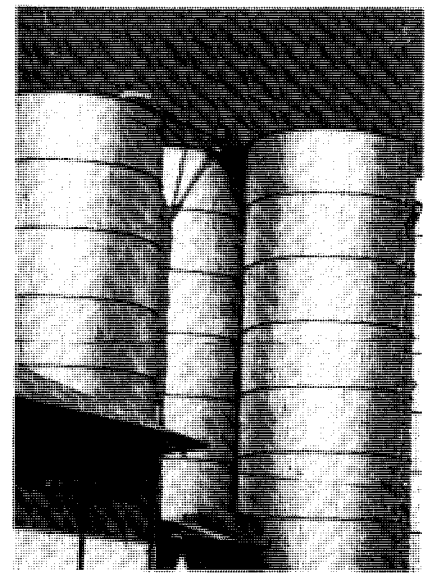
Ag and Food Interprets . . .

- **Protection of stored crops receiving greater emphasis**
- **Technical institutions major factor in fertilizer acceptance**
- **Major export possibilities seen in potash market**
- **Industry moves toward uniform ammonia equipment safety**
- **New crops reaching commercial level in some areas**
- **Nonmuriate potash salts growing in volume**

Protecting Stored Crops

Need seen for action at farm storage level to cut losses and meet stepped-up vigilance of government agencies



THE STEADY increase in volume of stored crops during the postwar period coupled with the recent government clamp-down on infested grain and toxic residues puts the spotlight on current protective practice. The trend is to encourage more protection at the farm storage level. Producers of crop protection chemicals, through their sales programs, are emphasizing correct farm storage and handling procedures.

On the government side, both the USDA and the FDA are actively interested in the proper protection and treatment of food crops. The USDA is responsible for educating the farmer. It also has a big financial stake in this problem of grain protection; the Government is, in effect, the largest owner of grain in the country (and probably in the world). Estimated stocks of wheat held by the Commodity Credit Corp. as of May 25 exceeded 966 million bushels. In the holds of the moth-balled fleet alone more than 71 million bushels of wheat have been stored.

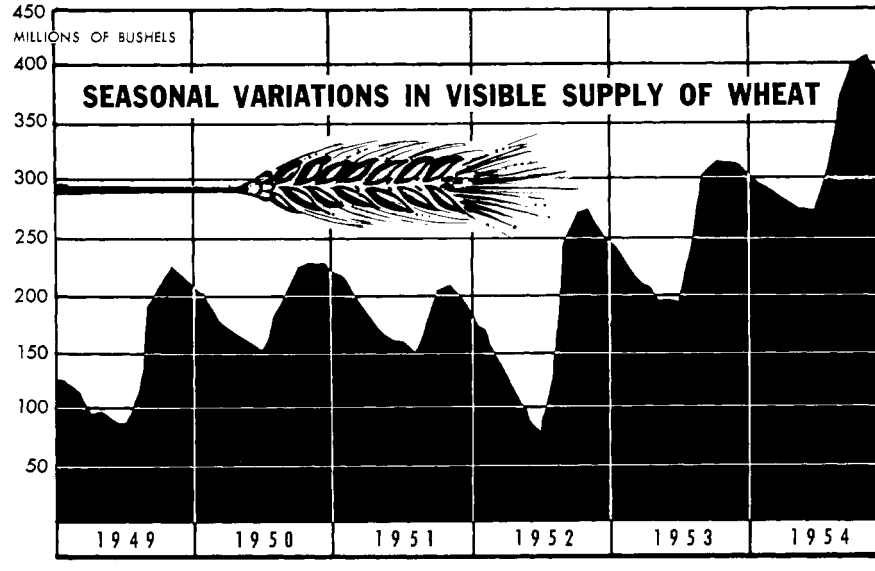
The FDA has recently ruled that wheat containing more than 1% infested grain is unfit for human consumption. At the same time the agency is pledged to protect the public from any toxic residues that may arise from fumigation or other treatment of raw grains. The big problem is one of inspection and enforcement.

There has been little change in the past few years in the basic chemicals used for protecting stored grains. Most important active agents are still methyl bromide, HCN, carbon disulfide, ethylene dichloride and ethylene dibromide. Carbon tetrachloride is added to formulations containing carbon disulfide or ethylene dichloride to reduce flammability. Carbon tetrachloride can be used as a fumigant alone.

Most companies are seeking approval of their products by Underwriters Laboratories and there is apparently a hot race in the research laboratories to uncover new and more suitable flame inhibitors. Sulfur dioxide is frequently used as an activator in carbon disulfide-carbon tetrachloride formulations. Stauffer Chemical by arrangement with American Cyanamid has recently started marketing mixtures containing carbon tetrachloride and acrylonitrile.

Cyanamid is now making available for farmer use a fumigant which in the past was used only in the larger terminal warehouses. It is a granular product which liberates HCN gas when exposed to moisture. The company has developed an automatic gravity feeder which is attached to the auger or loader and measures an accurate amount of the granular product into the moving stream of grain. Company estimates fumiga-

Supplies of wheat and other grains in storage pose a tremendous challenge and opportunity to agricultural chemicals



SOURCE: Chicago Board of Trade, Visible Supply of Grain Statement of stocks of domestic grain available at warehouses and prominent grain centers of the U. S.

tion costs by this method at one-half to one cent per bushel.

Fairfield Chemical Division, Food Machinery and Chemical Corp., announced this spring new oil-free emulsion sprays for stored grain protection. These sprays are formulations of pyrethrins and piperonyl butoxide. Fairfields W. E. Dove reported during the Cincinnati ACS meeting field tests using a standard concentration of 2% piperonyl butoxide and 0.2% pyrethrins in oil-free emulsion. Satisfactory results were obtained using 5 gallons per 1000 bushels of grain.

War on the Khapra Beetle

More than thirty species of insects are known to attack stored grain. The latest one to appear in the United States is the khapra beetle. To fight this newest pest, what is believed to be the largest grain storage building fumigation program is now under way in California, Arizona and New Mexico. Methyl bromide gas has already been used for this purpose in 15 large California warehouses. It was in Tulare County, Calif., that the khapra beetle was first found in 1953.

In an elaborate test in January the beetle was eradicated from a large warehouse at Imperial, Calif., using 2½ times the methyl bromide dosage and 12 times the exposure duration normally required for the exposed khapra beetle (see also AG AND FOOD, March, 1955, page 192).

Since then, cooperating states and operators of warehouses concerned have borne the cost of eradication with assistance from the USDA. Some warehouses yet to be fumigated contain as much as 6 million cubic feet of space; some have stacks or tanks rising 135 feet. Khapra beetles have been found by control workers in warehouses 21 feet deep under solid masses of grain and crawling on bags of insecticides. They have worked their way through a two-foot brick warehouse wall.

Under quarantine against the beetle as of April 30 were 116 locations in California, 52 in Arizona, and 4 in New Mexico. USDA officials expect infested warehouses in New Mexico to be cleaned up almost immediately. A second survery of farm storage facilities in suspected areas is under way. Surveys by Agricultural Research Service workers cooperating with state departments of agriculture have been made in parts of Texas and Louisiana, and are now under way in Colorado. They will be extended to other states.

Irradiation Possibility

Preliminary designs of possible equipment for irradiating grain have been worked out by American Machine and Foundry Co. It has been established that radiation will kill or make sterile insect pests in grain. AM&F's William E. Chamberlain says that his company's preliminary studies indicate that radiation meets the requirements of the ideal de-infestation system: low cost, effectiveness, and flexibility of application.

Preliminary designs include both mobile and semi-mobile crop irradiators for grains. The mobile irradiator might be built into a railroad car for treatment of grain at the elevator. The semi-mobile or fixed unit is designed for use permanently within a grain elevator. The mobile crop irradiator for grains includes a dehumidifier-separator which simultaneously drys the grain and segregates insects and other foreign objects.

Irradiation can't be considered a solution in the near future because general acceptance must await long term tests on the effect of this type of treatment on food products. At a recent meeting at Brookhaven an official of the FDA offered his personal opinion that it would take from 5 to 15 years to accumulate enough data to establish beyond reasonable doubt the safety of consuming irradiated food crops.

Future Market for Stored Crop Protection Chemicals

The volume of grain fumigants sold in recent years has been approximately three million gallons. How high this is going in the next few years seems to be debatable. A conservative estimate forecasts an increase of one third in the immediate future. One midwestern distributor anticipates that the market for grain sanitation products, fumigants, and residual sprays will double within the next two years.

Losses caused by infestation of stored grains are serious. Some estimates place this annual loss as high as 150 million bushels. There is a rich reward awaiting the chemical manufacturer who can develop and sell *the farmer* on a highly satisfactory product—one that will cut this loss with no damage to the grain and at the same time lend itself to easy and safe application.

Fertilizer Acceptance

New fertilizer practices gain farmers' confidence most effectively through technical agencies' advice, according to Iowa findings

WHAT CAUSES a farmer to use modern fertilizer practices? What sources does a farmer use to get information on new fertilizers as they become available? These are the questions many a company would like to have answered; they are all important in designing a policy for successful marketing. These are also the questions that Iowa State College and the Tennessee Valley Authority set out to answer in 1953 survey of Iowa farmers.

Briefly, the most important findings of this survey are: other farmers, chiefly neighbors, are the most important source of information influencing the acceptance of fertilizer use; and Iowa farmers go to the State College and other public agencies to learn about a new fertilizer.

In making their survey, Iowa State people interviewed 532 farmers. They used a random sampling technique designed by the ISC Statistical Laboratory in such a way that every farm within the population had an equal chance of being selected. Personnel from the Statistical Laboratory conducted the interviews, and members of ISC's agronomy, sta-

Comparison of sources responsible for the first use of fertilizer (on the left) and sources used to secure information on a new fertilizer (on the right). Over half of the farmers credit neighbors, friends, and other farmers as the most important causative factor in their adoption of fertilizer. This does not preclude the possibility that they had information from other sources, but it does reflect the important contact or medium which they recalled in arriving at their decision. By far, the largest number of farmers seek out public agencies for information on a new fertilizer