

## SCIENCE & TECHNOLOGY

power? What would be the effect of several thousand windmills on the capital outlays of a utility company—an expense which helps determine the company's rate base and hence its rate of return on investment? Should a federation of windmill owners be allowed to bargain collectively with a local utility on rate matters, outside the jurisdiction of government regulators? Can the utility be compelled to transmit power that the windmill owners wish to sell to third parties?

"Wind power is one of the most readily adaptable alternative technologies," Lodge argues. Before it can prosper, however, state and federal regulatory systems may have to be changed to reflect a new and different view of energy production and its control.

### *Fooling With Mother Nature*

"Plant Growth Regulators" by Louis G. Nickell, in *Chemical and Engineering News* (Oct. 9, 1978), 1155 16th St. N.W., Washington, D.C. 20036.

The use of herbicides to increase crop yields by controlling weed growth has had a major impact on modern agriculture. Now, another family of agrochemicals—the so-called plant growth regulators—promises even more startling results.

Plant growth regulators, writes Nickell, vice president of research and development for Velsicol Chemical Co., are organic compounds (either natural or synthetic) which alter the life processes or structure of a plant so as to increase yields, improve quality, or ease harvesting. The first significant commercial use of a plant growth regulator came during the 1940s when naphthalene acetic acid was applied, as it still is, to prevent the preharvest drop of apples.

Today, plant regulators are used to promote rooting, speed up or delay flowering, induce or prevent leaf and/or fruit drop, control plant size, prevent postharvest spoilage, change the timing of crop maturity, and increase resistance to pests, air pollution, and extreme temperatures. A shortage of fruit pickers, for example, has led U.S. chemical companies and the Florida State Citrus Commission to develop compounds that loosen citrus fruit to speed harvesting.

How these plant-regulating chemicals work is still not thoroughly understood, but some are known to alter cell development and to synthesize enzymes. Results are sometimes spectacular. As little as 2 ounces per acre of the hormone gibberellin (which makes stalks grow longer) increases the yield of sugar cane by more than 5 tons per acre and the output of sugar by 0.2 to 0.5 tons per acre. About half the wheat grown in West Germany is treated with Cycocel, a product made by American Cyanamid that reduces stem length and gives the plants greater resistance to heavy winds and rain. A few grams per acre of another compound known as *dinoseb* boosts corn yields 5 to 10 percent.

The real value of growth regulators, says Nickell, may not be their ability to help increase gross crop volume so much as their ability to control the internal metabolism of a plant to produce more sugar, protein, or oil, and to prevent losses caused by failure to reach maturity.