

## Pa. sludge is safe for farm 'fertilizer'

UNIVERSITY PARK — With proper precautions, sludge from many Pennsylvania sewage plants can be used to grow corn without harming the food chain, says Dale E. Baker, soil chemist at Penn State.

Baker bases his comments on several years of field studies applying sludge, plus tests of sludge from 50 sewage treatment plants in industrial areas where toxic levels of heavy metals might occur.

In 37 of the 50 sewage treatment plants, heavy metal contents in sludge were low enough to avoid harmful effects on the food chain, he affirmed.

Certain municipalities and sewage haulers in Pennsylvania have permits from the Department of Environmental Resources for land application of sludge. Officials and haulers are required to test the sludge composition periodically to determine levels of plant nutrients and trace metals. In addition, records must be kept of spreading locations and rates of sludge applied.

"We recommend that sludge should be analyzed more than once a year, preferably every three months," Baker stated. "Above all, the soil receiving sludge should be tested at least once yearly for cadmium and other metals including copper, chromium, lead, nickel, and zinc."

Until chemical analysis proves otherwise, it is advisable to think of sewage sludge as potentially harmful when applied to land over a few years, he added.

He described cadmium as the most harmful trace element in sewage sludge. Cadmium is not needed for growth of plants and animals, including humans. In general, however, sewage sludge contains abundant amounts of organic matter and elements essential for plant growth such as nitrogen, phosphorus, zinc, and copper.

Corn grain in the experiments

did not accumulate large quantities of cadmium. Crops such as wheat and potatoes, however, built up cadmium more rapidly than corn grain to potentially harmful levels. Thus, with crops being rotated from field to field, Baker said routine testing of soil and sludge is vital.

Recent work at Penn State showed that treatment plant operators with land application permits, and haulers, were not keeping adequate records regarding spreading locations and rates of spreading. Baker said such records are important for an adequate monitoring program to protect land from excessive "loading" with metals.

"In Pennsylvania, sludge and soil testing services are available to allow safe and beneficial use of sludge on cropland," he remarked, and added that "a soil testing program has been developed to determine that soil loading has not reached excessive levels."

Such testing services can be made by commercial laboratories or the Soil and Environmental Chemistry Laboratory at Penn State. County agents with the Extension Service have forms to use in submitting sludge or soil samples for analysis.

Of the 50 sewage plants tested by Baker and associates, 19 had no heavy metal concentrations exceeding safe limits set by the Department of Environmental Resources. Application of sludge on farmlands from these sewage plants would be limited by the nitrogen content of the sludge, as with commercial fertilizer, Baker pointed out.

Ten sewage treatment plants had only one heavy metal exceeding harmful levels. The amount that could be applied to farmland would be based on three factors — the excess amount of that one heavy metal, the nitrogen content in the sludge, and the crop to be grown.

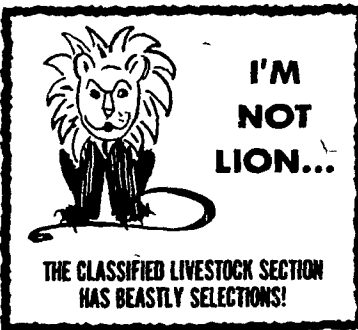


Receiving the dairy production awards for their family farm operations were: from left, Raymond Getz, Myerstown; Norman Kline, R2 Myerstown; Harold Bollinger, Newmanstown; James Bennetch, R2 Myerstown; and Malcolm Sonnen.

Myerstown; Harold Bollinger, Newmanstown; James Bennetch, R2 Myerstown; and Malcolm Sonnen.

## Elco Y.F.

(Continued from Page A27)



**Corn Yield**  
 1. Herman Sauter, 189.38 bu./acre; 2. Willow Maple Farms, 186.58; 3. Roy Miller, 186.52; 4. Paul and Donald Bollinger, 183.14; 5. Roy Weaver, 178.37.  
**Hay Quality**  
 1. Kline Springs Farm, 19.46 total

digestible protein; 2. Raymond Getz Family, 17.95; 3. John Moyer, 17.66; 4. Herman Sauter, 17.22; 5. Sonnen Acres, 16.55.

**Haylage**  
 1. Herman Sauter, 15.30 TDP; 2. Willow Maple Farms, 14.76; 3. Malcolm Sonnen, 11.37.



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