



AGRICULTURE AND THE ENVIRONMENT

Ecology is now a central theme of the American people, and concern over and the solution of pollution problems are vital for the long-term quality of life. Agriculture, along with several other industries, has been singled out as a major source of environmental pollution. Although agriculture was one of the last industries to be popularly targeted as a major source of pollution, agriculture, like most other targeted industries, reacted with indignant denial. There is some basis for agriculture's denial, moreover, since the topic of environmental pollution has been subjected to some elements of exaggeration and overreaction.

Farmers were among the first to recognize the symbiotic relationship between man and his environment. Their everyday contact with and dependence on the environment forced farmers to become conservationists. As a result, farmers adopted crop rotation, contour farming, and other techniques that helped maintain the natural environment. Since all changes are stimulated by the awareness of a particular need, the problems that stimulated farmers to adopt most of their early conservation efforts were identified only within the farming sector. Being often unaware of new techniques adopted, society neither condemned nor applauded these efforts. However, recent problems have also been identified by nonfarmers, a fact which has caused a greater polarization between producers and consumers and may limit the flexibility of solutions to these problems.

Factors affecting the present situation

The major cause of agricultural pollution has been the lack of knowledge by either farmers or society as a whole as to the effects of various technologies on the environment. DDT was known to be beneficial in the control of insects, fertilizers con-

tributed to better yields, and large feedlots produced meat more efficiently. No one knew the long-term effects of DDT, fertilizer leaching into streams, or the high concentrations of livestock wastes.

The competitive market and consumers have both contributed to the situation since only the most efficient producers could compete and only high quality products would be accepted. Because of market demands any farmer who failed to use the latest technologies lost either his profitability, his market, or, in fact, both.

The resulting dilemma is an agricultural production structure that is the creation of a competitive market, tuned to consumer demands, and based on technologies that have recently been denounced as detrimental to the total environment. What can be done to resolve the problem?

Possible solutions

One suggestion is the immediate cessation of all agricultural technologies that cause pollution. At first glance, such a solution seems desirable. But what would be the effects? Texas A&M University has estimated that the withdrawal of all agricultural chemicals alone would result in a 36 to 47 percent decline in yields per acre of major crops. With such supply changes, current price elasticity models are not reliable. But estimates indicate a possible three-fold increase in food prices along with general food shortages and lower qualities if agricultural chemicals were withdrawn from use.

While ecology is an important goal, there are short-run as well as long-run necessities and priorities to consider. Ample supplies of food of both high quality and at low cost must be maintained. Any cut in supply, with a resultant price increase, would have regressive and immediate impact on all consumers. Therefore, an alternative solution is necessary.

**EFFECT OF WITHDRAWAL OF NITROGEN FERTILIZER,
HERBICIDES, AND INSECTICIDES ON OUTPUT OF
SELECTED AGRICULTURAL COMMODITIES¹**
(Percent)

Commodity	Per-acre yield reduction resulting from withdrawal		
	Nitrogen fertilizer and herbicide	Insecticide	All chemicals ²
Grain sorghum	35%	18%	46.7%
Cotton	30	12	38.4
Rice	35	4	37.6
Wheat	30	9	36.3
Fresh vegetables	28	20	42.0
Oranges	10	40	46.0
Grapefruit	10%	30%	37.0%

¹ The expected percentage reduction in per-acre yields resulting from withdrawal of nitrogen fertilizer, herbicides, and insecticides was estimated by Texas A&M University staff from available data of the Texas Agricultural Experiment Station.

² Assuming no chemicals are utilized, the percentage loss attributable to elimination of insecticides is applicable to only that production possible with no nitrogen fertilizer or herbicides.

SOURCE: Texas A&M University

While lack of awareness of actions detrimental to the environment was a major contributor to the current ecological crisis, awareness of the problem is the first step toward a solution to the problem. Given this awareness, the agricultural sector can proceed toward a solution. A total assessment of the situation must be made. Where possible, immediate elimination of harmful procedures or chemicals should be achieved, with acceptable substitutes being initiated. Where acceptable alternatives are not available, more judicious use of harmful chemicals, for instance, can minimize the damaging effects until new alternatives are developed. However, any of these steps have the inherent potential of increased production costs. These are costs that society has not recognized before because the environment was not considered in the past. Now that environmental quality is included in the consideration of production costs, consumers will necessarily have to bear this cost.

Current efforts

Research on the use of chemicals, especially pesticides and herbicides, indicates less extensive use more carefully applied in timing and location can achieve equal results. Similar results are being found with fertilizers, and it has been noted that nitrogen, under normal conditions and use rates, is not subject to extensive leaching. Numerous biological controls of insects are being advanced. These biological controls are usually natural enemies of the destructive insects or reproduction controls. Efforts to totally eradicate insect pests, such as the boll weevil, are also under way and would eliminate the need for pesticides. Better designed feedlots are assisting in livestock waste problems, and use of these wastes for crop production is being advanced. Silt control is being advanced, and extensive research for improved, less persistent chemicals is under way.

The impact

The first reaction by farmers was that any changes would be impossible or prohibitive in cost, but some of the steps already taken indicate this is not always the case; i.e., better chemical application saves farmers money. Other changes, such as livestock waste control with lagoons with graded or paved pens, have had indirect benefits of improved weight gains and less cattle stress due to mud and water. Several feedlots are using pen runoff to bring previously unproductive land into production.

These are benefits and improvements that the mere recognition of the problem has achieved. However, the total solution of agricultural pollution is possible only through concerted and united efforts of all people concerned.

RICE PRICES HOLD UP

Despite reduced demand, the high quality of the 1970 crop and higher support rates than in other recent years have kept rice prices high in the 1970-71 season. Although domestic use has remained about even with last year's level, exports are below the record levels of recent years.

The carry-over this summer is expected to be about 16.4 million hundredweight, approximately the same as last year's. This amount would be substantially above carry-overs in the years prior to 1970.

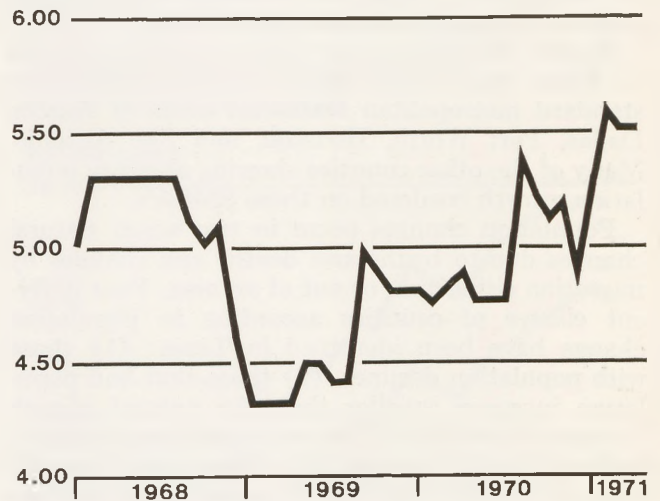
The slowdown in exports and the large domestic carry-over is due to a record world rice crop last year and expectations of a 2-percent increase this year. Not only have import demands of many rice-deficit nations been reduced but areas such as South America, Japan, and the Philippines have entered the export market. The USDA expects 1971 prices in Southeast Asia, the major export market, to be below last year's relatively low level.

The minimum support price for 1971-crop rice will be \$4.93 per hundredweight. However, the

actual support rate, to be based on the August 1 parity price, will probably be higher. This should provide relief to rice farmers until either domestic or export markets pick up.

AVERAGE RICE PRICES RECEIVED BY TEXAS FARMERS HIGHER IN 1971

DOLLARS PER HUNDREDWEIGHT



SOURCE: U.S. Department of Agriculture

RURAL-TO-URBAN MIGRATION CONTINUES IN TEXAS

During the past ten years, the population of Texas increased from 9,579,677 to 11,196,730, a 16.9-percent increase. Texas grew substantially faster than the nation as a whole and became the fourth most populous state in the nation. However, this growth was not evenly distributed within the

state. In fact, 146 Texas counties had population declines, while another 51 had net out-migration between 1960 and 1970.

The rural-to-urban migration phenomenon continued to be a very important fact in Texas as only a few rural counties in the Panhandle and along the Rio Grande showed absolute growth. In several of the areas, the high growth rate is due to the extremely small population base in 1960; for example, Brewster County grew from 6,434 to 7,780. However, several major urban counties and cities, such as McLennan County and Waco, had population declines during the decade of the sixties.

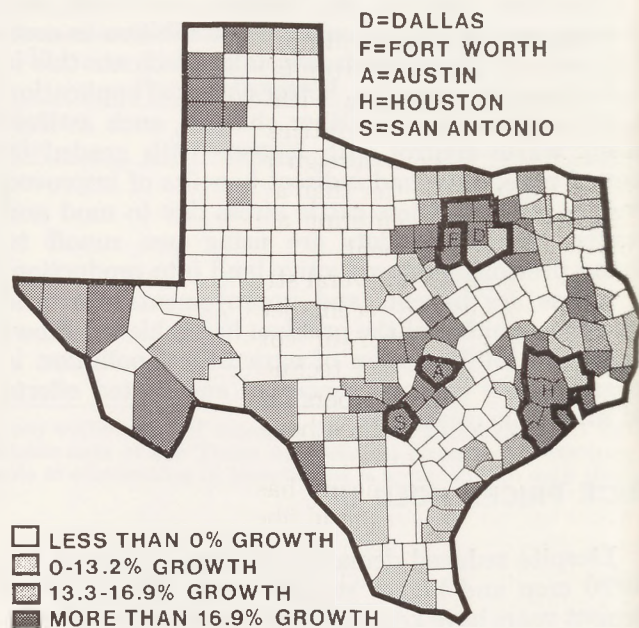
In fact, over 85 percent of the population growth in Texas during the 1960's occurred in the five standard metropolitan statistical areas of Austin, Dallas, Fort Worth, Houston, and San Antonio. Many of the other counties showing absolute population growth bordered on these SMSA's.

Population changes occur in two ways: natural changes due to births and deaths and changes by migration either into or out of an area. Four different classes of counties according to population change have been identified in Texas: (1) those with population declines, (2) those that had population increases smaller than the natural growth rate established by subtracting deaths from births—or from 0 to 13.2 percent, (3) those showing growth rates greater than the natural growth rates but less than the state average, or between 13.3 and 16.8 percent growth, and (4) those having growth rates greater than the state average or more than 16.9 percent growth during the 1960's.

The first two groups of counties experienced out-migration while the second two groups experienced in-migration. The question that must be answered is why there is such a difference among the counties.

A recent study by the Federal Reserve Bank of Dallas established that the major determination of migration was job opportunities and wage differentials. Between 1958 and 1968 the average rural county had a net decline of 8 percent in the total

POPULATION GROWTH CENTERED AROUND FIVE SMSA'S



SOURCE: U.S. Bureau of the Census

number of jobs available. This decline was primarily due to a decline of some 150,000 agricultural jobs. At the same time, urban incomes were averaging more than 40 percent more than rural incomes in general and 60 percent more than agricultural workers.

Any change in these migration patterns depends on the growth of employment in the counties suffering from job scarcity, especially the rural counties. The wage differentials can be expected to provide incentives to new plants to locate in the rural areas. However, until more job opportunities are available to rural residents and the wage differentials narrow, rural-to-urban migration will continue.

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