

High voltage fields said harmless to animals

UNIVERSITY PARK — High voltage electric lines are not hazardous to animals living near them, research at Penn State shows. Tests were made along small animals, following complaints that high voltage electric fields could create health hazards.

The experiments have exposed thousands of animals, as well as plants, to electric fields many times greater than those under existing power lines. No adverse effects have been found.

The maximum intensity of electric fields under power lines in Pennsylvania is 10 to 13 kilovolts per meter. Thunderstorms, it was noted, can create 3 or more kilovolts per meter.

Tests exposed mice, rats, chickens, and pigeons to as high as 100 kilowatts per meter, reported Hannon B. Graves, professor of poultry science at Penn State.

Studies of chicks indicated that exposure for 30 minutes to electric fields of 40 to 80 kilovolts per meter had no significant effects on males or females. Longer exposures at the same intensity demonstrated a significant but not permanent increase in early growth of male broiler chicks.

Almost any such stimulation can produce a similar early growth rate among baby chicks, Graves stated.

Newly hatched chicks were exposed to fields of 40 and 80 kilovolts per meter. No real difference in heart rate and brain wave signals were observed. These two tests are used extensively as indicators of animal well being.

In other studies, Graves and associates exposed mice to electric fields of 25 and 50 kilovolts per meter for six weeks. Then extensive blood

chemistry tests were taken. There were no significant differences between exposed and unexposed groups in red blood cell count, total blood cell volume, and hemoglobin concentration.

Mice were also tested for response to stress, as measured with corticosterone, a major hormone in the mouse. Corticosterone in mice is known to increase in response to noise, light, crowding, and drugs. The tests showed immediate and very short-term elevations in serum corticosterone to electric fields exceeding 25 kilovolts per meter.

"This was probably due to an orientation reaction, indicating sensory stimulation rather than stress," Graves stated. "Exposure of mice to electric fields for periods up to several weeks did not raise levels of this hormone. However, stress from exposure to loud noises showed very high and prolonged increases in blood corticosterone," he added.

Graves is often asked the question, "Do animals perceive electric fields and, if so, how?"

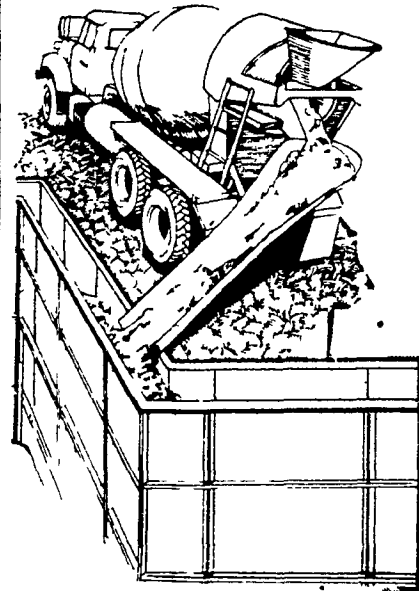
To study this aspect, domestic pigeons were taught to peck at keys at a very high rate, 11,000 to

15,000 pecks per hour, to get food. The pigeons were then conditioned to stop pecking if they could detect electric fields.

The pigeons could detect electric power transmitted at 60 cycles per second, the typical rate for high voltage lines. The intensity of the electricity was about 37 kilovolts per meter. The Penn Staters believe detection of the electric field is created through feather vibrations caused by exposure to alternating current.

Similar studies are being continued at Penn State. Incubating eggs are being exposed to fields of 20, 40, 60, 80, and 100 kilovolts per meter for periods of 7, 14, and 21 days. (Eggs of domestic chicks require 21 days to hatch). These experiments are in progress.

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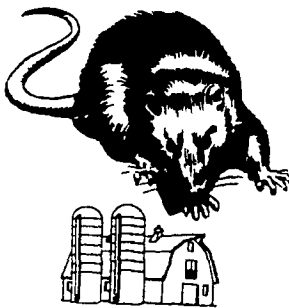
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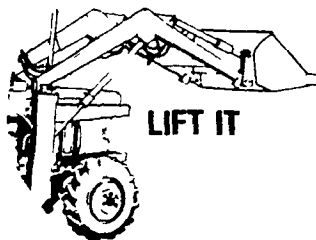
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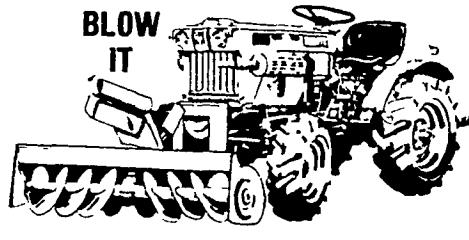
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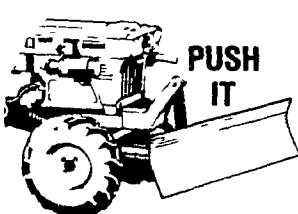


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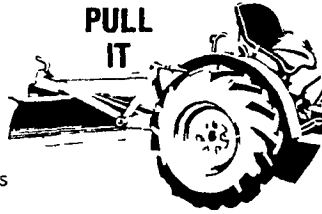


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