

How outside forces affect agriculture

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improving land productivity more than two percent a year, at a time when even less productive land was being brought into production to cope with a perceived shortage in grain worldwide.

The new field of biotechnology, he noted, really isn't all that new. Man has been using biological techniques for at least 10,000 years, selecting crops for more desirable traits, fermenting grapes to produce wines, using yeast in making bread, and, more recently, developing antibiotics with microorganisms.

Strictly speaking, the practice of biotechnology can be said to include the use of living organisms to make or modify products, improve plants or animals or to develop microorganisms for specific uses.

Current efforts in biotechnology take one of two forms:

- Use of cell and tissue cultures to speed up the process of finding and isolating desirable traits or characteristics, like resistance to disease, temperature variation or toxic substances.

- Use of recombinant DNA technology, the scientific term for the kind of genetic engineering that allows scientists to artificially create new organisms by altering gene structure.

Less dramatic, perhaps, but equally important, Hess added, is the application of biotechnology in the animal sciences, specifically with embryo transfer.

An estimated 100,000 cattle were produced in 1984 through use of embryo transfer, he said, a practice which "provides exciting possibilities for research in livestock."

Perhaps the most immediate application of biotechnology, Hess added, is the development of bovine growth hormone, a naturally occurring hormone that could increase milk production by as much as 25 percent per animal.

If the hormone is adopted for widespread use, as predicted, after its introduction in about 1988, the impact on the dairy industry will be significant, he said.

"By the year 2000, primarily with the use of BGH, the U.S. would have 30 percent, or 3.3 million fewer dairy cows, 51 percent or 92,500 fewer dairy farms, 195,000 fewer dairy farm employees and nine to 10 million fewer acres would be needed for dairy feed production," Hess noted.

To cope with the new technology, Hess said, the dairy industry must find a way to expand a market always considered to be inelastic. He cited a survey by Lew Mix, suggesting that the rate of adoption can be modified, but the ultimate results cannot be.

And he cited Mix's recommendations that the industry expand its markets by using consumer-oriented products, better packaging, consumer education and adequate advertising.

One last part element of emerging technology that will affect agriculture, Hess noted, is the use of computer and information technology.

New applications of this information capability, he said, include electronic animal identification, reproduction management such as estrus detection and fertility monitoring

and disease control.

Nor are these the only applications of truly "high-tech" engineering. Scientists are working now on robotic and artificial intelligence applications for agriculture, he said. And other uses are sure to come.

Despite the depressed state of agriculture, the development of new technologies makes the Eighties an exciting time, full of danger as well as potential, he said:

"On the one hand, the agricultural economy is at its lowest point since the depression — and agricultural technology has

contributed to environmental problems and concerns for the health of humans and wildlife.

"On the other hand, there are emerging technologies which can help increase the efficiency of production and help recover our competitive advantage and at the same time reduce environmental and health risks.

"If the emerging technologies are used wisely, the goal of an economically viable and a sustainable agriculture can be achieved here in Pennsylvania and throughout the U.S."

Helping to shape that agricultural future in the state and

Northeast is the responsibility of Project Toward 2005, a program directed by Dr. Mark R. Bailey, who followed Hess to the podium.

Dr. Bailey's group is attempting to outline the demographic profile of the Northeast's population in the coming years, so that agricultural experts can determine the changes in demand for food products.

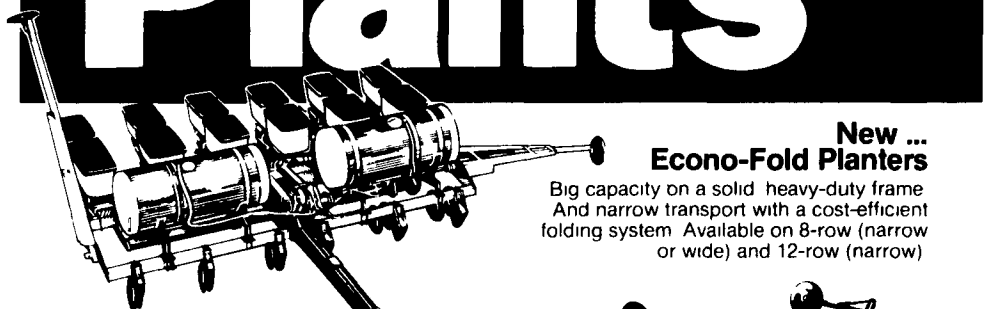
As a region, the Northeast has a number of strengths as an agricultural producer, including large population, readily available markets, adequate water supplies, experienced farmers, diversity of products, adequate credit

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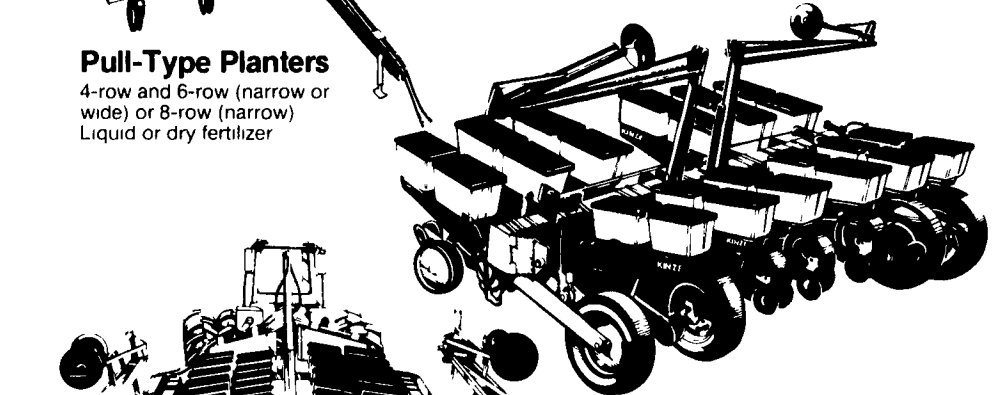
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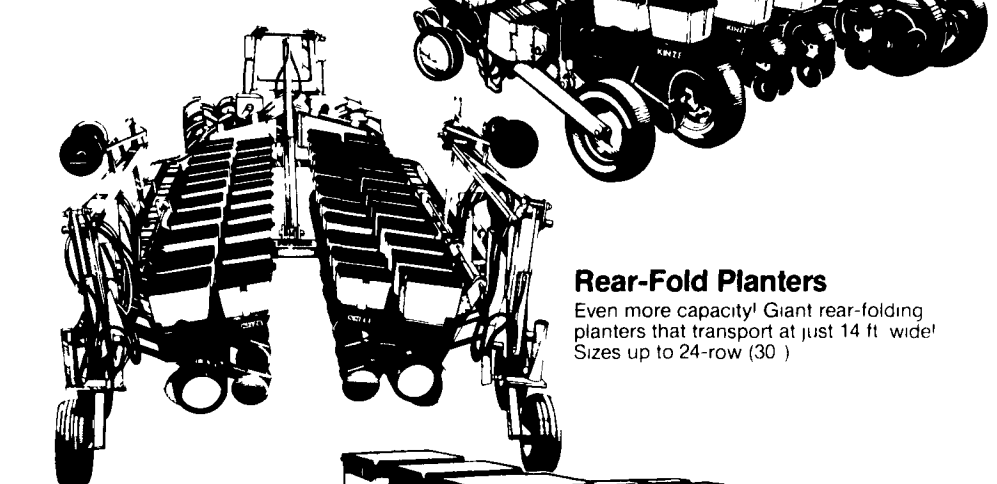
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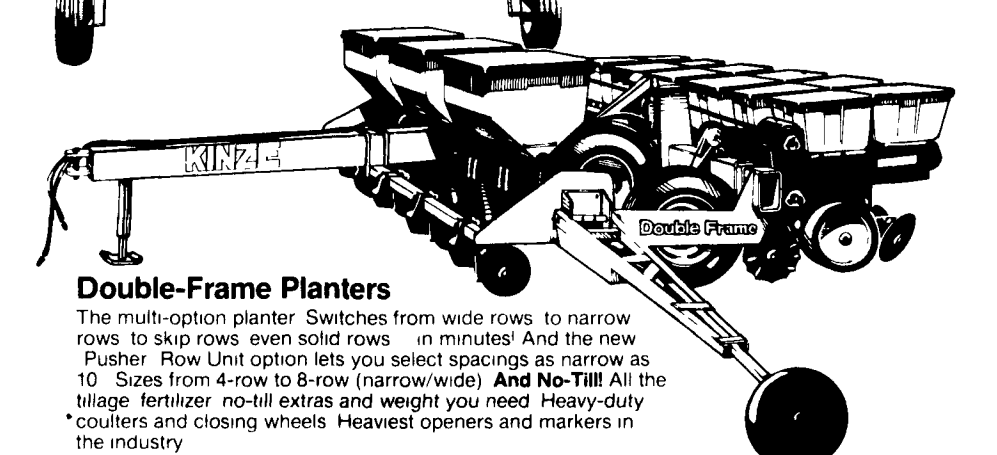
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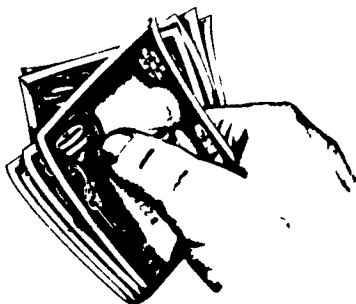
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