PAUL MAYFIELD, Hercules Powder Co.,
President, National Agricultural Chemicals Association

A Sound Future for . . .

AGRICULTURAL CHEMICALS

The agricultural chemicals industry has changed greatly and grown rapidly during the past decade. Assessment of its position and a look to the needs of the future are offered by the president of the industry's association

IT IS NO SECRET that the past year has presented difficulties for the agricultural chemicals industry. But there are many reasons why the future can and should be sound and bright. It is the future that is to be considered. The past is a subject for contemplation rather than crying.

The use of chemicals against agricultural pests is by no means a new practice. It goes back to ancient history. But the discovery of the insecticidal powers of DDT changed the picture to such an extent that since that time we have had what might properly be called a new era in agricultural chemicals. DDT was so effective and its discovery stimulated so much advance in the organic chemical attack against pests, that growth of the industry has been tremendous since World War II. In fact it is quite a different industry from that which existed previously. A. W. Mohr in his presidential address before the National Agricultural Chemicals Association, September 1953, estimated that 80 to 90% of the industry's 1953 business was built around new chemicals, not a pound of which was available in 1945. The great promise of new openings presented by this change produced a growth and development so rapid that some of it has been random and haphazard. There has been some rather blind approach to the development of this industry. We can now look back and see the results of enthusiasm which led to excessive production before the market could be assessed or developed.

It is well known that there have been a number of legal and regulations problems. There have been some court decisions which not only have harmed the companies involved, but have set back the progress of the entire industry. The NAC Association has received reports on claims against the industry totalling more than $7 million in the past few years and those reports admittedly are incomplete. To quote Mr. Mohr: "The ratio of liability to profits, compared to the chemical industry, is out of all proportion."

Public relations problems have caused considerable difficulty and concern. Those problems cannot be entirely separated from liability suits. Accurate, sound public information on the true nature, use, and dangers of agricultural chemicals is far behind what it should be. But pesticides have had a great deal of public attention. Because pesticides are widely discussed there is much misinformation, downright exaggeration, and pseudo-scientific double talk that is giving the pesticides an undeserved "black eye." Scientific developments are easily the target along with the businessmen whenever the public is stirred up by false propaganda against something new that represents the achievement of science translated by industry into a product for use.

It is generally considered that our economy will be tightening in the coming year so that business will not be quite so easy as it has been in the past. How then can soundness of the future progress of the agricultural chemicals industry be assured?

The Industry's Place

What is the place of the industry? We know that there is a great deal of waste involved in agricultural production today. Much of this waste can be attributed to insects, weeds, and other pests. Accurate assessment of the amount of that waste is very difficult. Guesses within the past year have ranged from $12 to $17 billion. While we can't say just what it is, we can say with certainty that the order of magnitude is high.

On the other hand, we are overbur-

dened with food surpluses. Increase of production is not the desirable goal for every commodity at present, but rather more efficient production of sufficient quantities of top quality. Certainly agricultural chemicals can be an important tool in achieving such a goal.

In any area of production today, either agricultural or otherwise, technological change is a very important influence. Production techniques and the patterns of use are changing with increasing rapidity. Agriculture is an industry and a competitive one. Futhermore it is becoming more competitive with other industries. We may illustrate this by considering that outstanding problem—butter. Does anyone think that butter will return to its dominant position? It is doubtful. It is reasonable to think that other agricultural products are in danger of losing their positions to new products developed by research. Those new products will not necessarily be grown on the farm. That threat must be faced and met by the farmer. The best technique of combat is lower costs through increased efficiency. Certainly the Government is making an effort to aid the farm situation, but the real answer lies in the cooperative efforts of the farmer, industry, and government.

At the present time less than 15% of the crop land receives the protection of chemicals during the growing season. In comparison at least 25% of the land receives applications of fertilizers each year. Probably not more than 10% of the farmers on the average are using agricultural chemicals to advantage in this country. We have the research and the technology worked out and it remains only to disseminate this information properly to bring to the attention of the farmers the economic advantages to be had from their use.

In cotton, defoliation by agricultural chemicals, properly timed, facilitates harvesting and improves the profits. This has been so successful that in 1952, 3 million acres of cotton were so treated and it is estimated that will increase by 500,000 acres this year. The facilitation of harvest of legume seeds, through chemical treatment, has increased yields as much as 50%. Estimates of the saving in 1950 by chemical treatment of 600,000 acres of wheat against the greenbug was 2.5 million bushels. In one year of use of chemicals against the velvetbean caterpillar, Georgia and Alabama growers of peanuts and soybeans were saved an estimated $15 million.

Another example of a method available through chemical means to improve production on acres in use is the adaptation of certain crops to areas in the United States where they could not be produced previously. For many years some fresh vegetables could not be produced commercially in the southern part of our country where the season is long and conducive to the best growth. The climatic situation in those areas was so favorable for the increase of insects and diseases that 75 to 80% of many fresh fruits and vegetables were rendered unfit for consumption. As soon as suitable chemicals were developed which would handle these pest problems, production of vegetables in the southern part of the United States increased to tremendous proportions. It had been the practice to move one type of crop to a new section of the country when the pests built up to the extent that commercial production became impossible. In some cases this new area was less suited to the production of these crops than the old area but the transfer was necessary. With the new organic chemicals it is now possible to raise crops in any section of the United States where the climatic conditions are best suited to plant growth.

Yet we estimate that less than 15% of the crop land is protected by chemical treatment during the growing season.

It has been estimated that reduction by one third of the agricultural losses attributable to pests would make available the equivalent of nearly 100 million additional acres. If we could effect that reduction of waste by one third, we could reduce the amount of land in use for agricultural food production by a little less than 100 million acres and still produce as much as we are getting at present. Since the cost of production is related to the number of acres farmed, we could be producing the same amount of food at a considerably lower cost and with much less work. By pursuing that whole process a little further, we might even reduce our surpluses while maintaining farm income at least at the present level. Futhermore, we would have available reserve capacity for use as our population grows or to meet a national emergency.

The world situation is quite another matter. Throughout the world there is a shortage of food. We have been warned that the accumulation of surpluses in the United States, while hunger exists throughout other parts of the world, is a growing cause of ill feeling toward this country. Certainly there is a great need for improved farming methods and reduction of waste in other parts of the world. Fulfilling those needs is no simple problem. But it is a challenge to be met if we are sincere in our talk of a better world. World communications have made economic, social, and political developments in any part of the globe almost immediately influential on all of us. No one who looks to the future can ignore it.

We have considered only food production, but another area in which pesticides have played and continue to play a very important part is that of public health, not only in the United States, but throughout the world.

There is an important place for the use of agricultural chemicals which is by no means fully developed.

Developing the Position

The next question is what should be the approach to improving our development of this important position.

Intelligent original planning by each individual company with clean, aggressive competition within an industry framework of cooperation among the members of that industry can pave the road to sound growth.

The agricultural chemicals industry has a trade association through which these objectives of cooperation can be approached—I shall even say achieved. The National Agricultural Chemicals Association is an active nonprofit organization of businessmen with a common interest in furthering more and better control of pests. It was founded in order to promote such a broad program aggressively without individual prejudice or selfish interest and without lessening the healthy competition among its members. It has as its objectives the stimulation and sponsoring of laboratory and field research in chemicals and equipment and the safer use of products. It encourages education and acts as a screening and coordinating center from which the industry, agriculture, and the public are informed of pertinent activities. Recognition is given to legisla-

On The Cover

Mayfield . . .

A Decisive Year Ahead

THE AGRICULTURAL CHEMICALS INDUSTRY is now in the process of girding for battle against this year's invasion of insects. The discussion of that industry and its future is written by Paul Mayfield, president of the National Agricultural Chemicals Association, which will meet in Houston, March 24 to 26.

Mr. Mayfield has been associated with Hercules Powder Co. since his graduation from the University of Indiana in 1925. He joined the company as a chemist at that time and shortly thereafter transferred to the sales department. In 1936, he became assistant director of sales of the naval stores department. Since 1950 he has been general manager of that department of Hercules. He is a director of the company.

The cover background, courtesy of USDA.

tion designed to control the sale, distribution, and use of agricultural chemicals for the protection of both reliable firms and the public welfare.

Efforts of the NAC Association are directed toward keeping members advised of the existence and changes in the many laws and regulations with which they must comply. It is continually interested in working with state and federal legislative bodies in drafting laws that are practical and realistic. It has consistently promoted close relations with the U. S. Department of Agriculture, Land-Grant Colleges, and the U. S. Department of Health, Education and Welfare. It seeks to cooperate with independent laboratories, scientific groups, and individuals, as well as associated industries, to promote safer and better controls of pests. The NAC Association recognizes the value of the good will of the public and strives to promote favorable public reaction by stimulating high standards of quality in products and the proper and safe use of those materials.

Avenues of Approach

What then, are some of the avenues of approach within that framework of cooperation which may aid every member of the industry and help to build on a sound, businesslike operating basis?

Although the United States Department of Agriculture collects a certain amount of data on pesticides, the agricultural chemicals industry does not have adequate, up-to-date statistics. No one in an industry which encompasses as many producers as does the agricultural chemicals industry can expect to plan and operate intelligently if he does not have a reasonably sound basis for knowing where that industry has been and what it has done.

Total secrecy in an industry may have been fashionable 50 years ago, but it is not a practical thing today. Other industries, related and unrelated to ours, have available to themselves and to the public, sound estimates of each year's production, of sales, and often a certain amount of data on the uses to which their products have been put. Consider the fertilizer industry, probably our closest relative, which has available to it much detailed data of the kind mentioned. The success and prosperity of that industry and the companies in it argues against harm coming from the availability of such data.

It is possible through proper organization and planning to gather these data in an ethical manner such that the business secrets of a company will not be given out and no holes will be opened thereby in competitive armor. But on the positive side, sound knowledge of an industry's operation offers the basis for the guidance of development with an eye to healthy competition, rather than movement by hunch or by blind rushing.

Even though we now have adequate manufacturing facilities, the basic chemicals, and a reasonable quantity of stocks of pesticides on hand, it does not necessarily mean that the farmer will be able to control completely his agricultural pests at the time he desires. We must still have an efficient distribution of these products which requires the cooperation of the dealer selling them and of the grower who uses them. Due to the very seasonal nature and the unpredictable size of infestations our industry has found it necessary to maintain unusually heavy stocks of farm chemicals when

compared to other phases of the chemical industry. During the war years and immediately following, the industry, agricultural leaders, farmers, and dealers all worked together to have an available stock of crop protectants on hand in advance of the season to handle at least part of the requirements which could be anticipated. During 1953, this early purchase program completely broke down and several serious incidents occurred in which heavy outbreaks of pests in some areas of the United States rapidly depleted dealers' stocks and serious crop damage was imminent. The industry took extraordinary means to replace those stocks on very short notice and managed to prevent severe losses to crops in those areas. Bear in mind that we were able to do this because we entered the 1953 season with one of the largest inventories in the history of our industry. Such is not the case in 1954.

The oversupply of chemicals which built up during 1952 and 1953 has caused manufacturers to take a thorough look at the situation in this phase of the chemical industry. Industrialists are approaching the 1954 season with a great deal more caution than was displayed in the past two years of our experience. Reinstatment of the "buy early" program can be of real help to the farmer and to the industry.

Assessment of Possibilities

A great deal has been said about the losses from the ravages of pests in agriculture, but how much do we really know about the situation? While there may be some figures developed on the basis of knowledge or study, many are chosen on the basis of one man's opinion. Such data are picked up, quoted as fact in speeches or publication, and through repetition and modification they become what amounts virtually to gossip. Some of this gossip may not exaggerate but it does allow a misconception of the practical aspects of the total picture. Even where data are available, it may not be qualified or classified in such a way that its immediate and future significance or its practical and theoretical importance can be separated. The industry cannot do cooperative market research for the entire field, but the way ahead can be easier with development of a little sounder idea of the total picture and better perspective on the situation.

Research Is Expensive

The cost of research and development is high and is growing. It costs several thousand dollars, at a minimum, to bring a new agricultural chemical to the stage of commercial production. Beyond that are very expensive toxicity and field tests and market research and development. Recently, *Fortune* published an analysis which set the figure at $1,446,000. Other figures up to $2 million have been reported as the costs of bringing out products now on the market.

At such costs we cannot proceed without some reason to believe that there is a market which will pay those bills.

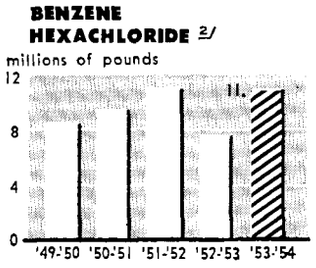
Some very attractive possibilities for new products are demanding attention. Plant diseases remain a research challenge yet unsolved. According to the 1953 *Yearbook of Agriculture*, they cost the American farmer $3 billion a year. Antibiotics already are moving into this field, but there is not sufficient reason to believe that possibilities stop there. The yearbook reports also that diseases destroy 20 to 40% of the sweet potato crop. Leaf spot fungus destroys annually about 20% of the Costa Rican coffee crop and may reach up to 75%—a sensitive subject today. Cotton root rot, a fungus disease, attacks more than 2000 different species of wild and cultivated plants. The only known practical control of that disease, which reduces cotton yields 5–10% in some areas. is crop rotation.

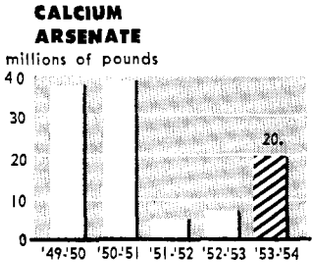
These are only a few examples of future possibilities crying for attention. The research needed to produce a successful control agent is costly. Financial backing for such research will be difficult to find if effective products now being developed fail financially because they are pushed out into a market which is overestimated in an industry operating in the dark. Our future lies in research and must be protected by sound, successful current operation.

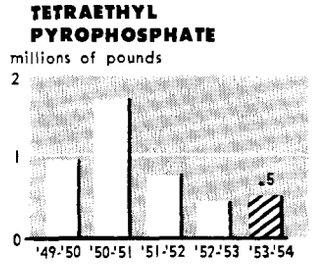
MAJOR PESTICIDES – DISAPPEARANCE AND REQUIREMENTS [3]

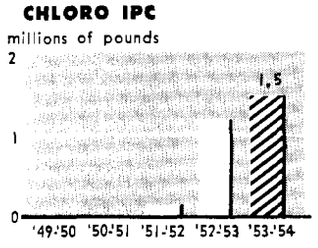
DOMESTIC DISAPPEARANCE AT PRODUCER'S LEVEL

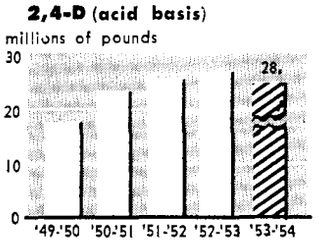
MAXIMUM REQUIREMENTS FOR CONSUMPTION 1953-54

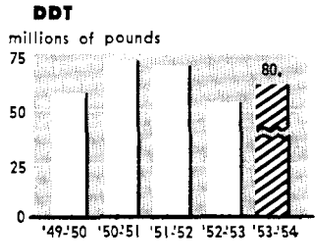


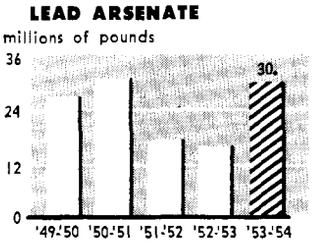


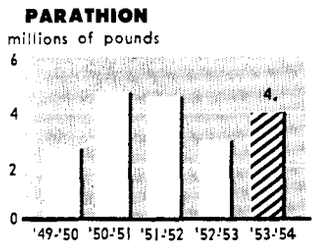


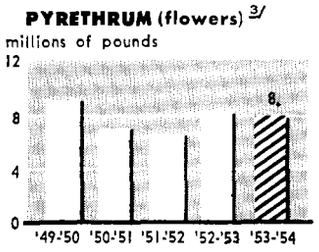


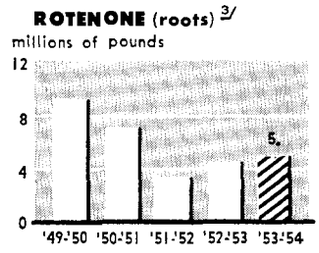


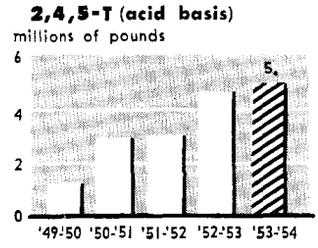












[1]/All figures are millions of pounds; some are based on incomplete information; crop year is from October to September 30 of the following year.

[2]/Gamma isomer basis; includes lindane.

[3]/Imports

Foreign Relations and Trade

Within the past year the NAC Association has set up a foreign trade committee. This committee will give attention to foreign conditions and markets. As indicated earlier, the basic need throughout the world for agricultural improvement points up important possibilities for development of these world markets. Through proper industry support of cooperative efforts on this score, we should be able to make a worthy contribution as well as improve our position.

Liability Problems

The number of ways in which pesticides can be misused is great despite efforts at careful labeling and instructions for use. It is logical, of course, to expect some problems in the introduction of a new toxic agent, and the agricultural chemicals industry is no exception. Study of the history of specific liability cases is one of the best methods of preparing to avoid future difficulties. This doesn't mean merely study of legal histories, but careful study of a frank, complete report of the details of the incident.

The agricultural chemicals industry has an association with a staff and committees organized for the purpose of studying laws and regulations and the liability problems which arise, in order to give industry the benefit of what is learned by experience.

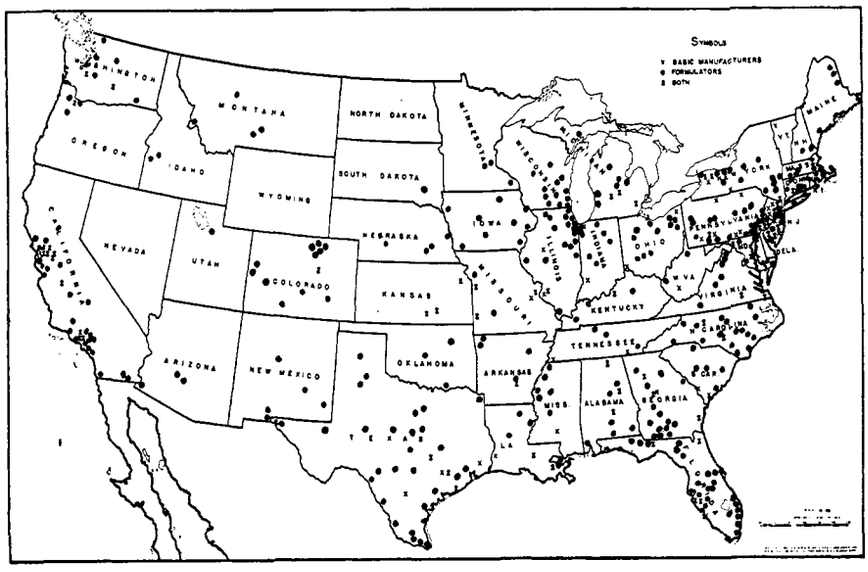
Legislation which is before Congress at the present time will correct some of the costly and cumbersome procedures which have previously been necessary to obtain pesticidal residue tolerances under the Food, Drug and Cosmetic Act of 1938. The bill will also, if it is adopted, treat pesticides separately from other chemicals used in the processing and preserving of foods. However, sufficient information must be made available to the Food and Drug Administration to establish that a farm chemical can be used in such a manner that either no pesticidal residues will result or that the residues which do result will occur on foods or food products in amounts which are not detrimental to the public health. To meet these requirements of the Food, Drug and Cosmetic Act will require continued extensive studies as to toxicity prior to the marketing of chemicals in interstate commerce.

The development of the Miller Bill, in which the NAC Association was called upon for suggestions and advice, illustrates the constructive assistance which can be rendered by an industry association.

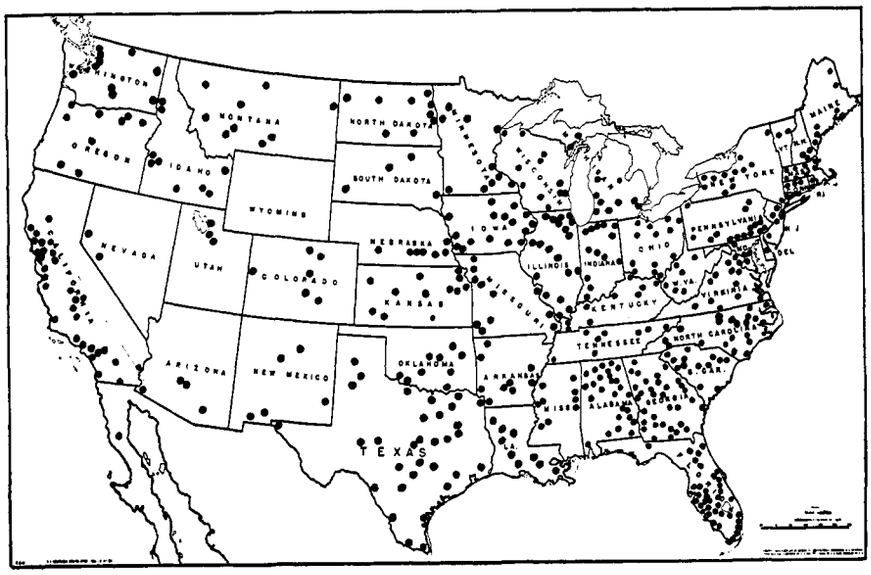
State regulations are extremely important in the agricultural chemicals business. In 1946 the problem came up for discussion in the Council of State Governments. The result was a model state insecticide, fungicide, and rodenticide act. The NAC Association participated in the framing of this act by advising the committee on the industry's position. The association is continuing its efforts in aiding and encouraging the adopting of state acts conforming to the model. We must not only comply with the federal insecticide law, but also with the laws of the individual states. The association has made much progress in getting the adoption of a uniform state insecticide law in many states.

Public Relations

Liability and regulations matters are not unrelated to public relations. Public pressure can bring about passage of un-



BASIC MANUFACTURERS AND FORMULATORS AS REPORTED BY NAC



WAREHOUSES AND DISTRIBUTION POINTS AS REPORTED BY NAC

These maps, developed as the result of a poll of NAC members, show the agricultural chemicals industry's nationwide distribution

reasonable legislation. Or it can give support to a suit which is stimulated by opportunism. The industry's sound program of public relations will contribute not only to the future of agricultural chemicals but also to public welfare.

Only 10 years ago DDT was being hailed as a wonder chemical to rank with the drugs which are eliminating such diseases as malaria and typhus. The aerosol bomb was a symbol of the American Army to many of the people of North Africa and Italy. From time to time grasshopper and locust plagues are prevented from bringing catastrophe only through the use of agricultural chemicals. But today we find the other side of public opinion being aroused while the favorable aspects are neglected. The Sunday supplements are being loaded with allegations that DDT and other "poisonous chemicals" cause all manner of human ills. The agricultural chemicals industry is pushed to a defensive stand. A positive approach is needed. There is far more written on the positive side of the ledger. It should be brought out of the dark and placed before the public. Fair, honest public education is all that is needed. But a vigorous effort will be necessary to make progress in that respect.

The extension of public educational efforts at the local level should aid greatly.

When we speak of the public being misled by scare stories about chemicals on foods, we mustn't forget that the majority of our farmers are apparently not yet convinced that pesticides are a good investment. Less than 15% of the nation's cropland is protected by pesticides, although this is the finest and least expensive insurance the farmer can buy. Even in the cotton-growing areas, where the tonnage of insecticides is high, it would be rare to find a section where all the growers regularly use pesticides. This almost seems incredible, in the face of the abundant evidence that there are now many dusts and sprays that give safe, economical protection against cotton insects and pay for their cost in the higher yield per acre. Yet the fact remains that the whole pesticide industry is selling much less than its potential in the one area of the United States that is most alert and educated on the value of insect control.

Not only are there too few farmers using these materials, but many that do use them are not using them in sufficient quantity or in the most effective manner to derive the maximum amount of return from their investment in farm chemicals. For example, the average yield per acre of cotton in certain areas of South Carolina was 400 pounds of lint. In these same areas, under experimental conditions, the proper use of pesticides and fertilizers gave over 1600 pounds. With correct management and reasonable pest control, it is possible and economically feasible to increase the yield by at least one third in this and other cotton-growing areas.

A laudable example of cooperative effort is seen in the recently developed nationwide program of the Interassociation Council of Pesticide and Applicator Manufacturers. This program is designed to acquaint the public with the advantages of using the right pesticide with the right applicator at the right time. The program will urge dealers to work closely with county agents, vocational agriculture teachers, experiment stations, and other agencies.

In summary it can be said that the modern agricultural chemicals industry is a child of technical progress. We see not only in our own industry, but in others as well, that where there is rapid growth based on technical progress, the success of the industry as a whole can be directly related to the amount of support given by individual members to broad industry programs. A trade association is a logical center for the development of such programs. But the effects must be more than internal. Public acceptance of new things does not come automatically. The answer to the agricultural chemicals industry's problems, despite weather and national economic variations, can be found through the industry's own efforts.