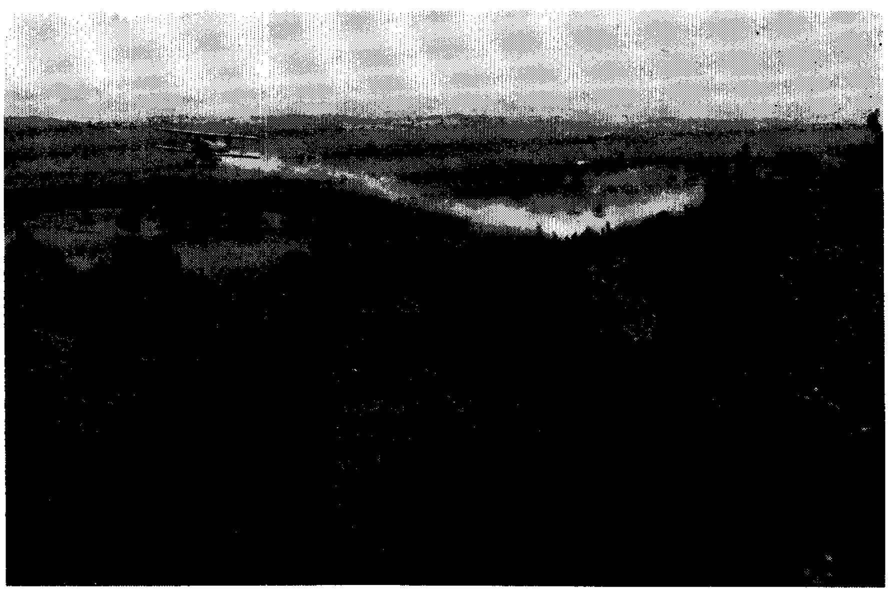
# Ag and Food Interprets . . .

- **Forest fertilization may ease nitrogen surplus**
- **Injecting brush killers into soil shows promise as economic method**
- **Manufacture and use of fertilizer jumps in western Europe**
- **Plenty of room for improvement in foliage fungicides**
- **Chemicals and good housekeeping keep insects out of food plants**



A New Jersey forest gets shot of air-applied fertilizer in a cooperative experiment this summer by Rutgers and Allied's Nitrogen Division. Prospect for such forests: a 40 to 65% increase in wood volume and reduction of pulp growing cycle

## Forest Fertilization

**The potential is tremendous, and it could be an "out" for nitrogen surpluses**

FORESTERS ACCEPTED as a truism, until fairly recently, the statement: "Trees will grow anywhere they can find water." More and more of today's foresters, however, say: "Trees won't necessarily grow just anywhere they can find water—at least not well."

It's almost trite to say good forest management is the answer to waning timber resources. But good forest management in coming days will have a new angle—fertilization.

Actually, forest fertilization can mean many things: It can refer to a few pounds of fertilizer for Christmas trees raised by a small farmer on his south 40, or to larger applications by a commercial grower who may crop several thousand acres. It can refer to practices at thousands of tree nurseries where seedlings are raised to restock logged and burned forests throughout the country. Going a step further, it can mean application to restocked forest lands themselves—or plantations, as they are called. And finally, forest fertilization can apply to the remaining virgin stands of the West.

Not all of these uses offer an immediate potential for tonnage quantities of fertilizers. But fertilization of large forest acreages—plantation acreages—may be closer than is at first apparent. In fact, forest fertilization today appears to be about where range fertilization was three to five years ago—just about to shift from college research to larger scale commercial experimentation.

### *Standard Practice in Europe*

Forest fertilization as an idea isn't new. In fact, it has been standard practice in Europe for some time. Even in the U. S., some segments of the forest industry have fertilized their lands in varying degrees. Commercial Christmas tree growers have been fertilizer users in the past. They are naturals to lead in fertilizer application: high unit crop income to support fertilizer cost; repeated cropping of the same acreage, with obvious nutrient removal; ability to see benefits in terms of increased early growth and improved appearance at harvest time.

Next among commercial outlets already established are the nation's tree nurseries for forest restocking. All of this market isn't being reached, but these people have the same advantages and needs as Christmas tree growers, which the fertilizer industry cannot overlook.

### *Restocked Plantations*

But where fertilization can really come into its own—and where excitement is currently greatest—is on the nation's restocked plantations for saw and pulp timber.

Plantation fertilization can mean not only faster and better restocking; it can also prove to be a major new market for an industry bedeviled by over production and declining prices.

One basic ammonia producer—Allied's Nitrogen Division—has done more than look with awe at nitrogen surpluses, and is ready for its first big push in forest fertilization this fall. Allied-sponsored studies now being completed after five years indicate excellent growth response; economic studies show forest fertilization should be profitable for the forest industry. Some 600 million acres of forests in the U. S. can probably profit from fertilizers, and some foresters put average needs in the 500-to-800-pounds-per-acre range with a 10-10-10 or 12-12-12 grade.

Nitrogen Division considers forest fertilization one of the biggest and most active frontiers now in sight as a new outlet for nitrogen. Basis for its enthusiasm is work under way at Purdue, Rutgers, Wisconsin, New York State College of Forestry, North Carolina, Georgia, University of Washington, and elsewhere. Here's the situation today:

***Bulk of Planted Acreage in Conifers***

Bulk of the nation's planted acreage is in conifers—trees giving greatest wood volume in the shortest rotation period. Proper fertilization can likely reduce the pulp growing cycle by several years and increase wood volume 40 to 65%. First application should go where soils are most deficient to get greatest first response, of course, but fertilizers also offer valuable secondary effects, such as increased insect and disease resistance, and markedly improved seed production. Furthermore, trace element deficiencies, such as in magnesium and zinc, can be offset by proper additions to the mix.

Further stimulation comes from improving what German foresters term the "biogenic nutrient cycle." It works like this: As litter builds up on a forest floor, bacteria in the underlying soil decrease, and the soil declines as a decomposing region. When nutrients, especially nitrogen, are added to the forest floor, the bacteria population increases, decomposition rises, and litter nutrients return to the soil—and eventually to the trees, in a "nutrient" cycle.

Application of forest fertilizers in this country will be by air, requiring high analysis goods to keep costs down. The high analysis goods are already available, and aerial application of chemicals to forests is old hat to many commercial applicators through experience with insecticides (AG AND FOOD, May 1955, page 375). Question is, "What will fertilizer application cost?" One answer comes from Donald P. White at State University of New York. He finds 200 pounds of actual nutrient can be put on each acre for $9 to $13. This cost compares favorably with upwards of $30 an acre for thinning, the present technique for improving stand growth.

Biggest hurdle for the fertilizer industry will not be making plantation fertilization economical, but rather proving to holders of commercial acreages and to government that it *is* economical. Forests are not an annual crop proposition; 15 years may pass before the owner can total up his "pounds of wood for pounds of fertilizer" and see the dollar gain. Fortunately, however, growth response is apparent visually within the first couple of years, and visible improvement may be the industry's biggest selling point early in the game of getting fertilizers accepted on the nation's forest lands.

**This litter covered forest floor is dead. Adding plant nutrients stimulates bacteria, increases decomposition, causing litter nutrients to return to growing trees eventually. German foresters have termed this process the "biogenic nutrient cycle"**

# Application of Brush Killers

## Choice of method for applying brush killers depends on what forester wants to accomplish. Soil injection showing promise in Texas and elsewhere

CHEMICALS have been applied to weed trees or brush in just about every imaginable way: to the foliage, to the bark, on wounds, on stumps, in notches, in frills, and in slits. Any method will work, so long as it introduces enough toxic material into conducting tissues of the tree. Experience with a particular forest is the best teacher, and much depends on whether the forester wants to:

- Eradicate scrub growth in timber land to open up the forest canopy and eliminate competition with desirable trees;
- Kill brush along logging and fire protection roads to keep the roads clear;
- Remove brush from utility and pipeline rights-of-way, and the banks of river channels;
- Remove all woody growth where cleared land is desired for grazing or planting.

Whatever the purpose, many factors must be considered. Some methods use chemicals more effectively than others, requiring a minimum of application. Some methods are easier and cheaper to perform from the standpoint of labor needed. Different species show variations in ability to withstand treatment by different methods. The choice of application method may depend on size of the weed trees, number of stems or amount of brush, quantity and size of desirable trees, availability of suitable labor and equipment, and finally—the end result desired.

As yet, some foresters are not satisfied with the economics of treating small tree stems by any method. Per-plant cost of spray materials can go almost out of sight if a large number of plants per acre is treated. But individual plant treatment is the best known method for working small or restricted areas of brush and for killing scattered plants where broadcast spraying is impractical.

The need for new methods and new chemicals is ever-present. A Crown Zellerbach spokesman says his company is experimenting with various types of chemicals and methods, but has not found anything economically suitable for use against brush species found on its tree farms. But C-Z successfully sprays its logging roads with 2,4-D and 2,4,5-T mixtures from ground power equipment. Soil injection has not yet been tried to any extent in the Pacific Northwest.

California has 20,000 miles of forest roads and 16,000 miles of forest trails. If rapidly growing brush were not controlled, it would make many of these roads impassable every three to five years. Prior to the advent of 2,4-D and 2,4,5-T, foresters continually had to cut away brush or bulldoze rights-of-way. Some areas, as a result of chemical eradication, now will never have to be cut again; the woody plants are permanently killed.

Weyerhaeuser Timber has extensively investigated brush control methods. Company representatives say they need a chemical for hard-to-kill species like the native vine maple.

Soil injection at Texas Agricultural Experiment Station. Workers there say this method cuts chemicals use 25% or more, compared with trunk base spraying

### *Texas Results Successful*

In the South and Southeast where individual treatment of trees is widely practiced, usually by trunk treatment with frills or notches, soil injection may find its place in the sun. (In this area, there is very little foliage application from airplanes.) Foresters who favor basal sprays also may find the Texas results interesting:

- 75% or more of treated trees were killed.
- Per-plant cost of materials is less than that for spraying the trunk base because a lower concentration of herbicide can be used.
- The method works on trees up to eight inches in diameter near ground level.
- Only two ounces of herbicide per inch of trunk diameter is required (oil solutions of 2,4,5-T containing eight pounds of acid equivalent per 100 gallons, or six to eight pounds active ingredient of Karmex W or Karmex FW per 100 gallons of water).
- This method kills post and blackjack oak, elm, honey locust, and gum elastic.

Soil injection is a precise method; the herbicide solution should be deposited where it can contact underground parts of the plant. Wayne G. McCully of Texas Agricultural Experiment Station, who used a model 44 AX Mack's Anti Weed Gun manufactured in Caldwell, Idaho, for experimental applications, says that several other soil fumigating guns on the market are satisfactory. A measured dose is delivered by the soil fumigating gun, eliminating guesswork as to when the proper volume of solution has been applied (as with spray application). The total volume of solution is divided and injected on opposite sides of the tree.

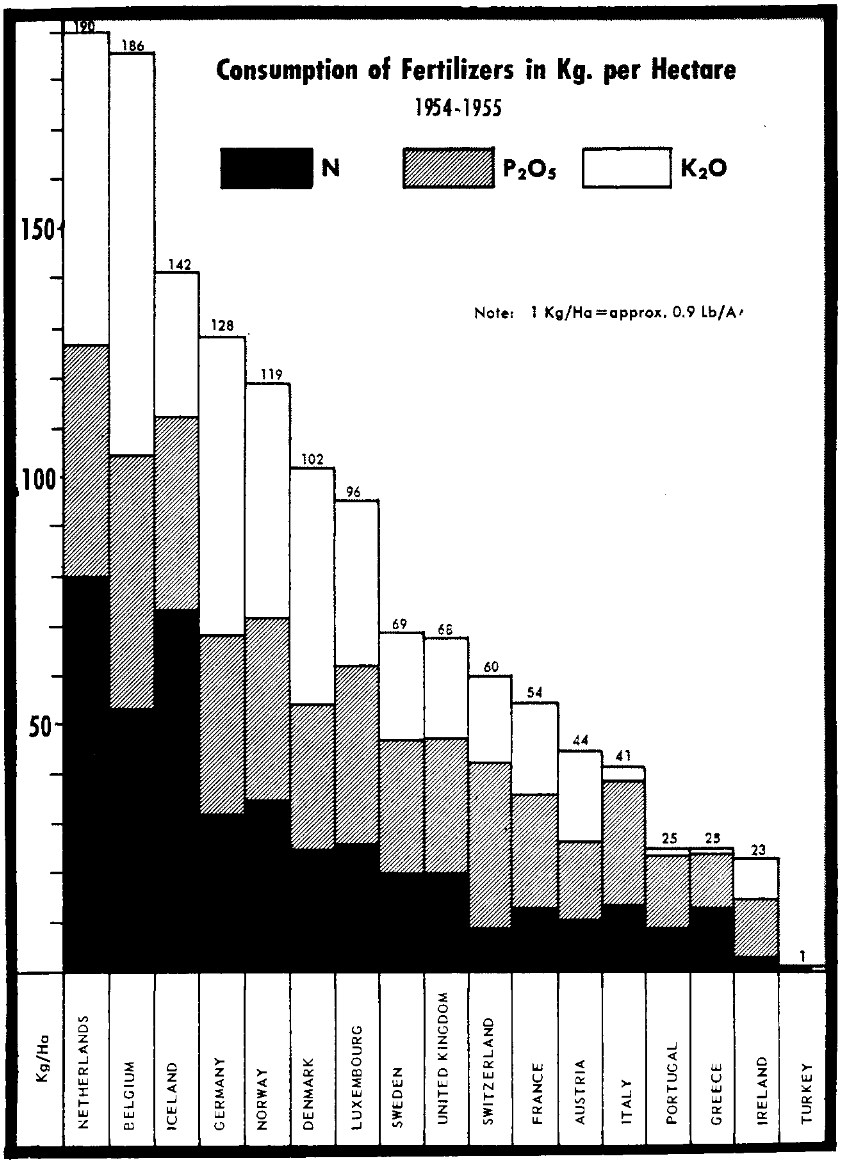
Perhaps the greatest advantage of soil injection is the failure of treated plants to develop basal sprouts. Treated plants die progressively from the top, and when the tree is killed as far as ground level, it dies without sprouting.

The method does have disadvantages. Some operators have difficulty locating underground plant parts exactly for proper placement. Some plants seem to be more easily killed than others; plants also show a definite seasonal response. A USDA spokesman in California doubts that soil injection would work there. The character of root growth encountered on many heavily sprouting plants would make the method impractical.

On the plus side of the ledger, however, lies the fact that soil injection reduces cost of materials for treating one plant by at least 25%, compared with trunk base spraying. And the method kills elm (unaffected by basal spraying) which requires application to a frill or other cut surface.

"We haven't tried soil injection," says a Vermont forester, "but I would like to know more about it. In our area we have to depend upon a man's carrying poison to the tree. Equipment that cannot be moved over rough country, through thickets and slash, and up and down steep slopes, would be useless here." This situation, generally, is faced by many foresters whose areas are too small to warrant aerial treatment and are so constituted that broadcast application from a boom-type ground sprayer isn't practical.

Foresters elsewhere will probably give the injection method a test in the near future.



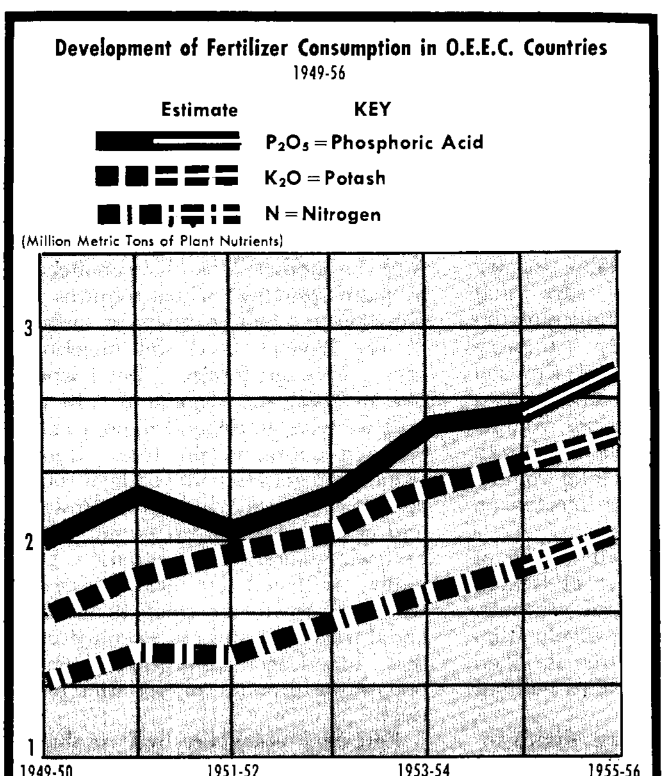

# European Fertilizer

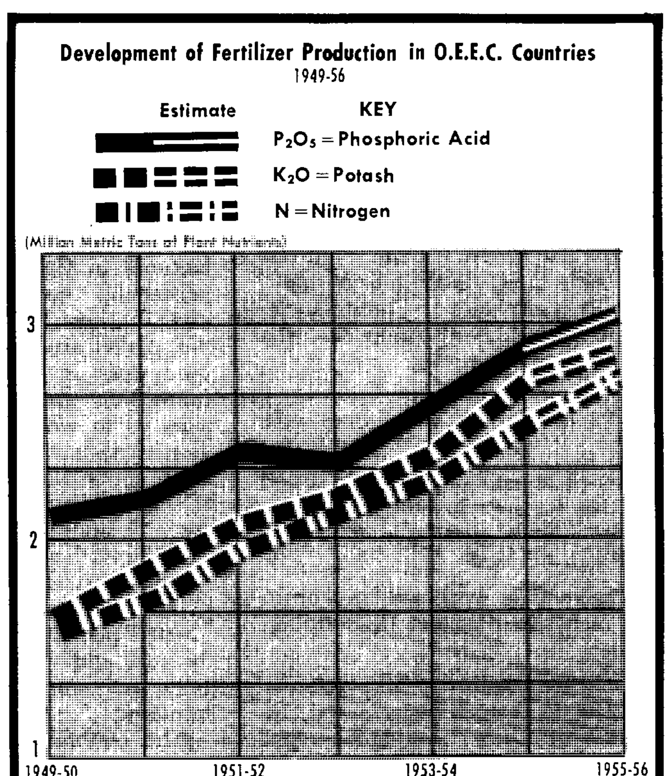
## Both production and consumption of fertilizer increasing in Western Europe

PRODUCTION OF FERTILIZERS in OEEC countries continued to rise in 1954–55 and the rate of increase was higher than that of 1953–54 over 1952–53. Use of each of the three plant nutrients, N, $P_2O_5$, and $K_2O$, is now approaching the 3-million-ton mark. The complete current fertilizer situation is given in "Fertilizers, Production, Consumption, Prices, and Trade in European Countries, 1953–56," recently released by OEEC.

Potash fertilizers showed the largest production increase—15%. Nitrogenous fertilizers showed a 12% jump, and phosphates were up 11%. A year earlier, corresponding increases were 11, 7, and 10%. OEEC says that in general fertilizers have followed the general trend of the chemical industry, which in 1954 showed an over-all increase in production of 15%.

Using the 1949–50 production level as 100, the index of production last year was 170 for potash, 162 for nitrogen, and 138 for phosphates. The lower rate of increase in phosphates production is explained by the



relatively high level of output at the beginning of the period, a slower relative increase in consumption, and limited export possibilities.

OEEC expects production to continue to climb this year. However, the increase will be lower: 6% for nitrogen, 3% for phosphates, and 4% for potash.

As of Oct. 1, 1955, production capacity for nitrogen fertilizers was up 6%, for phosphates 7%, and for potash 11%, as compared with capacities a year earlier. Production capacity was satisfactorily used except that for superphosphates. Two years ago, only two thirds of total phosphates production capacity was being utilized, and the small but nevertheless significant increase here will add to the industry's problems as it is considerably over-equipped. Production of superphosphates in 1954–55 was 6% higher than the year before and is expected to remain more stable this year.

### *Imports Not Big Factor*

Imports of fertilizers into Western Europe are relatively unimportant in the over-all picture. Those of nitrogenous fertilizers, accounted for almost entirely by natural sodium nitrate from Chile, amount to only 3% of total consumption, and there was no change last year from 1953–54. Imported phosphates are only 1.5% of consumption.

Imported potash plays a somewhat more important although not a major role. OEEC countries import approximately 10 to 15% of requirements, chiefly from Eastern Germany. However, Western Europe is a net exporter of potash, and imports are a result of general trade relations rather than any shortage in potash supplies. Imports of potash increased 30% last year.

As a result of bad weather conditions and poor harvest in 1954, coupled with the steep increase in consumption in 1953–54, consumption in the past fertilizer year rose less markedly than a year earlier: nitrogen up 7% (9% in 1953–54); phosphates up 3% (14% in 1953–54); and potash up 4% (11% in 1953–54).

A change is being observed in the ratio in which the three plant nutrients are used. Consumption of nitrogenous and potash fertilizers is increasing more rapidly than that of phosphates. However, total consumption of phosphates is still higher than that of either of the other two nutrients. The average amount of all three applied to agricultural land (omitting rough grazing) was slightly more than 55 kg. per hectare last year.

Exports of fertilizers from OEEC countries jumped 6% for nitrogen and 28% for potash in 1954–55. However, phosphate exports dropped 12%. Producers are increasingly dependent on export outlets, as a result of the more rapid increase in production relative to consumption.

## Survey of European Fertilizer Developments 1954–1955

| | |
|---|---|
| **Austria** | Total consumption increased by 12%; expected to rise by 16% in 1955-56. Use of mixed fertilizers up 60%. |
| **Belgium** | Total consumption down 3.5%. Use of mixed fertilizers increasing but still only 10%. Cost of soil analysis and some other services subsidized. |
| **Denmark** | Total consumption down 6%. Use of mixed fertilizers increasing and demand for potash-superphosphate mixture not always satisfied. |
| **France** | Total consumption up 10.8%; expected to rise 8% this year. Compound materials account for 42% of total. Tax reduced from 9.7 to 7.3% of fertilizer cost. |
| **Germany** | Total consumption up 2.5% for nitrogen, 3.5% for potash, and 13.4% for phosphates. Use of basic slag and mixed and complex fertilizers accounts for increase. No subsidies by government but rail freight rates for fertilizers reduced. |
| **Greece** | Total consumption up 20%. Little mixed fertilizers used. |
| **Iceland** | Total consumption up 17% and further increase expected this year. Now third among OEEC countries in use per acre. |
| **Ireland** | 5% decrease in phosphate consumption. Total consumption expected to rise 12% this year. Ratio of $P_2O_5$ and $K_2O$ to N highest in OEEC countries. High inland price of imported fertilizers a detriment to increased consumption. |
| **Italy** | Potash consumption up 16%. Government grants subsidize up to 35% of cost. |
| **Luxembourg** | Total consumption down 8%. Cost of basic slag (only phosphate fertilizer applied) and nitrogen remained unchanged; potash down 4.5%. Predicted increase for potash this year. |
| **Netherlands** | Consumption of nitrogenous fertilizers up 9%; phosphates down 9%; potash down 10%. Expected to be first to reach total consumption of 200 kg. of N, $P_2O_5$, and $K_2O$ per hectare. |
| **Norway** | No change in total consumption and none expected this year. Mixed fertilizers outlook good. Government subsidizes part of cost of imported phosphates and potash and some transportation cost. Subsidy to farmers with less than 7.5 hectares. |
| **Portugal** | Total consumption down as result of 12% decrease in phosphate. 16% increase expected in 1955-56. Government subsidies paid. |
| **Sweden** | Use of nitrogenous and phosphatic fertilizers down 2 and 5%; potash up 13%. Farmers bought same amount of concentrated potassium chloride containing 50% $K_2O$ as of the less concentrated material containing 40% last year. Loans to money-short farmers expected to increase use this year. |
| **Switzerland** | Total consumption up 10%. |
| **Turkey** | Total consumption up 52% over previous year, chiefly result of increased use of phosphate. Further increase of 23% expected this year. |
| **United Kingdom** | Nitrogen consumption up 3%, potash up 0.5%, and phosphates down 12%, all adversely affected by bad weather. Prices up 3.5% and there have been further increases in 1955-56. Subsidies on nitrogenous and phosphatic fertilizers substantially increased. High proportion of fertilizers used as compounds, with proportion increasing. |

# Foliage Fungicides

**Modern fungicides can control most foliage fungi, but not always economically. Systemics, plant growth regulators could help**

MODERN FUNGICIDES, properly used, will control almost all fungi which attack crops above ground. (Soil fungi, of course, are another problem altogether.) There's liable to be a difference, however, between "control" and "economic control." In this "difference" area lies plenty of room for improving the already very successful fungicides which, since about 1930, have been replacing or supplementing Bordeaux mixture and lime-sulfur, the then standard treatments.

The new fungicides, in general, are organic chemicals. They include bis-dithiocarbamates (zineb, nabam, maneb), thalimides (captan), quinones (Phygon), alkyl dithiocarbamates (Ferbam), glyoxalidines (Crag 341), and half a dozen others. Some are eradicants—use of phenyl mercury compounds on apple scab is an example. Some are fungistatic—they don't kill the fungus but rather arrest its growth. But most, while they may have eradicant or fungistatic action, are primarily protectants. They keep the fungus from getting a foothold but are largely ineffective if applied after it has done so.

A protective fungicide, to do its best, must cover the susceptible foliage or fruit thoroughly. Heavy rain soon after spraying often means respraying to maintain coverage. Or, if the crop is susceptible to fungus attack over a long enough period, normal weathering might reduce the coverage enough to require respraying. When protective fungicides fall short of their goals, then, the cost of maintaining thorough coverage is quite often the reason.

For instance, lettuce around Salinas, Calif., is valuable enough to justify weekly spraying (captan, zineb) to control downy mildew. Wheat, on the other hand, is seldom valuable enough to justify more than one or two sprayings with nabam, which will control certain rusts if used often enough. In the purely mechanical realm, cucumber scab in Connecticut and downy mildew of spinach in California are hard to control because of the difficulty of covering the undersides of the leaves.

Better timing, application methods, surfactants, stickers, and formulations will undoubtedly improve the effectiveness of existing fungicides. Additional improvement might be expected from development of new chemicals, and here some recognized shortcomings of existing products—weathering, for one—point to systemic fungicides.

### Try Antibiotics

Several companies are working with systemic compounds (nature undisclosed) and Oregon State, among other experimental groups, has tested a few of these which look quite active in eradicating existing infections of certain rusts. Others are looking at antibiotics, a number of which are both systemic and fungicidal in varying degrees. Filipin, actidione, and streptomycin are all fungicidal. Boyce Thompson Institute has in its laboratory two antibiotics which are very active against powdery mildew, and a number of others, related to anisomycin, which are effective against rust fungi when applied a few days after infection.

Streptomycin is somewhat systemic, anisomycin much more so. Merck & Co., trying griseofulvin (another antibiotic) on *Alternaria* blight of tomatoes in the greenhouse, found that it inhibited the disease when sprayed on the upper surfaces of leaves whose lower surfaces had been inoculated, and vice versa. The inhibiting effect lasted in some degree for at least a week, and the griseofulvin appeared to move from the upper surface of the leaf to the lower in about 24 hours. One implication is that even a local systemic, sprayed on leaves, might be better than a protective fungicide because it would avoid both weathering and the difficulty of reaching inaccessible parts of the leaves.

Another possibility lies in the fact that the physiology of highly specialized fungi, such as rusts, is tied closely to that of the host plant. Thus even a slight change in the plant's physiology, caused by some kind of growth-regulative chemical, might be fatal to the fungus. Aryloxy acids, for instance, change certain plants' responses to fungi although they affect the roots adversely. The Connecticut Experiment Station, which has worked extensively in this field, says that while some such growth regulators have shown early promise they still have a long way to go.

Actually, the limited amount of current research in systemic and (plant) growth regulating fungicides is just beginning to nibble at the edges of a large body of knowledge that's still missing in the biochemistry of plants and fungi (which are also plants), and in the mode of action of fungicides. For instance, there is no general agreement on the details of how the veteran Bordeaux mixture works. Further progress seems likely to come sooner from present extensive research along the same empirical paths which have led to today's commercial foliage fungicides.

Efficient systemics and growth regulators, if and when they materialize, seem more likely to complement rather than replace existing foliage fungicides. The cost of developing them might even be justified by just one such complementary market, the potentially large one waiting for chemicals—systemic, growth-regulating, or otherwise—which will economically prevent or eradicate the rusts and other fungus diseases which attack cereal crops.

# Insect Control In Food Plants

**Chemical pesticides supplement good housekeeping in food processing plants**

IT TAKES MORE energy and expense than is generally realized to prevent insects from contaminating processed foods and materials that go into them. Proper construction of processing plants and maintenance of high sanitation standards make up the largest part of control programs. But pesticides play an important part in complementing good housekeeping for complete pest control.

Insect control problems in food plants prove complex because of the diversity of raw materials encountered, of final products produced, and of processes used—in addition to the wide variety of insect pests which find food plants attractive living quarters. Possibly a greater problem than actual control is prevention of contamination by living or dead pests or by pesticides used as control measures.

## Ag and Food Interprets

Insecticides can only supplement sanitation and never substitute for it. Obviously, the first step in preventing insect trouble in food plants is to construct the plant so that sanitation requires minimum effort. Equipment should be easy to clean, and so arranged that cleaning around it is easy also. The plant itself should use every device available to prevent pests from entering—tight doors, complete screening, and similar equipment. Plant yards and surrounding areas should be kept free of places in which insects can accumulate and from which they can move easily into the plant.

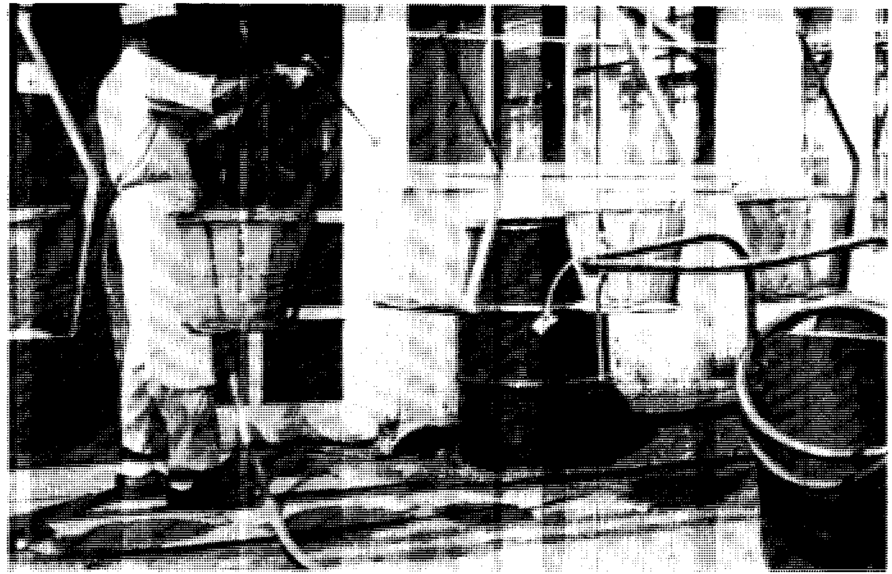
Frequent and complete cleaning of food plants and processing equipment is of tremendous importance in keeping insects away. Any container used to distribute foods from a plant and returned to the plant requires thorough cleaning. Immediate removal of food residues, trash, and unused packaging materials from the processing area contributes to good housekeeping.

A source of trouble in virtually all plants, but a particular problem where dry food materials are processed—bakeries, flour mills, and the like—is dust. Dust may cover residual insecticides, ending their usefulness. It may provide food for insects as well as bacteria. It poses numerous problems for sanitation people, who are always seeking better dust collecting equipment or techniques for eliminating dust at its source. Where even good collection systems leave dust, daily vacuuming and reapplication of residual insecticides complete sanitation efforts.

### *Chemical Control*

Choice of insecticide is obviously important in chemical control. Of equal importance in many instances is the method of application, which must prevent any contamination of foods. In non-food handling areas of plants, residual insecticides find widest use. Water emulsion and oil sprays are often used for residual treatment.

Residual insecticides used in food plants include DDT, lindane, chlordan, malathion, allethrins, and methoxychlor. Often combinations of these insecticides are used for control, especially in plants where presence of several insect species may include one resistant to a particular insecticide. Malathion formerly had an objectionable odor which limited its use although it is an effective insecticide. Recently, American Cyanamid introduced a premium grade of malathion said largely to eliminate its odor drawback. For non-food handling areas, considerable quantities of malathion now go into granular formulations as fly baits.



Spraying baskets of tomatoes as they come into the food processing plant with an alcohol-base pyrethrin emulsion. Pyrethrins are most widely used insecticides

In food handling areas, residual insecticides may be used in locations where there is no danger of direct contamination of foodstuffs or utensils. Sprays containing pyrethrins and piperonyl butoxide (either alone or in combinations known as Pyrenone), allethrin, cyclethrin, or pyrethrum powder are the most common control agents. Other chemicals may be used as synergists with these insecticides. Pyrethrum, probably the first insecticide used in food plants, continues to be most widely used. Its only drawback—high cost—continues to stimulate research for cheaper substitutes and better synergists which will reduce required quantities while maintaining efficiency.

### *Fumigation*

Aimed largely at preventing pests from entering food plants, fumigation practices require large amounts of halogenated hydrocarbon pesticides. Fumigation is generally agreed to be a poor substitute for obtaining insect-free raw materials, but in view of the great difficulty in obtaining uncontaminated materials, many governmental agencies approve fumigation.

Bakeries of all types and flour mills face serious problems in combating infestation of incoming flour and grains. Pests in these raw materials come from improperly cleaned cars, improper storage practices in elevators, and over-long storage periods caused by the grain surplus. Grain fumigants include ethylene dibromide, ethylene dichloride, and carbon tetrachloride formulated for fire and explosion safety, economy, and efficiency, or gaseous materials such as hydrogen cyanide or methyl bromide.

### *New Developments and the Future*

Thermal aerosol generators and large size aerosol bombs for application of insecticides seem to have aroused greatest interest among new developments. These may bring a return in popularity of space spraying, which has lost favor because of contamination dangers and often poor efficiency.

New dust formulations continue to appear, and are recommended for inaccessible places and for areas around electrical wiring where liquid sprays may present hazards. New wetting agents, emulsifiers, and other surfactants aid in tailor making pesticides, a more and more important side line for formulators.

Irradiation for pest control in food plants is of great interest, but is as yet little used because of its high cost. Even if used only on so-called special luxury and fancy foods, irradiation at present costs would price these foods out of the market. Several entomologists and sanitation control officials for food processors say irradiation has great potential, but in addition to the cost problem, handling techniques, hazards, and off-flavor development need more understanding. One consultant offers a rough prediction that it will be five years before irradiation finds industrial use, for example, in grain pest control.

Consumer demand for prepared or ready-to-cook foods grows at a rapid pace, bringing with it continued expansion of food processing plants. And even though pest control in food plants is 95% sanitation and 5% pesticides, still, food processing plants will provide a significant and increasing market for pesticides.