

Ag and Food Interprets . . .

- ▶ **Federal, state officials mobilize against Medfly threat**
 - ▶ **Potash industry engaged in major exploration, expansion**
 - ▶ **Extending air application difficult during low farm income period**
 - ▶ **Haul-it-yourself enables formulators to speed customer service**
 - ▶ **DDT and exports probable keys to 55's pesticide prosperity**
-

The Medfly

Federal and state officials mobilize to drive Mediterranean fruit fly from U. S. shores once again

MEDITERRANEAN FRUIT FLIES are again in the news after a 25-year absence. At the beginning of May the Florida State Plant Board quarantined infested areas; then in mid-May, USDA quarantined two southern Florida counties, Dade and Broward, to help halt the spread of this citrus threat. Regulations set up provide that all fruits, vegetables, and other potential fly-carriers may not be shipped out of these areas unless inspected and certified as uncontaminated.

Although this pest infests most of the semitropical areas of the world, it was exterminated completely in this country in 1930, at a cost of \$7.5 million. Then 10 million acres were affected, and the available weapons were quarantine and fruit treatment. Today we have far better tools than were available during the last outbreak.

Research with various fruit flies in Hawaii and Mexico City has led to the development of several new lures and bait sprays. An effective bait, widely used over the past several years, is hydrolyzed yeast protein. However, during the past few weeks,

USDA has been testing a new lure, oil of angelica seed, in the contaminated areas and is elated with the results, which are reported to be far better than with the hydrolyzed protein. Oil of angelica seed is a naturally occurring essential oil, used in the past in the perfume industry. Florida field men are trying to perfect a method for its use, and plan to use it in traps as soon as sufficient supplies are received.

State agencies and private industry have been cooperating closely with the Federal group, but are not yet confident that all infestation has been

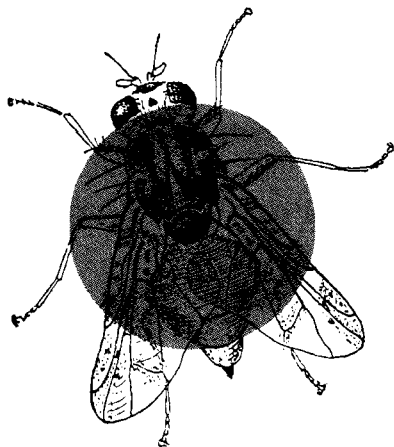
found. They have traps out on a spot check basis throughout the citrus producing areas and at high risk spots such as tourist-gathering points. At present, Medflies have been spotted on parts of 250,000 acres in the Miami area, from Homestead, south of Miami, to West Palm Beach.

Officials are planning to eliminate this pest with a combination of soil treatment and foliage sprays. The latter will be applied as a wettable powder of malathion in combination with hydrolyzed yeast protein or a less expensive bait. This will be applied by blowers and by aircraft in

Inspection of fruit for the Mediterranean fruit fly is a big part of control effort



larger areas, at 10-day to two-week intervals, for as long a time as needed. USDA hopes that three such treatments might be applied by July 1. The present formula applied by aircraft consists of 2 pounds of 25%



The Medfly

malathion with 1 pound of hydrolyzed protein in about a gallon of water. Concentrations will vary with application method.

This will be followed in many areas by soil treatment under host plants using 50 pounds per acre of 10% granular dieldrin. Residual effect of this pesticide is expected to last for a long period of time.

Research people are working hard to improve and reduce costs of attractants, insecticides, and other eradication tools to put a quick end to this infestation. The most recent major result of this intensive effort was development of oil of angelica seed as an effective bait.

Florida and USDA officials are jointly setting up commodity treatments for products moving out of the infested areas. The destruction of infested host fruits is being effectively carried out by the growers after the program was started by USDA-State crews.

Three basic techniques for treating products subject to infestation have been developed by USDA during its Hawaiian experience: fumigation with ethylene dibromide or methyl bromide, vapor-heat treatment, and refrigeration methods. Both fumigation and vapor-heat treatment have been studied for use in Florida, but final fumigation tolerances have not yet been announced. Treatment methods are: ethylene dibromide—8 ounces per 1000 cubic feet, 2 hours, 77° F. or above, or 10 ounces per 1000 cubic feet, 2 hours, 70° to 76° F.; methyl bromide—2 pounds per 1000 cubic feet, 3.5 hours, 80° F. or above.

Different fruits and vegetables are handled under each method. Since citrus fruits can be fumigated with ethylene dibromide, it is likely to be the most widely used technique, and can be expected to require significant quantities of the chemical. Peppers and tomatoes are in the methyl bromide treatment group, while egg plant may receive vapor-heat treatment. Avocados cannot be treated in these fashions, and present plans call for them to be picked in the mature green state, carefully graded, and sent only to northern markets.

USDA has requested \$1.5 million from the Congress for aerial spraying treatments through July 1. Senator Holland (D-Fla.) has introduced legislation, which has been reported out of committee, calling for an additional \$675,000 for the Medfly battle in the next fiscal year. To complement this program the Customs' Bureau is expected to receive additional funds to enable it to resume full baggage inspection at Miami International Airport.

It is impossible to foresee what amount of malathion, dieldrin, hydrolyzed yeast protein, oil of angelica seed, ethylene dibromide and other chemicals may be needed before the Medfly is eliminated from the continental U. S. Should more infestation be found, and if the great commercial citrus areas of Florida are infested, the greater will be the need for these products.

New Potash Ventures

Projects under way in Southwest, Utah, and Saskatchewan — larger farm needs may result from cropping losses

NOT SINCE the Carlsbad, N. M., district was opened to commercial production in 1931 has the potash industry engaged in more exploration and development than at present. Extensive test drilling is continued by several companies in the deep ore beds of Saskatchewan, Canada. Petroleum and agricultural interests jointly plan to work a large new area in New Mexico, and another oil firm is scheduling potash production on a proved acreage in Utah.

This does not mean that the U. S. faces any immediate exhaustion of

major sources for potassium salts in New Mexico's ores and California's lake brines, according to the industry, and government estimates on potash reserves tend to bear out the contention. The prospecting now under way, says a spokesman, is a "normal sound interest" in the industry's future. A company which has sunk test shafts in Saskatchewan says there are certain advantages in having two good deposits as sources of supply.

World reserves of soluble potassium salts are large, but only a minor part of these are in the United States. The "Mineral Facts and Problems" of the U. S. Bureau of Mines says a reasonable figure would be 37 billion metric tons of K_2O , of which some 65% is in Germany and Russia; 23% in Israel-Jordan; 6% in France; 5% in Spain; and 1% in the U. S. These estimates omit Canada, however, as well as the Yorkshire deposit in England which contain 100 to 200 million tons of K_2O .

Domestic Reserves

Our potash reserves in the California and Utah brines alone are placed at 21 million tons, and those largely represented by the sylvite and langbeinite ore beds of New Mexico at from 58 to 80 million tons of K_2O . There are other sources for potassium salts which await economically practical recovery methods. Among them are alunite, carnallite, polyhalite, wyomingite, greensands, porphyry copper tailings, and sea water. Each cubic mile of sea water contains the equivalent of 1,845,000 tons of K_2O , but it is doubtful if any of these sources could yield potash for agriculture approximating the current market price of 36 cents per unit-ton (59 to 63% K_2O) at the mines, bulk.

Efforts to assure agriculture (which takes 95% of the supply) and the chemical industry of their future potash needs, therefore, will be devoted to proved deposits for the most part in the Southwest and Western areas of the United States and Canada. Thanks to the Carlsbad development, chiefly, the U. S. was able to expand domestic production from a little over 60,000 tons a year in the 1930's to almost 2 million tons in 1955.

That same development enabled the U. S. to curtail greatly imports which amounted to almost 1 million tons in 1930, and of which more than one half was supplied by Germany. In the postwar years our potash imports dropped to as little as 16,000 tons, although in recent years they

have expanded as the result of competitive pressure by foreign producers. One Washington view is that increased potash requirements might be supplied in the future by the domestic industry, as they have in the past, but that expanded imports at the same time is also a possibility. There is no tariff on imports of agricultural potassium salts and these factors could conceivably discourage expansion by domestic interests.

Annual Losses

Soil losses of the mineral are figured at about 5 million tons annually through cropping alone. Further quantities are lost through leaching and erosion. Larger potash percentages in fertilizer formulas in the years ahead are likely as a result. The essential role of potassium salts, in promoting healthy plant growth, photosynthesis efficiency, and soil moisture utilization, has been amply demonstrated. For a long time the potash to nitrogen ratio in fertilizers has been 1 to 1. More recently potash has lagged below nitrogen so that the ratio is now more like 0.8 to 1.

After several years of prospecting and exploratory work companies in the new Saskatchewan field find themselves closer to actual production. The Continental Potash Co., Ltd., of Calgary (formerly the Western Potash Corp.), has been able to bring a shaft down to the 1200-foot level. The potash salts in this have been located at 3000 feet.

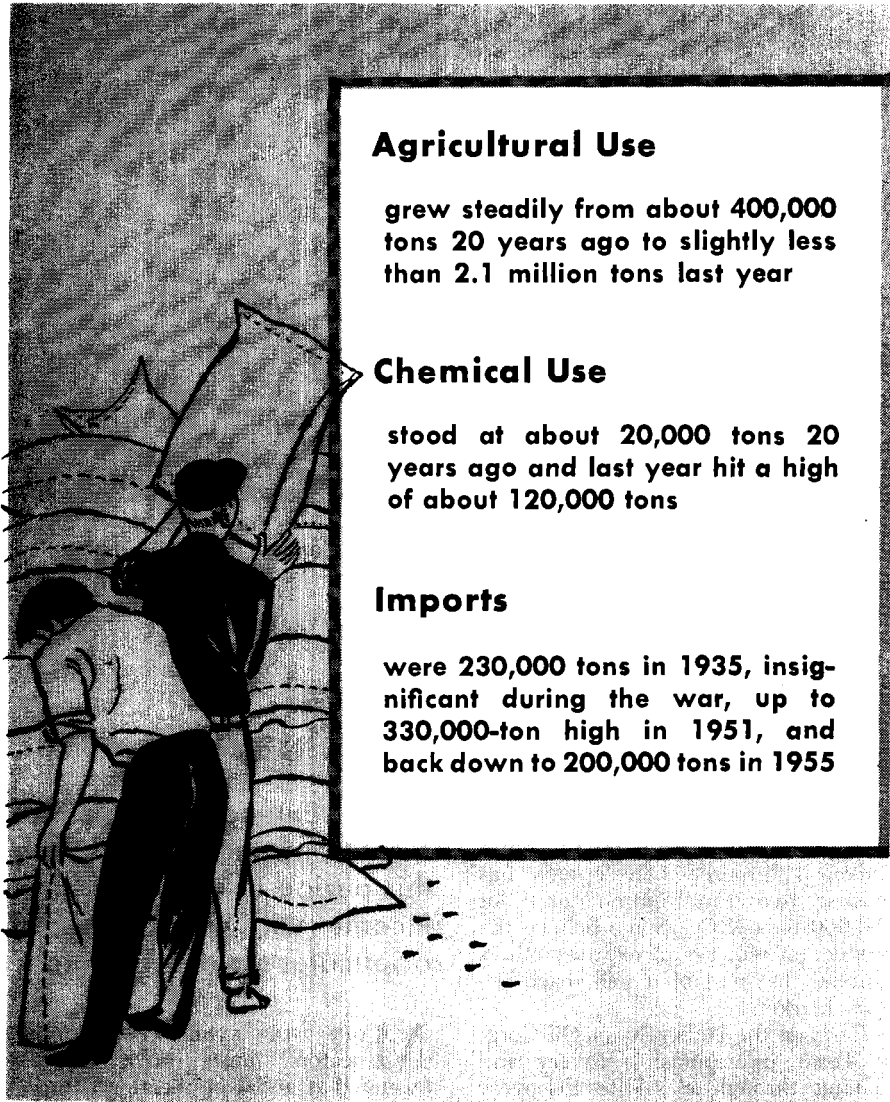
Continental is reported to have an agreement covering preliminary engineering work with F. H. McGraw and Co., New York construction firm. The potash area, estimated at 1480 acres, has been estimated by independent American engineering consultants to contain some 60 million tons of potassium ores.

Potash Co. of America, Ltd., is operating at Patience Lake, which is some 15 miles east of Saskatoon, and is reportedly in the process of sinking a shaft. Other companies said to be interested in the Canadian potash development include International Minerals & Chemical and Duval Sulphur & Potash Co. The Saskatchewan deposits are from 3000 to 3500 feet down, in contrast to 800 to 1000 feet at Carlsbad. Between Unity and the Patience Lake, Sask., area the beds are about 17 feet thick and assay 11 to 24% K₂O. The depth probably should not be overstressed as the only effect is to increase the haul once the shaft is sunk.

POTASH DELIVERIES IN NORTH AMERICA
K₂O basis

1935 400,000 Tons

1955 2.2 million Tons



Agricultural Use

grew steadily from about 400,000 tons 20 years ago to slightly less than 2.1 million tons last year

Chemical Use

stood at about 20,000 tons 20 years ago and last year hit a high of about 120,000 tons

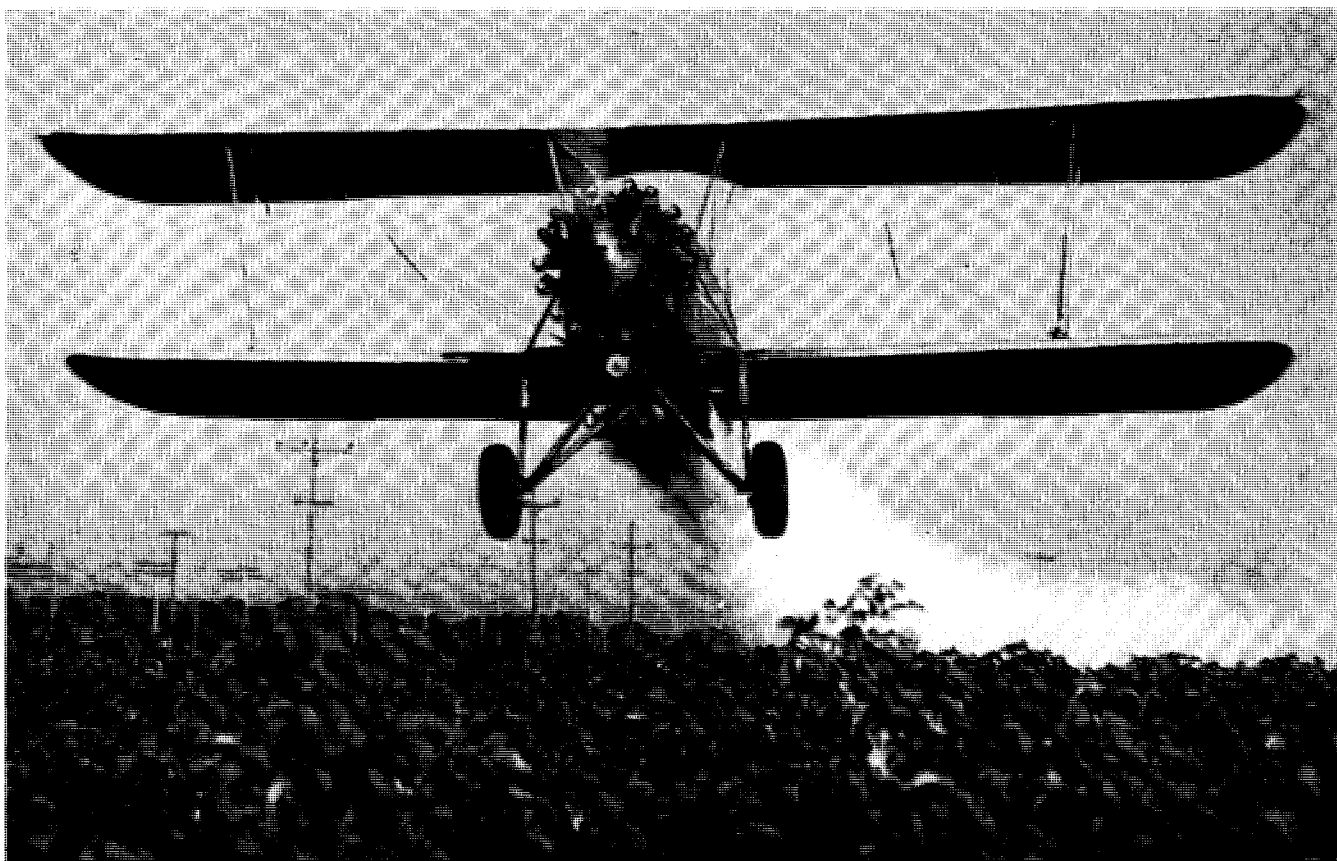
Imports

were 230,000 tons in 1935, insignificant during the war, up to 330,000-ton high in 1951, and back down to 200,000 tons in 1955

In this country progress is somewhat faster. National Potash Co., owned jointly by Freeport Sulphur and Pittsburgh Consolidation Coal, has two shafts in New Mexico on the way down and the new company expects to be in production early in 1957, turning out 400,000 tons of potassium muriate on a bulk basis. The K₂O equivalent is not available.

Farm Chemical Resources Develop-

ment Corp., was formed only recently to mine and process potash on a 13,000-acre deposit in Lea and Eddy counties in southeastern New Mexico. It is owned one quarter by Kerr-McGee Oil Industries of Oklahoma City, one quarter by Phillips Petroleum, and one half by the National Farmers Union, Denver, Colo. Phillips will have the right to one half of the potash produced, and so



Aircraft application of chemicals dropped off during 1954, but early estimates for 1955 show an upward trend

add the third ingredient to Phillips Chemical's agricultural products. The remainder may go to the National Farmers Union, but this has not been ascertained definitely.

On the West Coast it is said that the production target date for Farm Chemical Resources Development has been set two years from now at about 350,000 tons K_2O . Some believe the production will be all captive; others contend that part of it will reach the open market.

Entry of the Delhi-Taylor Oil Corp. of Texas into potash recovery and refining through a sylvite discovery near Moab, Utah, has aroused more than ordinary interest. The petroleum interest has drilled seven large bore core wells for a total of "six miles of hole," acquired water rights and a pumping site on the Colorado River, and plans to get into production in two and a half to three years.

The Utah potash area is in what is known as the Seven Mile Anticline. There appears to be sufficient high-grade ore at shallow depths, according to the company, to assure a 25-year operating reserve on the basis of 1000 tons a day of product.

Aerial Application

Extending use of aerial application during this period of declining farm income will call on aerial applicator's salesmanship

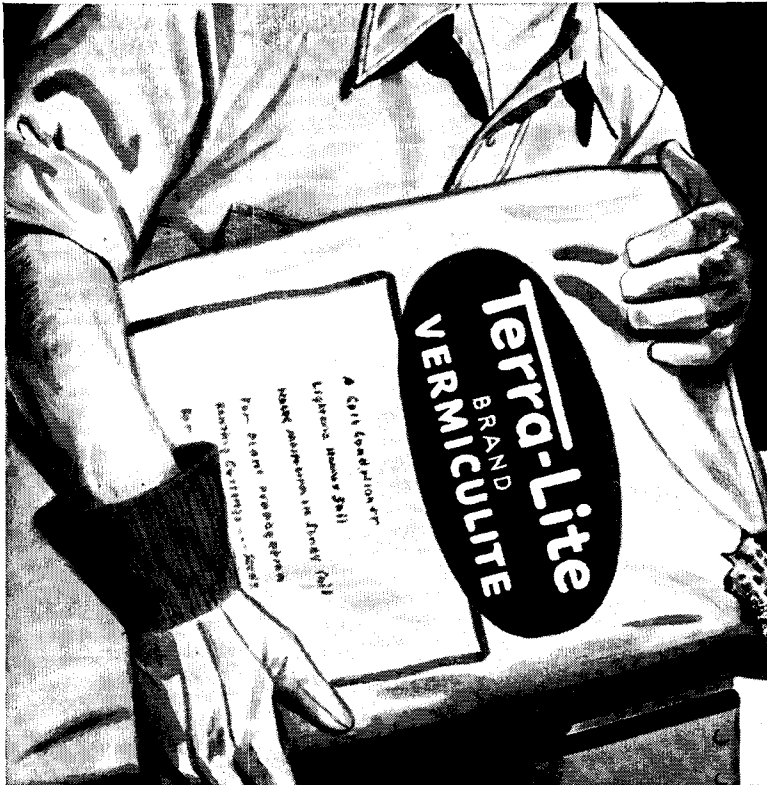
MORE THAN EVER BEFORE, applicators must prove to the farmer that aerial application of agricultural chemicals will pay off. Farm income is not expected to increase to any great extent during the year, and applicators may find difficulty in convincing growers of advantages of airplane dusting and spraying.

To date, only isolated instances of growers' resistance to agricultural aviation have been evident. The most noticeable reaction has been in the Northwest. Some farmers in that area are now more inclined to gamble on a marginal operator who offers cut prices. Along the West Coast, little or no prejudice exists against aerial

application. The only operation affected is alfalfa aphid treatment. Some growers have taken to using ground rigs for this purpose. The South still relies heavily on the airplane, regardless of farm income. Acreages are large enough so that aerial work is a necessity. Only in Tennessee, among the hill farmers, is there a reduction in aerial application. This is due to a reduction in total acreage. But in the delta region of that state, aerial application will probably increase. In the Northeast, no grower resistance has been observed. However, operators in this region do not contract work in advance, but rely on calls as insect infestation develops. Midwestern farmers want to be shown what can be done with aerial application. In Minnesota and other North Central areas, opportunity for aerial spraying of pasture land is unlimited. Although farmers are reluctant to rely on the airplane for this purpose as yet, prediction is that a substantial increase will be seen in the next few years.

The chief problem, therefore, appears to be in expanding the use of the airplane in crop treatment. Sell-

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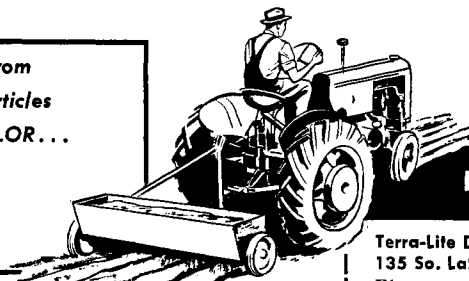
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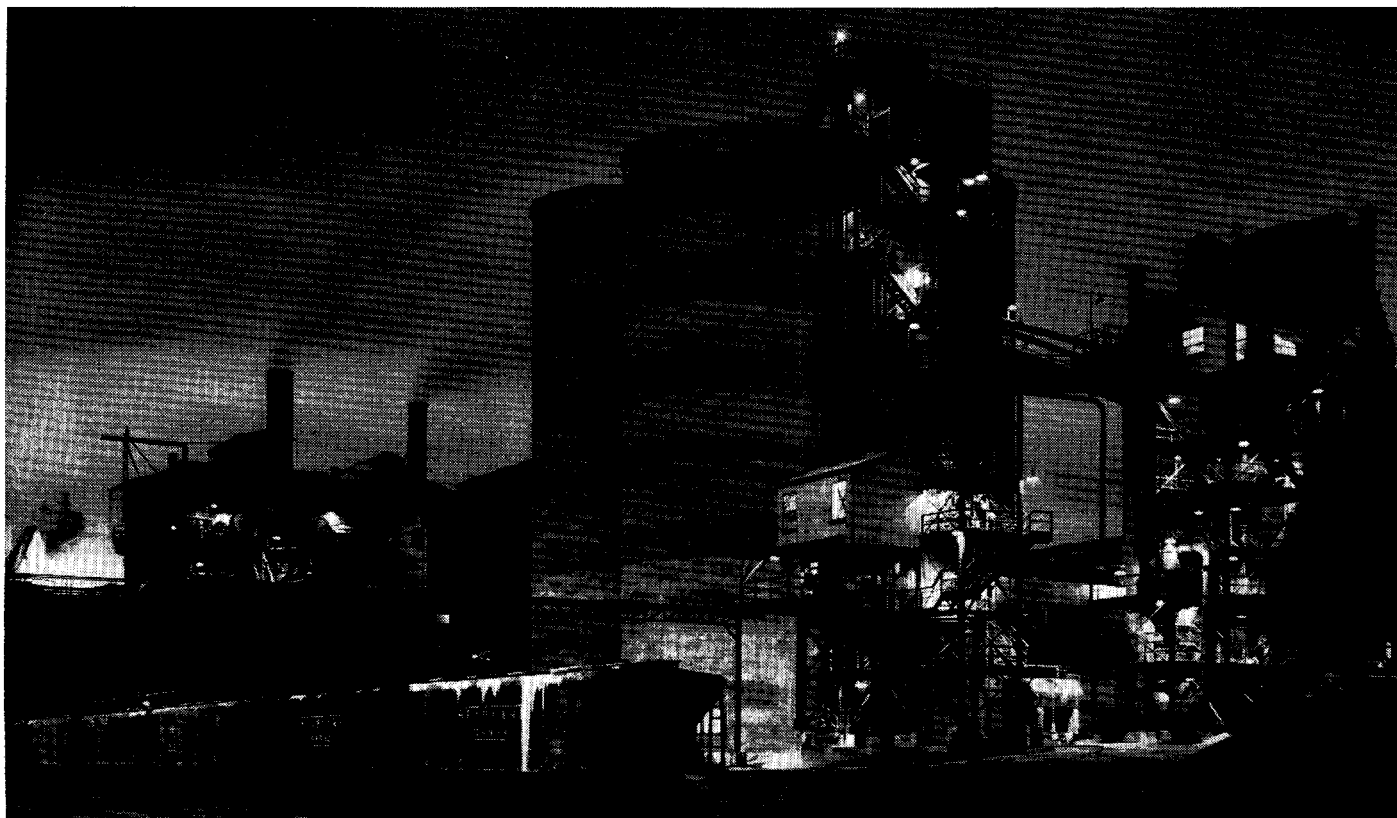
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plant design . . . extra capacity for a dependable supply . . . extra time to complete the five-week natural curing process . . . and extra care and quality control to assure uniform results in batch after batch.

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The reason:

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Yes, in a single year, International has zoomed to a top position as a supplier in the triple super industry. Here's why, in the actual words of Bonnie customers:*

Others have recommended you

"Several nitrogen producers have recommended your product to us because of its excellent ammoniation. They were right."

Missouri

You live up to delivery promises

"What we like about doing business with International is your service, particularly regarding delivery. Our material has always been shipped when requested."

Indiana

Your triple stores better

"Last September, we stored some of your triple next to competitive materials from two other suppliers. Six months later, the other two piles were set up hard enough to be blasted. Any lumps in your product could be broken with your fingers."

Minnesota

Your triple is a better product

"This is the best triple we have ever used for ammoniation."

Ontario

We get better ammoniation results

"We can put 600 lbs. of Urana 10 in with 1,400 lbs. of triple."

New York

Your Triple holds more nitrogen

"We have been amazed with the results. With a very high humidity we have been using 500 lbs. of nitrogen solution with 1,400 lbs. of your triple. Never before have we been able to get over 360 lbs. of this solution in the mix."

Maine

We save money with your triple

"We like the constant high analysis of your product. It aids us in formulation and reduces the unit delivered cost."

North Dakota

You meet delivery schedules

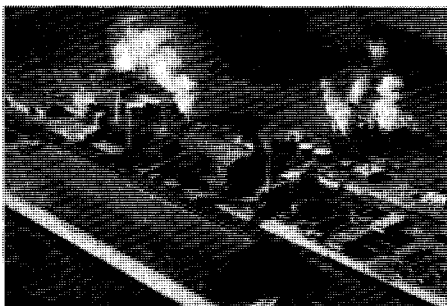
"We certainly appreciate the way International came through on schedule during the rush season."

Arkansas

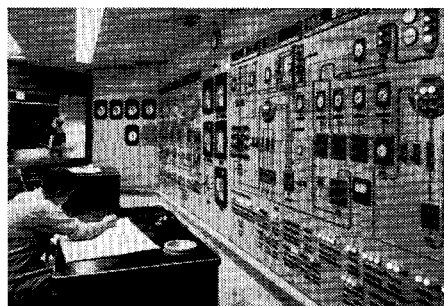
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These are just a few of the reasons why this year, the big switch in triple super sales is to Bonnie — giant production facilities . . . prompt delivery . . . superior quality . . . and outstanding ammoniation results.

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ing aviation to growers can best be done by aerial applicators themselves, chiefly through their methods of operation. They are constantly being watched and talked about by farmers. When operating efficiently with subsequent lower cost, the applicator can demonstrate to an undecided farmer that it is to his benefit to go along with aerial application when a real need arises. The applicator already has a number of strong arguments in his favor. With improved techniques of application and improved insecticides and fertilizers, a better job can be accomplished by aerial application when all factors are conducive to this type of treatment.

Some Price Cutting

Some applicators have tried lowering prices as farm income comes down. But some of them are also rapidly approaching the point of pricing too low to remain in existence. A northwestern applicator found that lowering his prices increased his work volume. However, any further price reduction might eliminate this particular operator from the competitive field.

Several sound methods of overcoming farmer resistance to aerial work can be used. One of the most expensive aspects of agricultural aviation is small volume work. If money were readily available, a farmer with a relatively small acreage may still be inclined to use aerial control on his crops. Now, even with a limited income, profits can still be realized by the grower if his own land is included in a "spraying-ring"—where he and his neighbors have their fields treated in one operation. The National Aviation Trade Association believes that applicators must continue to strive to make operations the most efficient type of application available. If the air applicator can give better and more effective coverage, he should be able to attract an increasing amount of business.

Many applicators, says the association, need some cost analysis guidance. The NATA currently has a certified public accountant and a cost man studying the subject. A possible cost pattern that all applicators can use may result from this work.

For agricultural aviation, additional profits may accrue from increasing aerial seeding of a high vegetation crop where possible (such as rice). More forest spraying is also needed and an applicator with proper equipment can benefit monetarily with this

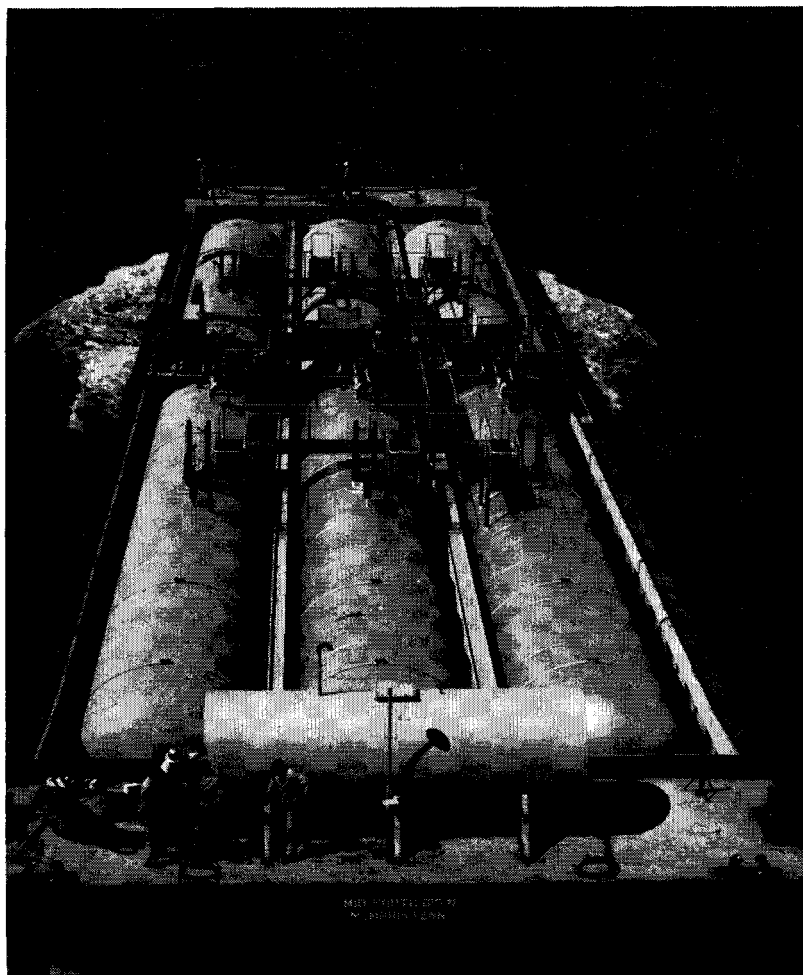
kind of work. Aerial seeding of pasture land, hay, cereal grain, and any seeding that can be done by broadcasting is profitable, and is widely practiced in California. Greater operator profits can result from greater efficiency—more acres per hour through more efficient air traffic and distribution of equipment, and greater efficiency in loading and actual spray or dust operations. A frank discussion between grower and applicator could prove fruitful if emphasis is placed on

gaining a mutual understanding of applicator and grower problems.

When fully developed, granular materials may offer new possibilities in aerial application (AG AND FOOD, April, page 293). Physical characteristics of granular materials offer many benefits in the economically significant area of materials handling. Considerable weight saving is possible in contrast to sprays. In some instances, an aerial pay load of granular material may cover several times

Water Transportation

One of two barges constructed for Mid-South Chemical to transport anhydrous ammonia on the Mississippi River and the Intercoastal Waterway. Each barge has a capacity for about 1000 tons of anhydrous and will be used to ship ammonia from manufacturing plants in Louisiana to Mid-South's terminals at Harlingen, Tex., New Iberia, La., Memphis, Tenn., and Peoria, Ill. From these points, ammonia goes by tank car and tank truck to 200 distributing stations. The barges, called the *Mid-South Big N* and the *Midwest Big N*, were built at Pascagoula, Miss., by Ingalls Shipbuilding Corp.



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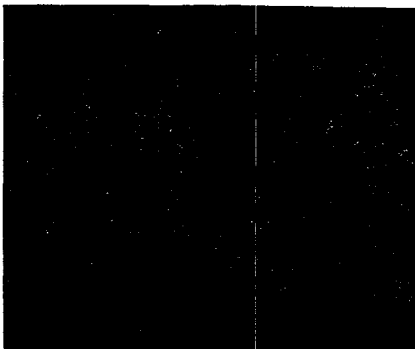
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the area that can be treated with an equal weight of liquid spray based on the same material. The danger of aerial drift is also greatly reduced when using granulars.

The problem of drift is definitely a problem that must be solved for economics' sake. The drift problem manifests itself in several ways. Dust drift is usually more serious than spray drift. In both, however, there is a loss of effective material from the treatment area. Air applicators are coming to grips with the drift problem. Over the past few years, there have been many local, state, and national meetings where drift has been discussed. In addition, the Civil Aeronautics Administration has reiterated warnings and continually recommends good practices.

Fertilizer application by airplane also promises to be a source of income. Although the airplane cannot drill fertilizer into the ground, its use in fertilization may increase because of granular materials. Forest fertilization is another phase of airplane utilization that has not been fully explored.

Since the airplane is a proved farm tool, it is not in any danger of being pushed out of the agricultural picture by tight money. Pest control cost is a very small portion of the entire farm operation. High returns from insect and disease control have been clearly shown. No farmer can neglect or cut down on his pest control problems any more than he can neglect a good job of plowing, fertilizing, or seeding. But to extend aviation's use and resulting benefits to both applicator and grower, it appears that the lion's share of selling must be on the part of the applicator.



HAUL-IT-YOURSELF, now well developed in some industries, is spreading among formulators of agricultural chemicals. Chief reasons for adopting the practice are increased freight costs and a desire to speed

service to customers. Since World War II, rail freight rates have increased nearly 80%. Truck tariffs, too, have followed the same upward trend. Now, with truckers and railroads getting an added 6% rate boost, many firms are driving ahead to do their own trucking or to expand present truck fleets.

May Be Forced Into It

"Truck deliveries are on the increase," says the vice president of a big supply company in the Southeast. "For one reason or another we will be forced into it in due course of time whether we like it or not," he adds.

"We aren't adopting company-owned truck fleets as a general policy," indicated the sales manager of a big basic producer, "but it's strange that you should ask us this question at a time when we are discussing fleets for our West Coast operations. The rate situation out there is becoming difficult."

Service stands foremost behind the interest in trucking among companies that distribute agricultural chemicals. In many cases company-owned trucks do not contribute to profit; they cost more to operate than for-hire trucking services. But competition is a big factor encouraging their use.

Stauffer Has Fleet of 25

Stauffer Chemical, for example, has built up a fleet of 25 trucks in the past five years to ship insecticides from three plants in Texas. Company officials note that their trucks can cut delivery time by days. "Whenever a farmer needs insecticides, it always seems like an emergency, and the locations are isolated spots hundreds of miles away," explained a spokesman in the traffic department.

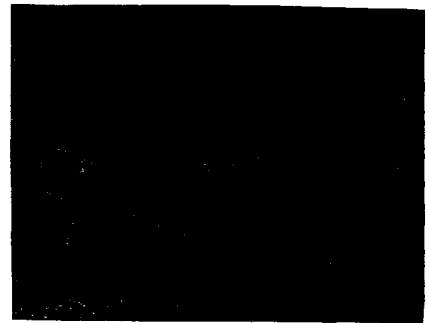
"Sometimes it pays to be small in some areas of the agricultural chemicals business," says an official of a large basic producer. "A little outfit can rush around giving all kinds of service, and the owner can retire to Florida, while the big boys are still figuring out what to do next," he wailed. This remark came from an organization now attempting to bypass formulators.

Common carriers handle most of the trucking for basic producers; it's the formulators and key distributors that go in for company truck fleets in a big way. Unless a basic producer is almost exclusively in the agricultural chemicals business, or unless he sells direct, he can hardly justify operation

of his own trucks. But where products are sold on a delivered price basis, many producers give the purchaser a freight allowance if he picks up the load in his own truck. And this practice encourages formulators to use their own trucking facilities.

Some formulators send their trucks out over a 500-mile run, delivering at a dozen places along the way. They usually arrange to stop by some basic producer on the return trip to bring raw materials back to their plant.

As a measure of how fast company trucking has grown, most of the formulators and distributors engaged in this activity now have fleets two to three times as large as five years ago. Although payouts can become excessive in the agricultural chemicals business, because of its seasonal nature, many people consider company trucks as good insurance against increasing freight rates. With emphasis on service being what it is, company trucking is due for further increases in the next few years.



WHEN THE PESTICIDE SEASON closed last September, the general consensus was that the pesticide industry had just finished its most successful year since 1951. That early evaluation is borne out now that pounds and dollars figures have been published in USDA's "Pesticide Situation."

According to these data, DDT may well have been the key to last year's prosperity. Despite the damaging publicity it has received in recent years because of insects developing resistance, DDT still remains at the top of the organic pesticide list in pounds produced and sold. In 1955, U. S. producers sold 61.8 million pounds of it, highest total since 1951, and exported a record 51 million pounds. Shipments abroad had a value of \$16.2 million and accounted for 42.6% of production. Behind increased domestic use of DDT were severe weevil infestations in southern cotton and federal-state cooperative

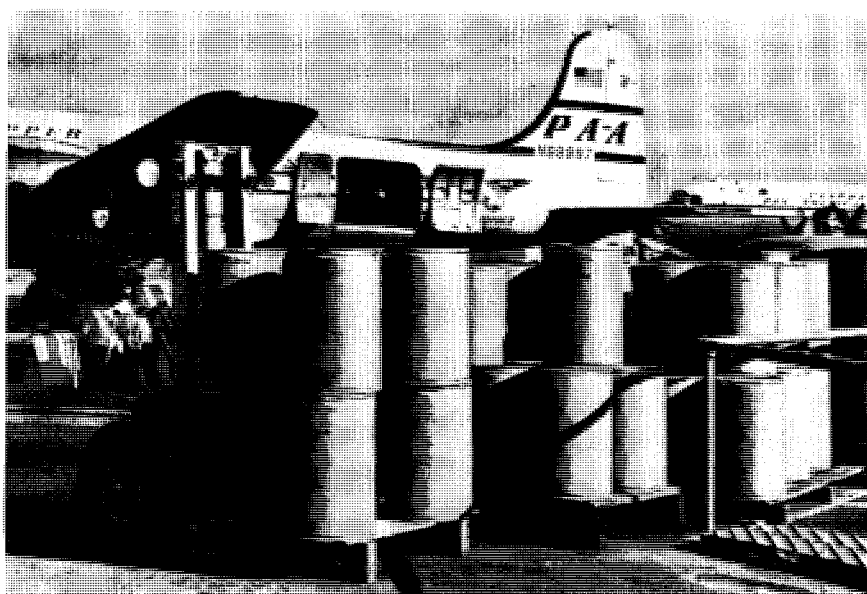
Ag and Food Interprets

projects for the spraying of 2,275,000 acres of timberland.

But also a big factor in 1955 was the other chlorinated hydrocarbon insecticides, which include aldrin, chlordan, dieldrin, endrin, heptachlor, and toxaphene. Production increased about 50% over that of the previous year. The total use mounted to 57 million pounds. In the previous year, use was about 35.4 million pounds. Most of the increase was probably due to a combination of heavy boll weevil infestations in the South and a rainy season that made more frequent application necessary.

BHC Production 12%

Production of benzene hexachloride in 1955 was nearly 12% under 1954, but consumption was fairly high—probably well above that for 1953-54. Inventories of BHC were reduced considerably—on Sept. 30 they were 60% of inventories on the same day a year before. In the five months of October 1955 through February 1956, production of BHC on a gamma basis amounted to slightly under 4.4 million pounds, according to USDA.



High exports during 1955 helped bring up the pesticide industry's total sales. Similar high levels are expected this year, with shipments such as this to Argentina

Another bright spot in the domestic pesticide picture last year was 2,4-D and herbicides in general. In contrast to insecticides, which tend to boom or bust, herbicide use grows

steadily. In 1955, production of 2,4-D was up about 13%. Exports were also up—from 14.8 million pounds (valued at \$5.3 million) in 1954 to 15.8 million pounds (worth \$6 million) in 1955.

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Exports Up \$14 Million

In addition to much higher use of pesticides domestically, the U. S. also exported considerably larger amounts last year. Exports of all pesticides went up by \$14 million during 1955 to a total of \$73,363,000. Mexico took 15.2% of the total, and Canada, 11.6%. DDT accounted for 22% of the total export value.

Developments so far this season indicate it may be almost as good as last. In Louisiana, Georgia, and North and South Carolina, the survival rate of boll weevils is reported at double that of last year. June and July weather conditions will, however, be the deciding factor. Grasshoppers also seem to be more threatening this year than last. The spotted alfalfa aphid is also spreading. Previously found only west of the Mississippi, it has now turned up in Florida, and a bill is being introduced in Congress calling for a \$15 million appropriation to be used for insecticides to control it. The campaign against the gypsy moth is to be stepped to involve the spraying of a million acres. Also favorable is the fact that programs for the eradication of malaria in foreign areas will require large shipments of insecticides from the U. S. for the next few years.