

MISSISSIPPI, 1984 YEARS AWAY

KALAMAZOO, Mich. — Recent revolutionary breakthroughs in genetic engineering technology hold promise for the development of "new-generation" vaccines that may control a variety of tough diseases in poultry and animals.

But major, significant developments to agriculture, using these new techniques, could be years away.

This assessment comes from J.R. Welser, vice president and director, agricultural research, for The Upjohn Company. Welser made his comments in a recent speech to the Mississippi Poultry Association.

Welser said that new technological discoveries now make it potentially possible to "design" specific proteins in the laboratory for development into vaccines.

Called "sub-unit" vaccines, Welser said they hold promise for potential control of many tough diseases, such as Marek's in poultry, foot and mouth in cattle, pseudorabies in swine, and possibly even Herpes in humans.

In developing sub-unit vaccines, Welser said researchers rearrange selective pieces of the problem virus in the laboratory.

"By taking only a piece of the virus, and skillfully rearranging its molecules, genetic engineers can develop a vaccine that fools the animal's body into thinking that the entire live virus has been injected into its system," Welser explained.

"This will cause the animal to produce antibodies to the virus," he added. "Yet, since the vaccine does not contain actual real viruses, the animal will not be given the disease or become a carrier as a result of the vaccination."

He said this type of genetic engineering technology could also lead to other remarkable new developments in agriculture, including growth hormones, specially designed bacteria to assist ruminants in the digestive breakdown of cellular feedstuffs, improved diagnostic technology, and monoclonal plant breeding systems, among others.

At the Asgrow Seed Company, for example...an Upjohn subsidiary...Welser said research was already using somatic cell hybridization, pollen culture, meristem culture and other tissue culture techniques in the development of disease resistance in certain agronomic and vegetable crops.

And Upjohn ag researchers have joined forces with the company's human medicine researchers to begin research studies in a wide variety of genetic engineering areas, he said.

While Welser agreed that this new technology holds great

promise for revolutionary changes in both animal and human science, he cautions that most of these discoveries will be a long time in coming.

"Many current stories about this technology make it seem as if the revolution in high technology is already upon us, and that we'll soon solve all the world's agricultural and food problems," he stated.

"Basically, this just isn't true," he added. "We have just barely scratched the surface in these new high technology research areas. And the payoff and benefits are years, even decades, down the road."

"Scientific discoveries in agriculture that are truly of the breakthrough type, take many years to fully develop," he added.

He pointed out that area of genetic research that involve more than one genetic characteristic are the most difficult of all to develop.

"For example," Welser said, "one of the most popularly discussed items in genetic engineering has been speculation that we can develop a corn plant that will fix its own nitrogen."

"Also, there's been speculation that soybean yields can be doubled or tripled with genetic engineering techniques."

He pointed out that: "In theory, all of these things are potentially possible. But, such things as rate of gain, crop yields, crossing of different types of plant species, and so on, are all multi-genetic challenges."

"This kind of genetic engineering is at least 10 years on the horizon, and possibly as many as 50 years."

However, Welser said that he believes agriculture is currently entering its "most exciting era imaginable," and that the next 50 years will see "phenomenal" change and new development.

But, he cautioned that while these new breakthroughs will solve some of agriculture's problems, technology will, in some cases, create new sets of problems that will, in turn, need to be solved.

He explained that recent new technological developments have allowed U.S. crop and livestock productivity to skyrocket.

But he said this dramatic increase in productivity has permitted us to ignore serious problems in agriculture, including depletion of water supplies and dramatically increasing soil erosion problems.

"New technology is extremely valuable, even critical, to the poultry industry and agriculture," he concluded. But, it must always be put into its proper perspective.

"New technology is not a crutch which we can always rely on to solve our every problem."

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