

## Acid rain study shows high concentrations

UNIVERSITY PARK — Acid content of rain, snow, sleet, and hail over Pennsylvania can be up to 42 times more acidic than "pure rain," according to James A. Lynch of the School of Forest Resources at Penn State.

Lynch and associates examined the acidity of rain and other forms of precipitation from a network of 12 statewide monitoring sites in 1982.

The most acid precipitation fell in the southwest portion of the state, including an area as far east as Centre County and north into Mercer County. In general, precipitation in the northeast quarter of Pennsylvania was less acidic than the rest of the state.

Acidity is expressed in pH units, Lynch explained. On a scale of zero to 14, any value below 7 is acid. "Pure rain" and other precipitation — uncontaminated by industries, autos, and power plants — has a pH of 5.6 to 5.7. Each drop of one pH unit, say from 6 to 5, represents a tenfold increase in acidity. A drop in pH from 6 to 4 means a hundredfold increase in acidity.

The annual average pH ranged from 3.98 in Armstrong County in the west, the most acid, to 4.17 in Pike County in the east. Cooperating on the project was Edward S. Corbett of the Northeastern Forest Experiment Station of the U.S. Forest Service, located at Penn State.

In general, the pH of

precipitation in 1982 was more acid during the growing season than during the rest of the year. This is usually the case, Lynch said. The average pH of rain during the growing season varied from 3.92 to 4.08. The dormant season pH ranged from 4.06 to 4.40.

"Throughout the Northeast, adding manmade pollution to acid precipitation produces an average pH of 4.1 to 4.2," he commented. "This occurs when sulfur and nitrogen oxides from the burning of fossil fuels — industries, autos, and power plants react with natural precipitation to form sulfuric and nitric acid."

The 12 monitoring sites covered all major storm tracks passing over the Commonwealth. In this way, storms were sampled shortly after coming over the state as well as along one or more other points while moving from west to east.

Sulfate was the dominant compound in precipitation. Sulfate concentrations were highest in the center of the Commonwealth and decreased both east and west, with the decline most evident in the east.

Of the total annual sulfate in precipitation, 69 percent fell during the growing season. During the summer, solar radiation and humidity combine to speed the process that turns sulfur dioxide in the air into sulfate. Air circulation is also slow in the summer, leaving sulfates in the atmosphere for long periods of time.

"High concentrations of sulfate did not always occur in the area of greatest sulfur dioxide emissions," Lynch stated. "This strengthens our belief that pollutants can be carried long distances through the atmosphere."

Nitrate pollution on the whole was fairly uniform, with slightly more present in the west than in

the east. Nitrate may be a significant fertilizer, it was observed, since most of it is deposited during the growing season.

Calcium, potassium, and magnesium were found at very low concentrations. They "buffer" or neutralize acids in the atmosphere and are considered essential plant

nutrients. Thus they are beneficial.

Measurable concentrations of chloride, ammonia, and sodium also occurred in precipitation during 1982. The highest concentrations of sodium and chloride were measured in the east due to the ocean's influence. Although slight, ammonia levels were highest in central Pennsylvania.

## Md. names tobacco authority head

ANNAPOLIS, Md. — Secretary of Agriculture Wayne A. Cawley, Jr., has announced the appointment of Stuart K. J. Carr, Jr., to the position of Executive Secretary, Maryland State Tobacco Authority.

Carr grew up on a tobacco farm in Southern Maryland and presently owns and operates his own tobacco and grain farm in Brandywine, Prince George's County. Between the time of his growing up and the establishment of himself in farming, however, Carr served for 20 years as a member of the United States Air Force. His primary Air Force duties related to explosive ordinance disposal which involved him as an active participant in the Viet Nam conflict. Upon his retirement in 1973 he returned to tobacco farming.

The major objective of the Executive Secretary is to ensure the orderly marketing of Maryland

Type 32 tobacco. In pursuit of this objective he is responsible for setting sales quotas for warehouses, investigates alleged infractions of Maryland's tobacco rules and regulations and approves buyer schedules for various tobacco warehouses. He is also responsible for administering licensing procedures for warehousemen and buyers.

During the market season which this year runs from March 13

through April 26, he collects and records daily and weekly sales records from eight tobacco warehouses to ensure that established marketing procedures are accurately adhered to and that all tobacco marketing regulations are followed.

"We welcome Mr. Carr to the Department" said Secretary Cawley, "and are confident that he is capable of doing an outstanding job as Executive Secretary".

## Warwick YF plans meeting

LITITZ — Agriculture runoff and the Chesapeake Bay is the topic of the next Warwick Young Farmers meeting on Monday at 7:30 p.m. in the Warwick High School Ag Room.

The featured speaker will be C. Victor Funk, Chief of the Watershed Branch of DER. Funk will be presenting the new state plan for

control of agricultural pollution, especially in the Conestoga watershed. Included in the state plan are best management practices of farms, community methane digestion systems, manure marketing programs and manure analysis.

All interested farmers are welcome.

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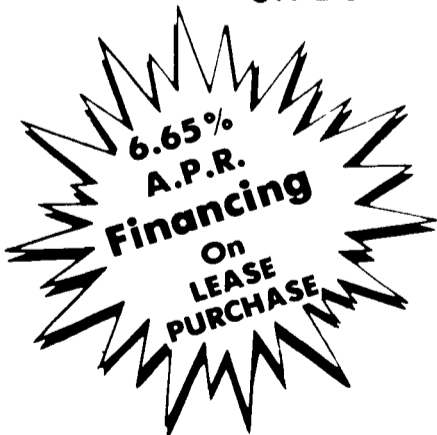
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