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THE FERTILIZER INDUSTRY OF THE SEVENTIES

By: Ben D. McCollum, Vice President Simplot Fertilizer Co.

The old cliché that an expert is one who is more than 100 miles from home qualifies my being here. Another definition that has been given is an "ex" is a has been and a "spert" is a little drip under pressure - maybe this also qualifies me. Past performance of the fertilizer industry would not indicate it to be very reliable as a forecaster of the future. Its logic has been something like the following -- A dumb girl is a dope - a dope is a drug - Doctors order drugs to relieve pain. Therefore a dumb girl is just what the doctor ordered.

Attempting to choose my subject matter for this talk was as frustrating as the rural lady who woke up one morning to find an elephant in her garden. Not having seen an elephant before she ran to the phone and called the Sheriff and said "there is a large monster in my garden and it is pulling up my cabbage with its tail." The Sheriff asked, "what is it doing with them?" and she responded, "Sheriff, you would never believe it if I told you."

In order to talk about the fertilizer industry in the seventies, I think one must review what happened in the sixties. A revolution occurred in all phases of the industry. World famine was the talk of the decade and starvation would be common by 1980.

Studies indicated that it took from the time of Christ until 1830 for the world to arrive at a population of 1 billion people. It only took 100 years to add another billion, 30 years for another billion, and by the year 2000, 40 years later, we will add 3 billion more.

Fertilizer was the one item that could forestall this disaster. The common question wasn't how much fertilizer would be needed, but instead, could it be supplied in time. Little thought was given to logistics and the capability of people in developing countries to obtain and pay for these products.

Industry growth rates were high. New technology for production had been developed where economies of scale could be employed in new large plants. Significant changes have occurred in manufacturing, especially in nitrogen. Between 1960 and 1970 there was a tremendous increase in construction of anhydrous ammonia plants.

The number of plants nearly doubled and the average plant size more than doubled. Many reciprocal type plants that produced 100 to 350 tons/day were replaced by large centrifugal plants which produced 600 to 1500 tons/day.

Larger plants have continually increased their share of the total production capacity. In 1960 production was primarily associated with the Chemical Industry; today, it is associated with the Petroleum and Natural Gas Industry. Many of the new production facilities were moved away from the major marketing areas, to locations near large sources of raw materials. This, in turn, caused changes in the economics of distribution to various fertilizer use areas.

Similar expansion in phosphate production also took place at this time. Development of potash production in Canada on a scale never before thought possible was initiated.

As the economies of bulk handling and distribution were recognized, an increase of more than fivefold, from 3 million tons of fertilizer materials distributed in 1960 to almost 16 million tons in 1970, took place. The increase in the number of bulk blend plants in the U.S. clearly illustrates the shift to bulk handling systems. The number of bulk blend plants in the U.S. in 1970 estimated to exceed 5,100, compared with only 400 in 1960. A similar increase also occurred for liquid materials while the total tons of bagged fertilizers declined to about half of its 1960 level.

The close of the sixties found the industry in critical condition. It was plagued with over production capacity. Production innovations had largely outstripped the consumption capabilities. In the U.S. in 1970 Nitrogen consumption was approximately 7.5 million tons, but approximately 10.5 million tons of Ammonia were produced, and there was enough plant production capability to produce nearly 14 million tons.

The Phosphate Industry had similar conditions to the Nitrogen Industry. During 1965 through 1970 P_2O_5 production capacity went from 4.9 million tons to 7.2 million tons. With the addition of these new plants, however, about 1 million tons of existing capacity had closed down. 1970 consumption was only 5.1 million tons, or there existed an excessive production capability of 2.1 million tons.

For analysis of the potash situation the U.S. and Canada have been considered as one unit. In 1970 the total supply capacity was approximately 10.5 million tons and only 5.7 million tons were exported or consumed locally. Obviously, there is no prospect of balancing supply and demand within the next 5 years.

Along with the over production of fertilizer was an accompanying excessive building of retail outlets to market the production. Prices were at levels below those of 1950 -- loss operations were the rule. Anhydrous Ammonia prices have dropped from \$175/ton in 1953 to \$79/ton in 1971.

Studies covering the entire Fertilizer Industry show that pre-tax margins and return on equity are well below the break-even point.

The aftermath of such conditions was expected. Reductions of unnecessary expenditures were the call of the day. The sale of and/or closure of uneconomic facilities -- both production and marketing -- were some of the early moves.

Next came the elimination of people not directly involved in production and marketing. The groups most adversely affected were process development and agronomic personnel. With this background it is needless to say that wild optimism does not yet abound. I think it is safe to make some conclusions and forecast of a few things that can be expected in the seventies.

In the face of reduced budgets, major technical breakthroughs are not expected and if such does occur, their exploitation is unlikely with present over-production capacity and the poor economic performance of the industry. It would appear that production techniques of basic products will change little during the early part of this decade. Industry's investment capital will be directed toward pollution control.

We will continue to use Nitrogen products with high plant food content which will reduce shipping and handling costs.

Wet process Phosphoric Acid will continue to be the phosphorus source of the 70's.

More liquid phosphate fertilizers will be applied in an attempt to reduce handling costs.

In the future more attention will be given to Sulfur deficiencies in plants. The cheaper Sulfur prices will lead to more emphasis on the use of Sulfur for field application.

Due to the over-expanded production capability of potash, the Canadian Government has imposed quotas on production and established a floor price. Since Canada now accounts for 55% of North American production, it appears that a regulated supply is a definite situation for many years.

New PK products of extremely high analysis are in advanced stages of research and will probably appear on the market in the 70's. There may be some shifting in world markets as new competition develops in other countries.

More and more micronutrient deficiencies are appearing and they will soon be a common part of the farmers fertility program.

It would seem to me that Industry will be looking to land grant colleges and experiment stations for basic research as in the past. If I read the signs of the times right, that research will be strongly influenced by the environmentalist and conservation groups. Large farmers will be turning to private consultants for services previously provided by Industry.

Some of the likely questions they will be concerned with are the rates of application in relation to possible run-off of excessive fertilizer use. The different sources of N-P-K in regard to their solubility will be investigated further.

The efficiency of N-P-K carriers in regard to their ultimate use will likely get attention.

Methods of application will be adjusted to cause maximum efficiency in the uptake by the plant.

Consideration will be given to the proper balance of nutrients at the right time in the plant's growth cycle to produce the desired quantity factor for food processing.

Dealers will be required to evaluate the fertility level of the soil, determine which elements are short and provide a fertility program that will fit the desired yield and quality of a specific crop.

Industry will concentrate on a refinement of products. The adaptation of products for specific use will be given more attention, such as specialty starter fertilizers that reduce stand loss due to fertilizer burn of the seedling.

Another example - urea coated with sulfur. This not only provides sulfur but slows the release of nitrogen. This product should find good acceptance under certain climatic conditions. Another example is Golden Triple that we produce and which was specifically designed for the coastal range areas of western Oregon and northern California. In this case the product is a homogeneous mixture of Triple Superphosphate and elemental sulfur. Coating made the phosphate too insoluble.

Customer use and material handling considerations will be given major attention in product innovation. Labor costs have skyrocketed and in many areas is not available. The logistics of moving product with the least amount of labor will be in demand in many areas. Labor problems will be magnified again by the demands of the farmer customer. The farm trend will continue to demand custom application service by the supplier or many farmers will turn to equipment that will reduce labor by performing several cultivation practices at one time -- such as weed and feed programs.

Plant changes will be required to meet safety standards as well as changes necessary to comply with air and water pollution control laws. Some plants will be forced to close if no economic means is found to comply. Other government and state regulations will cause standards for licensing to be set on the marketing of Industry's products.

These are only a few of the problems that are likely to occur, however, we also look forward to continued growth, better products to meet customer needs, safer plants, less reaction from various pressure groups and a better appreciation of the contribution the industry is making in providing good, economic, wholesome food for the consumer.

In summary, one might expect:

1. Agronomic research to be influenced in the direction of improving the efficiency of applied fertilizers - to determine level of loss through run-off or leaching - to investigate solubility of various products and how these characteristics influence their use under given crop, soil and climatic conditions.
2. Technical development of new processes will be limited with the possible exception of potassium phosphates. Innovations & combination of present products to meet more specific needs will be a prime direction. Exploitation of present technology, particularly in liquid mixes or suspension areas will be further developed.
3. As to distribution, it will continue to be most strongly influenced by labor and freight cost. The trend to more concentrated products will continue in an attempt to offset high freight cost. Greater share of the market will be supplied with bulk and fluid products at the expense of bagged products since these tend to lend themselves to greater mechanization in handling.
4. The impact of government regulations will continue to exercise more influence over our industry. Product analysis and weight control have been with us for many years, however, new emphasis will be felt in regard to air and water pollution control equipment. Capital cost required is not likely to benefit direct plant returns and these costs will show up in increased prices.

During the past two decades the farmer has been caught up in the inflationary spiral of paying higher prices for his production inputs. That is with one exception -- fertilizer. Despite all the industries problems, fertilizer will continue to be one of the farmer's best buys in terms of increased returns.

Use will continue to increase and will be vital to economic food production in the future.