NOW you can formulate high concentrate wettable powders at low cost with MICRO-CEL

SUBSTANTIAL FORMULATION SAVINGS

Micro-Cel*, a new line of synthetic calcium silicates, has extremely high absorptive properties. It is this remarkable capacity for absorption that makes it possible to prepare wettable powders with higher concentrations of dry, viscous or liquid poisons. Micro-Cel's absorption also means that more lower cost diluents can be used. Thus high strength formulation costs are now cut to a new low.

REMAINS FREE-FLOWING—MEETS STORAGE TESTS

With Micro-Cel, these high concentrates will remain in a free-flowing state even after prolonged storage. This is particularly important in producing poisons for the export market.

In addition, suspension values after storage of 1.5 to 2.0 I.C.A. have been achieved in 75% DDT wettable powders, based on Micro-Cel. This is more than adequate for storage conditions encountered in most tropical countries.

DEVELOPED BY JOHNS-MANVILLE RESEARCH

Micro-Cel is another development of Johns-Manville Research. Combining high absorption, large surface area, small particle size and excellent dry flowability, it offers a unique combination of properties for insecticide formulation and other process needs.

Sample quantities and carload shipments are now available. Write for further data and sample formulations for poisons of interest to you. Or ask a Celite engineer to help you adapt Micro-Cel to your particular requirements and specifications.

JM PRODUCTS

*Micro-Cel® is Johns-Manville's new absorbent-grinding aid designed specifically for the insecticide formulator.

Johns-Manville

MICRO-CEL

SYNTHETIC CALCIUM SILICATES

A PRODUCT OF THE CELITE DIVISION

Johns-Manville, Box 60, New York 16, N.Y.
In Canada: Port Credit, Ontario

Please send ☐ further information: ☐ samples of Micro-Cel. I am interested in using Micro-Cel with the following poisons:

_____

☐ Please have your local representative contact me.

Name_____ Position_____

Company_____

Address_____

City_____ Zone_____ State_____

CORPORATE

profile...

Herbicides biggest factor in Dow Chemical's line of chemicals for agriculture and food

Dow marketed the first successful synthetic organic foliage insecticide in the United States—dinitro-*o*-cyclohexylphenol. "And we still make it," says Edgar C. Britton, who is in charge of the company's organic chemical research.

That was in the 1930's. Before then Dow was already making the inorganic insecticide, lead arsenate, and the fungicide, lime sulfur. Today agricultural chemicals account for a significant part of the Dow Chemical Co.'s annual sales, which totaled $470 million last year.

Insecticides still constitute part of Dow's agricultural chemicals line, but herbicides account for greater dollar volume than any other single group. Fungicides, grain and space fumigants, plant hormones, methionine, and animal disease control products also are important.

Much of the ammonia Dow produces at Pittsburg, Calif., Freeport, Tex., and Midland, Mich., is used industrially, but some is used for agriculture. Dow even makes some potassium chloride at Midland. Last year it purchased Versenes, Inc., and has continued to make chelates for agricultural and other uses.

The company sells hydrochloric acid (for gelatin), potassium hydroxide, glycerol, propylene glycol, methyl cellulose and many other chemicals to the food processing industries. Another interest in the food industry stems from its plastic materials, such as polyethylene and Styron (Dow polystyrene) for containers, and Saran Wrap, a plastic film, for food packaging.

The present Dow Chemical Co. was organized in 1897. The founder, Herbert H. Dow, had launched his first attempt at chemical manufacture —making bromine from brine—in 1889, and the present company is the successful survivor of several enterprises started by Dow between these dates. Like the others, it was based on chemicals which could be made from brine—first bromine and then chlorine. Today a large number of Dow's products are based upon these two elemental raw materials.

Brine wells in the area brought Herbert Dow to Midland, Mich. The small plant he started there has grown into a huge installation which now employs 10,500 of the company's 24,000 employees. After Midland, the two plants of the Texas division at Freeport and Velasco are the largest of the 12 manufacturing operations. Dow has several subsidiaries, and some partially owned associate companies: Dow Corning, Ethyl-Dow, and The Saran Yarns Co.

The President . . .

Leland I. Doan

Finished products for the farmer

Dow Carries Heavy Research Program

Dow's agricultural research has come a long way since Edgar Britton used to do his own field testing of new pesticides back in the 1920's. At that time he and the other organic chemists found some good materials for use against aphids and apple scab, but none cheaper than ones already on the market, so they were not exploited. Walter Dutton initiated a field research program in 1936, and in 1937 the biochemical laboratory in Midland started an insecticide research project.

Dinitro-*o*-cyclohexylphenol was first tested by J. F. Kagy while at Iowa State College. Kagy joined Dow in 1941 and is now director of Dow's Western division agricultural research laboratory. Dinitro-*o*-*sec*-butylphenol was developed later as a herbicide.

During World War II Dow entered the 2,4-D business because of its position as a supplier of the intermediates, dichlorophenol and chloroacetic acid. The company now has a continuous program in which thousands of compounds are screened for agricultural possibilities. Every compound newly synthesized in any of the company's laboratories is sent for screening to biochemical and agricultural research.

"It takes real money to get a new pesticide on the market," says Edgar Britton. It is hard to decide which compound to put through the various stages of development. A new insecticide or fungicide has to be especially good. "There are some awfully good ones on the market already." Costs of complete testing alone for commercial use for each new compound that gets extensive field evaluation may run $200,000 to $300,000. Weed killers used in connection with food crops also require expensive research and development, and even those used along railroad rights-of-way require careful evaluation. Of course, performance testing is only part of the story. Much more must be spent on research to work out economical manufacturing process and complete formulation, packaging, residue analyses, and toxicological studies.

Research and development for agricultural chemicals at Dow today is in the hands of Julius Johnson and Keith Barrons. Johnson has research and Barrons development, but the two work together so closely it is difficult to draw a clear line between their responsibilities.

The three main sites for Dow's agricultural research are: Midland, for herbicide, insecticide, space and grain fumigants, foliar fungicide, animal disease control, analytical, and formulation research; Seal Beach, Calif., for nematocide, soil fumigant, and special Western herbicides research; and the Texas division, for animal nutrition and advanced animal disease control research. Field men in research and development are located in several areas throughout the country.

"We like to make sure we go far enough with a new ag chemical in our own hands to have reasonable assurance of performance and continuing interest before we turn it over to an experiment station," Johnson points out. He and Barrons believe the place of experiment station research on agricultural chemicals is during the advanced stages of development of the new chemical tool. Screening of new chemicals should be done by the supplying companies.

"On the average, it takes five to seven years to get a new ag chemical on the market—if we get all the breaks," says Barrons.

TEPP gives you time-controlled toxicity

TEPP is a pesticide automatically "timed" for safe control.

It kills, then vanishes. Crops sprayed one day can be harvested 48 hours later with no lingering poisonous residue.

TEPP's *"time-controlled toxicity"* gives farmers a quick, sure way to check last-minute infestations that could ruin an otherwise fine crop right at harvest time.

Low in cost, TEPP swiftly controls aphids, thrips, red spider mites, leafhopper nymphs, flea beetles, cabbage caterpillars and many other pests. Fewer applications are needed and crops arrive at markets or processing plants in cleaner, better condition.

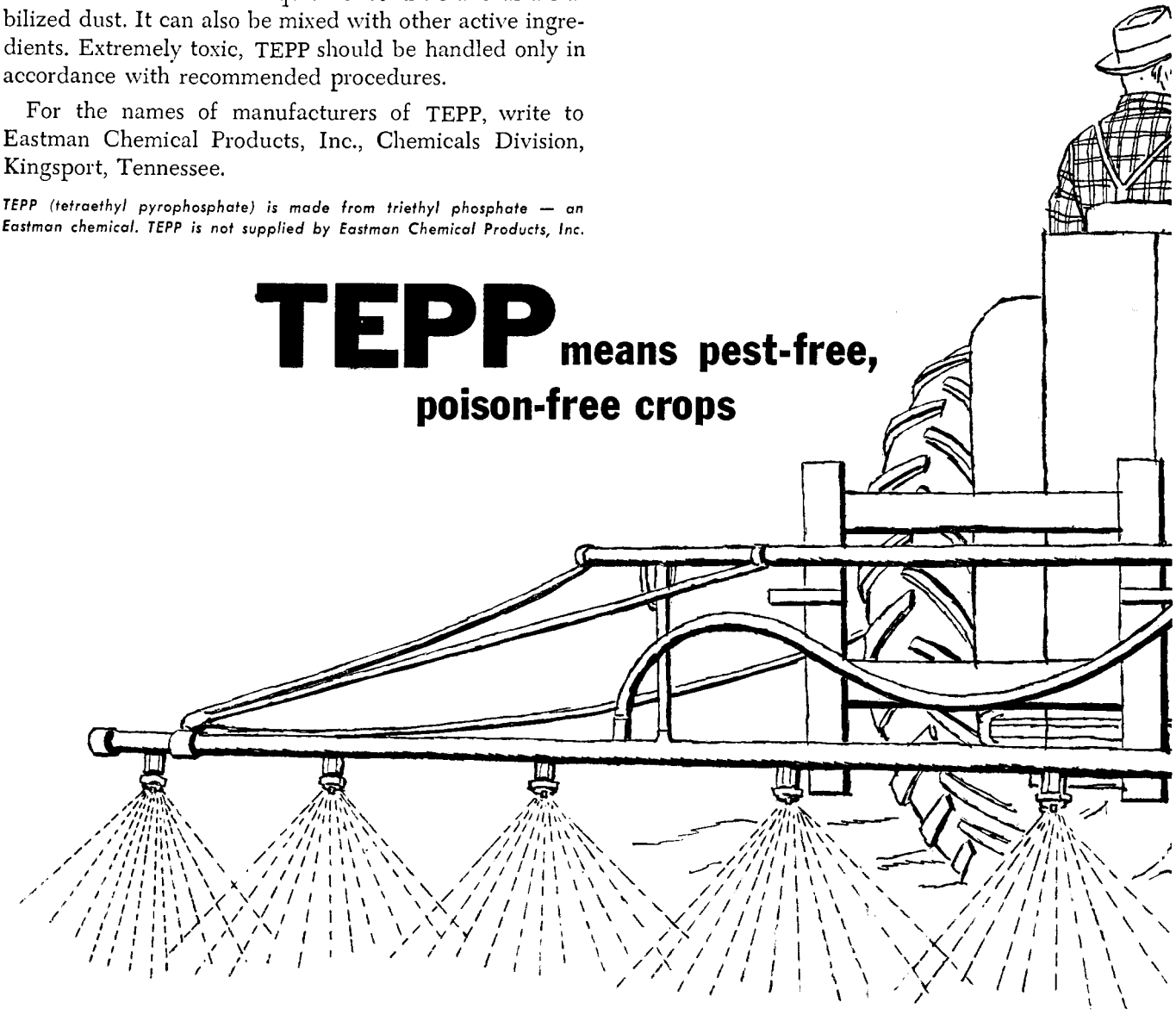
Some users are saving from ⅓ to ½ of the cost of insecticides and their applications by using TEPP exclusively.

TEPP is available as a liquid concentrate and as a stabilized dust. It can also be mixed with other active ingredients. Extremely toxic, TEPP should be handled only in accordance with recommended procedures.

For the names of manufacturers of TEPP, write to Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tennessee.

TEPP (tetraethyl pyrophosphate) is made from triethyl phosphate — an Eastman chemical. TEPP is not supplied by Eastman Chemical Products, Inc.

TEPP means pest-free, poison-free crops

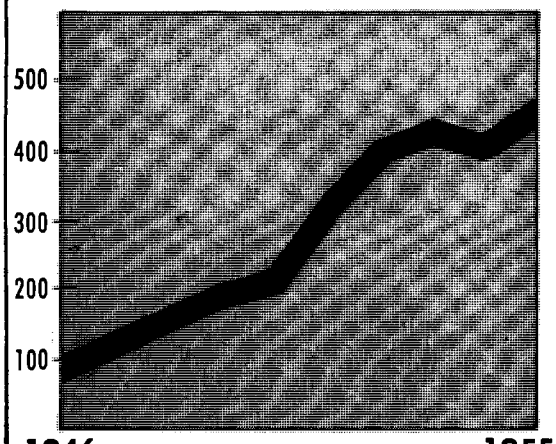


Eastman CHEMICAL PRODUCTS, INC., KINGSPORT, TENNESSEE, a subsidiary of EASTMAN KODAK COMPANY

Dow Chemical Co.

Food consumes many Dow chemicals. From insecticides, herbicides, soil fumigants, chelates, amino acid feed supplements for growing food to glycerol, methyl cellulose, propylene glycol for processing food and plastics for packaging it

Annual Sales (Millions of Dollars)



Dow also carries out a certain amount of plant nutrition research. In addition to anhydrous ammonia, the company is interested in chelates, which open another important phase of plant nutrition. Preliminary work shows that these compounds might also be of some value for metal ion regulation in animal feeds.

The amino acid methionine, made by the Western division, is used in animal feeds as well as in certain pharmaceuticals.

A change in thinking from the old "full line" approach of some years ago is in progress at Dow. "We eliminated 35 products from our line during the last six years," says William W. Allen, who is in charge of sales for agricultural chemicals. In regard to new products Dow intends to confine itself as much as possible to chemicals derived from its own basic raw materials.

One of Dow's outstanding market development triumphs is soil fumigants. Dow worked on them for 12 years, and it has only been in the last two or three seasons that they have begun to pay off. "It is hard to sell a new concept," Allen explains.

Dow has sold formulated products almost from the beginning, and now more than ever it strives to sell a finished product for the consumer. This means considerable development work on the actual product itself, but it makes for a more stable business.

Dow expects a "slight increase" in sales of ag chemicals this year, and is bullish about longer term forecasts. J. W. Britton (a brother of Edgar's), who is responsible for the over-all, management of Dow's agricultural chemical business puts it this way:

"The area of ignorance in agricultural chemicals is so much greater than the area of knowledge, that I can't be anything but optimistic. So far we have only been interested in compounds which *kill*. How about plant growth? If, instead of herbicides, we move into the broader field of plant growth regulators it is easy to see we haven't scratched the surface. Soil chemistry, too, is in for a big push."

DIRECTORY

Chemicals, Equipment, Supplies and Service to the Agricultural and Food Chemistry Fields

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