Minnesota Pollution Control Agency.



town meetings

Town meetings to encourage citizen participation in environmental matters were scheduled in New Orleans, La., March 24 and Albuquerque, N.M., March 25. Deputy Administrator John R. Quarles Jr. and Regional Administrator John C. White were slated to be the hosts.

The New Orleans meeting was to be televised by WYES-TV to permit telephoned questions and comments from citizens throughout the viewing area.

Mr. White said the town meetings have been gratifying and beneficial in arousing citizen concern and informing the public on EPA programs.



pesticide workshop

A regional workshop on training in the safe and effective use of pesticides will be held for vocational agriculture teachers and officials in Kansas City April 12-13.

State and district vocational agriculture supervisors and other representatives from States in Regions VI and VII are expected to attend. The workshop is one of a number of such meetings sponsored by EPA.



radiation survey

Radiation from waste piles at uranium

milling sites may threaten public health if the piles of sand-like wastes are not managed in an environmentally sound manner. Region VIII Administrator John A. Green said recently.

The wastes contain radium that has a radioactive half-life of more than 1,000 years, Mr. Green said, commenting on a newly published survey of 20 inactive uranium mill sites in the West. Thirteen of the sites are in Region VIII.

The study "clearly indicates that radioactive material has already migrated from the original piles and spread over hundreds of acres of land," he said, and the risk at each site will have to be determined individually.

colorado salinity

The Denver Research Institute of the University of Denver has been awarded a one-year, \$88,000 contract by EPA to help reduce the salinity of the Colorado River.

The Institute will analyze and evaluate the maze of present regulations and practices in the seven Colorado Basin States to seek improvements that can be made with the least difficulty and cost.

Dr. J. Gordon Milliken, project director, believes that changes in policies and regulations within existing States, commissions, and local water districts can produce more effective control of salinity. The saltiness of the Colorado reduces crop yields, fouls drinking water, corrodes piping, and increases treatment costs.



three-way cooperation

Three Federal agencies in Region IX are cooperating in their work on energy and environmental activities and in telling the public about them. The agencies are EPA, the Energy Research and Development Administration, and the Federal Energy Administration. Regional Administrators of the three agencies agreed last fall to work together and keep each other fully informed on research and demonstrations in the conversion of solar and geothermal energy. A joint work plan was agreed to and quarterly reports will be issued. Additional fields of joint work are

expected to include the use of solid wastes as fuel and regulation of storage facilities for Alaskan and offshore oil. An Energy Information Center is planned in the EPA regional library, to be staffed in part by FEA and ERDA employees and containing all technical documents of the three agencies. Briefings and information material will be supplied to the San Francisco Federal Information Center.



water condemned

Buses, ships, and interstate aircraft were recently barred from using drinking water from Port Angeles, Wash., because the city water failed to meet Public Health Service standards. Regional Administrator Clifford V. Smith Jr. said that the ban was necessary because for two of the previous 12 months, the city's water contained too many bacteria, and for five of those months the city failed to submit the required number of bacteriological samples. State inspectors checked the water and recommended corrective actions, Mr. Smith said. The city must meet PHS standards for at least three consecutive months before the ban will be lifted.

green monster

A 35-ton mobile water decontamination plant dubbed the "green monster" returned to Seattle last month to help the Army Corps of Engineers clean up the Duwamish River.

The Corps is dredging an estimated 30,000 to 40,000 cubic yards of sludge from the waterway. The sludge contains polychlorinated biphenyls, toxic chemicals spilled 18 months ago. The "monster" treats the water that is drained from the sludge, a final precaution that EPA is requiring. Drained water from the sludge contains some solids and PCB's, said Regional Administrator Clifford V. Smith Jr. "EPA wants to be absolutely certain the water is treated before it is pumped back into the Duwamish." □

ARE YOU PLANNING A SPRING GARDEN?

Gladys Harris, National Program Coordinator, Education and Manpower Planning, Headquarters:

"I certainly am. Five years without a garden was just more than I could stand. So I'll be back in horse and mountain country in Clarke County, Va., on spring weekends to the farm garden staked out and plowed last fall. Naturally on a Virginia farm, the first rows will be flowers—zinnias, marigolds, backed up with gladiola and a mixture of cutting flowers.

"In April the onions, radishes, lettuce and peas will already be through the ground. The potatoes were planted on St. Patrick's Day and as soon as the oak leaves show green, everything else will go in the garden. The tomatoes must be beefsteak and corn the white shoe peg variety, planted at least four rows deep for pollination. I was glad when they developed stringless bunch beans as they thrive beautifully in this area.

"After the mounds planted with four or five cucumber seeds and the rows of corn, yellow squash and limas we'll tuck in a few bell peppers. The last row will be planted with sunflower seed, just for the cardinals—Virginia's and our favorite bird. I may even try some pumpkins and cantaloupes by the creek this year.

"It's a real feeling of accomplishment and rejuvenation to straighten up an aching back and survey rows of manicured soil protecting and nurturing those pretty green plants. One can picture jars and cartons of garden produce on the shelves and in the deep freeze. Somehow, food never tastes better than when you help Nature grow it."

Albert Soper, Physical Sciences Technician, Environmental Research

Laboratory, Narragansett, R.I.

"My garden plans for this year are to fill my 30-foot-square plot with a little bit of a lot of things. They will include tomatoes, onions, carrots, beets, lettuce, swiss chard, radishes and beans. The yield will provide my family and some friends with fresh vegetables from late spring until early fall. When I have a surplus I take them to the Laboratory and put them out near the coffee pot for whoever wants them. Some of the vegetables like tomatoes and beets will be canned for the winter.

"Growing your own vegetables does save some on food bills, but for the most part I do it because I enjoy the fresh produce and I like to watch things germinate and grow. I've had a garden here in North Kingston, (about ten miles north of Narragansett) since 1962. Gardening is a carry-over from my boyhood in Canada, where we always had a garden. I use no pesticides and have no significant pest problems. I plant enough for the insects and rabbits to have their fair share."

Gloria Griffith, Administrative Technician, Environmental Research Laboratory, Athens, Ga.

"Yes, but we grow mostly weeds. We'll probably plant butter beans, string beans, okra, cucumbers, onions, potatoes, crowder peas, and tomatoes in our small backyard garden. If we need corn we get it from my father.

"Fresh vegetables taste so much better than the ones you can buy in a can or frozen. There's nothing like going into your own backyard and picking a nice, fresh, ripe tomato right off of the vine and eating it. We eat garden-grown vegetables in the winter,

too, so we save money.

"My two kids, ages 5 and 6, help my husband and me. We always get more out of it than we put in it."

Ida Lawson, Secretary and Staff Assistant to the Regional Administrator, Region IX, San Francisco, Calif.:

"Garden? The only garden I have time for is the plant in my office, because that's where I seem to spend most of my time. Actually, I'd like to see the whole world become a garden which is not too practical a thought—but we're trying."

Peter Dunsavage, Aquatic Biologist, Enforcement Division, Region VI, Dallas, Texas:

"I'll do my initial planting in mid-March, when the last freeze in this part of Texas is over. We can have radishes on the table three weeks later, and good, general production by June.

"I plant tomatoes, peppers, squash, onions, radishes and cucumbers in my small downtown Dallas garden. Since I never use pesticides, I don't plant cabbage, broccoli, and other leaf-vegetables because their survival depends upon the constant application of pesticides. My wife plants marigolds all around the vegetable garden to ward off insects, and she has garlic in her rose garden for the same reason. I have found that 5-10-5 fertilizer, which is a mixture of nitrogen, phosphorus and potassium, is great for my kind of garden, because it provides for well-balanced plant and fruit production.

"In addition to the \$50-100 a year savings on our grocery bill, we have garden-fresh vegetables with every meal. Also there is the rewarding enjoyment of watching the garden grow. It's a great hobby."



Gladys Harris

Albert Soper

Gloria Griffith

Ida Lawson

Peter Dunsavage



news briefs

MANUAL PUBLISHED ON CROPLAND WATER POLLUTION CONTROL

EPA and the Department of Agriculture have jointly published a book, "Control of Water Pollution from Cropland," outlining ways to prevent common farming pollutants from reaching the Nation's waterways. These pollutants include sediment, nitrogen and phosphorus compounds, and pesticides. A limited number of copies are available at EPA from the Agriculture and Nonpoint Source Management Division, RD-682, EPA, Washington, D.C. 20460.

MOST COMPANIES COMPLYING WITH UNLEADED GAS RULES

Random checks at some 19,000 gas stations last year show that unleaded fuel is generally available, as EPA rules require, Norman D. Shutler, Director of Mobile Source Enforcement, has reported. Major violations were found at only between one and two percent of the stations visited, Dr. Shutler said, and fines totaling \$23,675 were levied against eight refiners and 45 distributors and retailers.

DEALERS FINED FOR TAMPERING WITH AUTO EMISSION CONTROLS

Three automobile dealers recently paid court-ordered fines amounting to \$2,450 for removing or tampering with emission control devices in violation of the Clean Air Act. The firms and their fines were: Scuncio Chevrolet, Greenville, R.I., \$1,200; European Motors, Olympia, Wash., \$750; and Motion Performance Products, Inc., Baldwin, N.Y., \$500. In each case, the dealer was also ordered to commit no further violations.

COMMON SOLUTIONS SEEN FOR ENERGY, ECONOMY, ENVIRONMENT

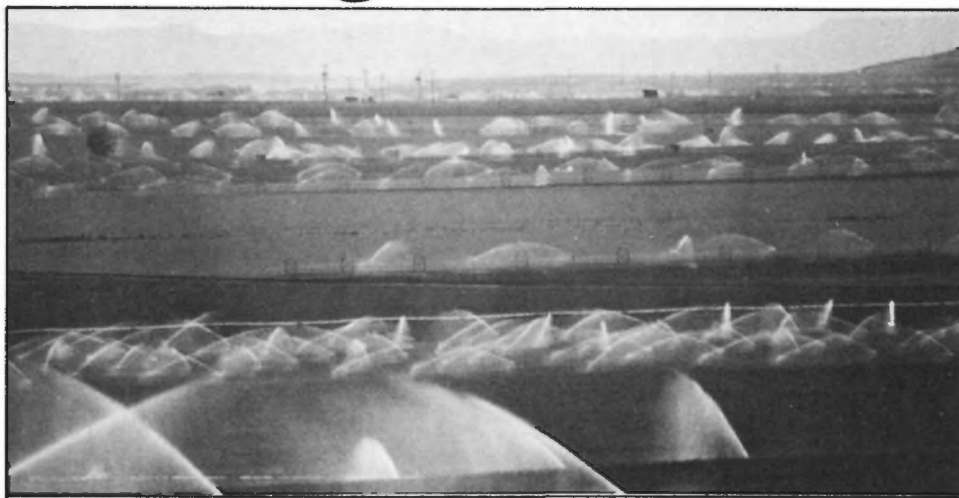
"In the long run there is no inherent conflict between our energy, economic, and environmental needs," said Administrator Russell E. Train in a recent commencement address at Michigan State University in East Lansing. "They all require that we make the most of our basic natural capital. In the short run, each must serve in some respect as a constraint upon the others."



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Watching the Salt

By Eddie Lee*



Sprinkler irrigation system giving lifesaving water to summer crops in western Idaho.

Nine king-sized earth cores are being used to find better ways to manage and reduce the heavy salt content of irrigation wastewater in a research project at the Robert S. Kerr Environmental Research Laboratory in Ada, Oklahoma.

The cores are contained in fiberglass columns which look like outside hot water heaters. The columns are eight feet deep, 30 inches in diameter and filled with undisturbed soil.

They were obtained from the Perkins Agronomy Farm operated by Oklahoma State University at Perkins, Oklahoma, by carefully excavating around the circumference so that a steel cutting rim could lead a fiberglass container around the earth to the desired depth. Small samples were taken around each column at six-inch intervals on the way down to establish the physical and chemical characteristics of the soil.

The nine columns, believed to be the largest containing undisturbed earth in existence at this time, are being used to develop management systems

which will minimize the salt content in water after it is used for irrigation.

There are about 44 million acres of cropland irrigated in the United States, about 90 percent of them in 17 Western States. This represents only about 10 percent of the Nation's cropland but the irrigated land generates about 25 percent of the total crop value of the Nation.

For centuries, irrigated agriculture has been practiced in arid and semi-arid areas of the world. Today, supplemental irrigation is becoming increasingly commonplace in even humid regions during the growing season. In Florida, for example, there are 2.4 million irrigated acres.

After use for irrigation, the water returns to streams or seeps through the soil into the groundwater. In addition to salt, it carries with it sediment, pesticides and fertilizers, and organic debris—all damaging to water quality.

Dr. James P. Law, chief of the Irrigated Agriculture Research Section at Ada, says the earth-filled columns will be used first for salinity control.

Alfalfa will be the columns, wh environmental cl and quality of w and intensity of crop can be cont

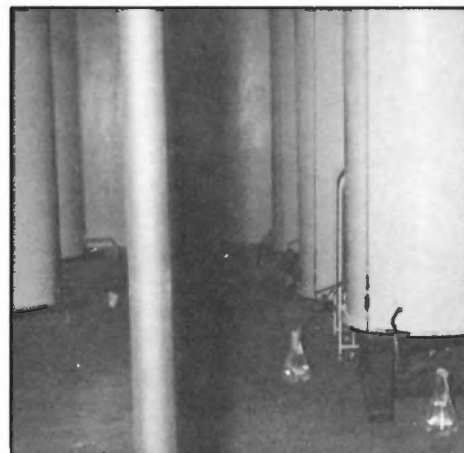
Dr. Arthur Hager, says that environment, gro ated so that thre be raised.

"We can com three to five tir months we can of data compar ements in the field,

he says. The lower portions of the columns are in an instrumentation chamber where sensors are being installed every six inches of depth of the columns. The sensors will be connected to a computer for 24 hour-per-day monitoring.

The sensors will measure the amount of water moving through the soil in relation to the amount applied and the amount and location of the salt, Dr. Hornsby says.

"Our objective is to determine the optimum amounts of water under various quality conditions to achieve maximum crop production and minimum environmental damage."



The columns contain earth cores. The flasks on floor sample water which has trickled through the earth.

* Eddie Lee is a public information officer at the Kerr Laboratory.