

To the safety and regulatory objections raised, pesticides manufacturers point out that mixtures offer a safer way for the farmer to handle insect toxicants. Most insecticide-fertilizer mixtures contain about 0.5 to 1% of the insecticidal chemical, whereas conventional insecticide preparations may incorporate from 10 to 75% of the same toxicant. Too few individuals realize the extent of detailed investigations with regard to the safety of mixtures. Studies over a period of four years have demonstrated that addition of insecticides to fertilizers does not injure beneficial soil organisms. With regard to regulations concerning crop residues, translocation, flavor changes, and the like, these must be complied with before an insecticide is ever used to control soil insects—thus it is immaterial whether the chemical is applied directly to the soil or with a fertilizer.

Dr. Berry feels that the only noncontroversial claim supporting use of fertilizer-pesticide mixtures, is that based on the economics of the practice, but even here agreement is not complete.

John D. Connor, Washington D. C. attorney, reminds fertilizer-pesticide mixture manufacturers that the pesticide industry has been "plagued" with a heavy volume of product liability claims. Liability claims arise, in his opinion, because of three basic deficiencies on the part of the manufacturer. First of these is failure to conduct adequate research prior to marketing to determine a product's capabilities and limitations and the manner in which it can be properly and safely used. Another is failure to use adequate production controls or methods to assure that the actual product accords with the company's standard product—production of mixtures may present production and control problems not encountered in normal fertilizer production. A third deficiency may come from failure to label or advertise the product in accordance with laws and regulations.

Chairman of the NPFI panel, M. V. Bailey of American Cyanamid, suggested that those who will render the most service to customers in this connection are those who can approach the problem not as something unpleasant, difficult, and expensive which should be avoided as long as possible, but as an opportunity to produce something the consumer wants or can use to his advantage.

Predicts Increased Use

K. D. Jacob, USDA, predicts that consumption of mixtures will increase, especially in the North Central region. He anticipates an increase for most of the states except those in the West South Central region. Even in that region it would not be surprising if further research leads to increased use.

Fertilizer Pump

Low cost pump means small farmers can apply liquid fertilizers

THE SAVINGS to be realized by putting fertilizers into liquid form are in many cases offset by the costs of application of liquids. This is especially true in the case of small acreage farmers. Liquid application equipment is considerably more expensive than that needed for dry fertilizers. Provisions for application of dry materials are often incorporated with the farmer's row cropping equipment.

There has been a logical point at which investment for application equipment would offset the savings to be obtained by application of liquid fertilizers. In many areas this problem has been met by the custom applicator who in some cases contracts to apply a certain amount of nutrient per acre, the farmer paying for the fertilizer when it is in the soil. The custom application trend has been especially strong in the West, where application equipment for anhydrous ammonia application can only be purchased by large landowners or professional applicators.

A new application device developed by USDA and North Carolina State College, is now being commercially produced in North Carolina. Big advantage of the new pump unit is low cost. A farmer can purchase a pump unit for about \$150 and attach tank and spray booms himself resulting in a complete application unit for an initial cost of less than \$200. Only comparable commercial pump sells

for about \$300 and that is cost of pump unit alone.

The pump unit consists of a number of lengths of plastic hose placed around a four-roller reel. The reel is connected to a ground wheel by a chain and sprocket drive or directly to a tractor axle. As the reel turns, the hoses are compressed exerting a pumping action on the liquid passing through them. Rate of pumping of application is governed by speed of the tractor; the pump thus delivers a constant rate of liquid per unit of length traversed and application rate is constant despite changes of tractor speed.

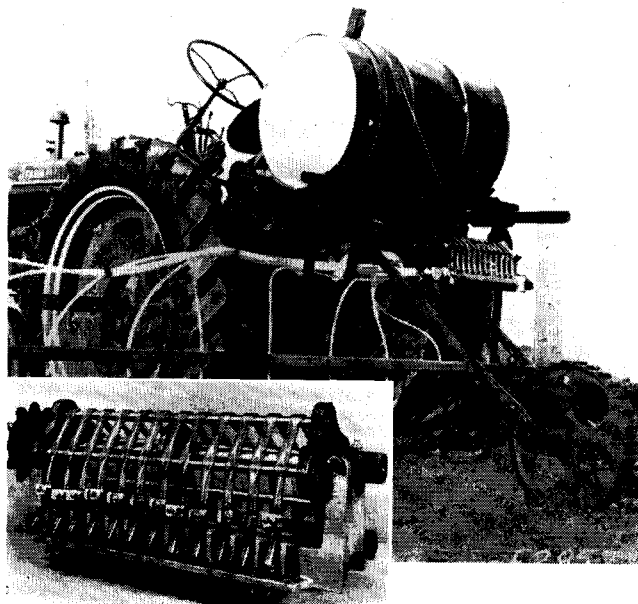
Commercial Unit Perfected

The commercial unit has been perfected from a design developed at the University of Tennessee Research Corp. The university still holds the patents but has assigned exclusive manufacturing rights to Liberty Mfg. Co. in Red Springs, N. C. Principal change in the old design was substituting plastic for the original rubber hoses.

Agricultural engineers, agronomists, and fertilizer manufacturers have come to realize the need for lower cost equipment for application of liquid fertilizers. Many small farmers, working less than 50 acres, could not afford expensive equipment for applying liquids themselves and were faced with the problem of either having it applied on a custom job basis or paying higher unit plant food prices for dry fertilizers.

The economic study was based on the relationship between relative costs of plant food units and application equipment for dry and liquid fertilizers. Labor rates were assumed to be the same for application of either dry or wet fertilizers.

Pump action is dependent upon tractor speed; roller is connected either to ground wheel or tractor axle. Rate of application is constant despite changes of tractor speed. Pumping action is due to alternate compression of the plastic tubes



Ag and Food Interprets

The North Carolina study presented a graphical relationship between the amount of land fertilized annually and the amount of money which the farmer can spend for application equipment. As a result of this analysis, the study concludes there is a "breakeven acreage," a point at which a farmer will save money if he buys his own application equipment compared with custom application. Above this acreage, farmer dollar savings will increase if he applies liquid fertilizer himself.

Economic Study Promises Market

A cooperative development project was undertaken by USDA and North Carolina State College to achieve a lower cost method for dispensing liquid fertilizers. The inexpensive pump was the result. Production costs, however, turned out to be substantially greater than originally anticipated. An economic analysis was made to determine if a substantial portion of the farmers could afford to purchase the device.

Liberty Mfg. Co. assisted the research agencies in the original field tests and first began producing the pumps commercially in 1954. It now appears that the market for the pump far exceeds that implied by the original analysis. However, Liberty has not been able to meet the demand for the pumps and has licensed the Krause Plow Corp. of Hutchinson, Kans., to manufacture them next year.

It seems that the larger market for liquid nitrogen may be developing in the corn belt of the middle west. Krause will manufacture the pump in Kansas, more nearly the center of the country. Under the agreement, Krause will put its larger engineering staff on the problem to adapt the pump to mass production techniques, probably resulting in a further reduction in cost. Present plans are for production of about 1000 pump units per month.

Krause is already in the farm equipment business and will also be able to provide a distribution system for selling the pump throughout the country.

Paramount Interest to Fertilizer Industry

The development of this pump and the widespread marketing it will receive next year may well be of paramount importance to the fertilizer industry. For if the anticipated buyer's market for nitrogen develops within the next few years, the device developed to aid the small farmer in North Carolina may be an important distribution factor for producers of nitrogen fertilizers, liquid anhydrous, and dry throughout the Middle West.



As the Miller Amendment goes into effect, Rio Grande Valley farmers ask for inspection system operated at point of shipment rather than at markets. They fear long distance disposal problems in cases of contaminated shipments

Miller Amendment

Growers, confused about regulation, say they need more clearly defined information for growing clean food crops

WHEN CONGRESS passed the Miller Pesticides Amendment, the law was hailed by many as the answer to problems of regulating residues. Many experts agree on the necessity of having these regulations, although some say the bill is not yet the final answer.

One Eastern company spokesman says the bill is definitely slowing down progress in the development and successful introduction of new pesticides. Another producer says the bill may dampen enthusiasm for the introduction of new pest-control materials.

From another company comes the comment that the officials of the Department of Agriculture and the Department of Health, Education, and Welfare have not given the pesticide industry a suitable set of interpretations for what exactly is needed in registering tolerances under the new bill. Some of the indefinite answers given by these government agencies appear to be causing confusion in the industry.

A spokesman for a major pesticide concern believes the Miller Bill will be

effective in the long run. It obviously has created problems, he says, but these are not insurmountable. Another observer comments: "It is entirely too early to see how effective this legislation will be. Although it has created certain problems, we have been able to adjust to them promptly because we had already been doing the fundamental work."

How Westerners View the Miller Bill

A Western state official says:

"One of the most serious problems from this state's viewpoint is how to get tolerances established for a particular pesticide on all the crops on which it may be used. Pests move from one crop to another without giving due notice so hearings can be held to establish a tolerance for the different crop. If a chemical company isn't interested in filing a petition and paying fees to have tolerances set on each individual crop, what is the farmer to do? We have operated on uniform tolerances here in the past and we had hoped some similar arrangement could be developed on the federal level."

A company executive in the West says the major criticism "is that it does not single out the relatively nonpoisonous compounds and give them a clean bill of health without much red tape. Instead, it seems to apply the same yardstick to every chemical, whether highly poisonous, hazardous, dangerous, or nonpoisonous. The cost to industry is terrific."

People in the Southwest generally are confused rather than optimistic now about the bill's soundness and usefulness. Most of the optimism, they say, exists with USDA and FDA in Washington.

Some leaders in the industry have said the attitude of government officials is generally helpful, but cautious—perhaps too cautious about translating the law into practice. They say it was a serious mistake to set July 22 as the effective date, that postponement of the date seems to indicate USDA and FDA have not completely solved their administrative problems (AG AND FOOD, August, page 642). Chemical sales have been affected adversely in some areas due to early establishment of the effective date. And confusion has reigned at the state and grower level. Perhaps the better move, according to some authorities, would have been to put the law into effect at the end of the crop season, not in the middle of it.

Farmers in the Rio Grande Valley of Texas understood that vegetables shipped out of the area would not be inspected for residues until the vegetables reached the market, which they say is a hazardous operation. Valley growers seem to favor a regulation or inspection system