

# Invisible Enemy

## Rural Areas Vulnerable to Crop Damaging Ozone

WASHINGTON - Ozone and other air pollutants are costing farmers at least \$1 billion in agricultural crop losses each year, according to U.S. Department of Agriculture researchers.

"Farmers don't see ozone damage happening to their field crops, but it is," said Walter W. Heck, a plant physiologist who heads air pollution research at Raleigh, N.C., for USDA's Agricultural Research Service, in cooperation with the Environmental Protection Agency.

Damaging ozone is caused by a photochemical reaction of sunlight with automobile and industrial exhausts containing nitrogen oxides and hydrocarbons. It is different from the ozone layer in the earth's stratosphere that filters out ultraviolet sunlight but does not harm crops.

"Ozone is carried by prevailing winds, often for hundreds or thousands of miles," Heck said.

"That's why rural areas, despite having fewer automobiles and industrial plants, often equal the ozone pollution levels for urban areas."

As a result, he said, crops far away from pollution sources are not necessarily safe from ozone.

"We see in field test chambers and in greenhouses that ozone is causing leaves of soybean, wheat, cotton, peanut and other agricultural crops to die prematurely, reducing yields and costing the farmer money," he said. "And the \$1 billion figure doesn't include damage to horticultural crops and to forests."

Yield losses are based on crop studies done at sites across the country from 1980-82. Findings from 1983-85 are being compiled and analyzed, Heck said, and final results are expected in 1987.

Heck's laboratory has been studying the problem since 1980 as part of the National Crop Loss

Assessment Network, set up by EPA to get estimates of agricultural crop losses from ozone and other air pollutants.

A typical long-term concentration, or level, of surface ozone is .05 parts per million, Beck said. In test areas, ozone levels varied from about .04 to .06 parts per million during a seven-hour day, from 9 a.m. to 4 p.m. Over a growing season from April to September, he said, ozone levels fluctuated but averaged about .05 ppm.

That level can significantly damage crops when plants absorb it over an entire growing season, he said. Among the yield losses assessed to date in the NCLAN studies:

- Soybean yields also decreased 12 percent when exposed to .05 ppm of ozone in 1980-82 field tests at Argonne, Ill., Beltsville, Md., Ithaca, N.Y., and Raleigh.
- Winter wheat yields at

Argonne were reduced 7 percent.

- The lowest reduction at .05 ppm was 1.5 percent in corn tests at Argonne in 1981 and for sorghum there in 1982.

- As ozone increased, yields declined for all the crops tested. At .06 ppm, for example, soybean yields were cut by 17 percent, and at .09 ppm the loss was 21 percent.

Ozone enters a plant as its leaves absorb carbon dioxide necessary for photosynthesis, in which plants use sunlight to form carbohydrates. When damaged by ozone, a plant's leaves will age prematurely and discolor, leaf cells will die, and photosynthesis and growth will decrease.

## House Okays Rabies Control Bill

HARRISBURG - With a growing threat of rabies spreading through parts of central Pennsylvania, the State House of Representatives has passed a measure co-sponsored by Rep. Samuel Morris, D-Pottstown, to establish a statewide system for prevention and control of the disease.

The legislation, written with the aid of rabies researchers at Philadelphia's Wistar Institute, would combine the resources of the state Health and Agriculture Departments and the Pennsylvania Game Commission in efforts to curb the spread of the disease among domestic and wild mammals.

"The number of confirmed rabies cases went from 16 in 1979 to 450 last year, and appears to be more than doubling in 1986," Morris said. "This bill represents an all-out state effort to arrest the movement of rabies toward more populated areas and bring the disease back to normal, less threatening, levels."

Morris said the current outbreak of rabies originated in Maryland. It was initially confined to nine counties near the Maryland border, he said, but has spread to 30 or more counties this year.

Under the bill approved by the House, the Department of Health, in cooperation with other state agencies, would monitor cases of rabies in domestic and wild animals and declare designated risk areas of the state.

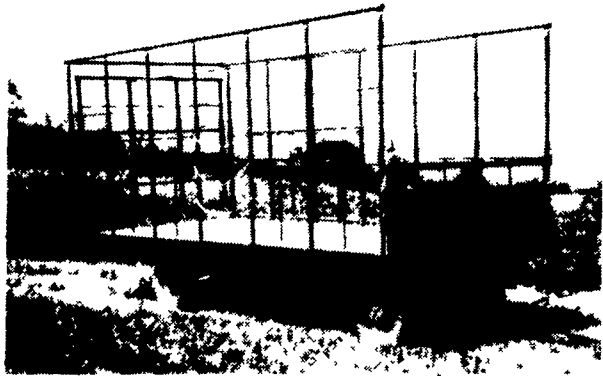
Within those areas, all dogs and cats over three months of age would be required by law to receive rabies vaccinations either through private veterinarians or through low-cost rabies clinics to be set up in affected counties.

Individuals, such as farmers and kennel owners, who had administered their own rabies shots to pets and livestock prior to passage of the bill would be allowed to continue doing so as long as they kept accurate records.

The bill (H.B. 2164), approved by a vote of 193 to 0, also includes strict reporting requirements covering animals which have bitten or otherwise exposed humans to possible rabies infection. These cases, and those involving animals suspected of having rabies, would have to be reported immediately to local county health agencies.

State and local agencies would also be involved in monitoring rabies cases and conducting public education campaigns on the disease in risk areas.

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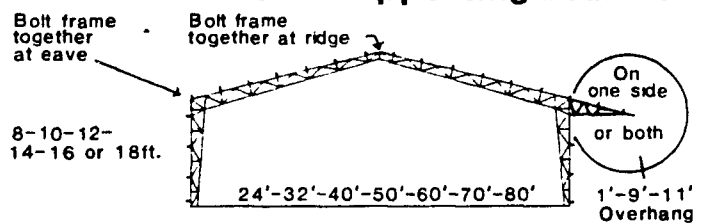
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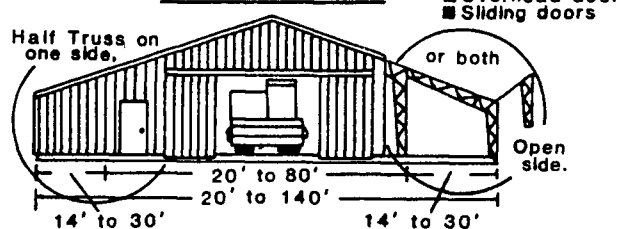
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