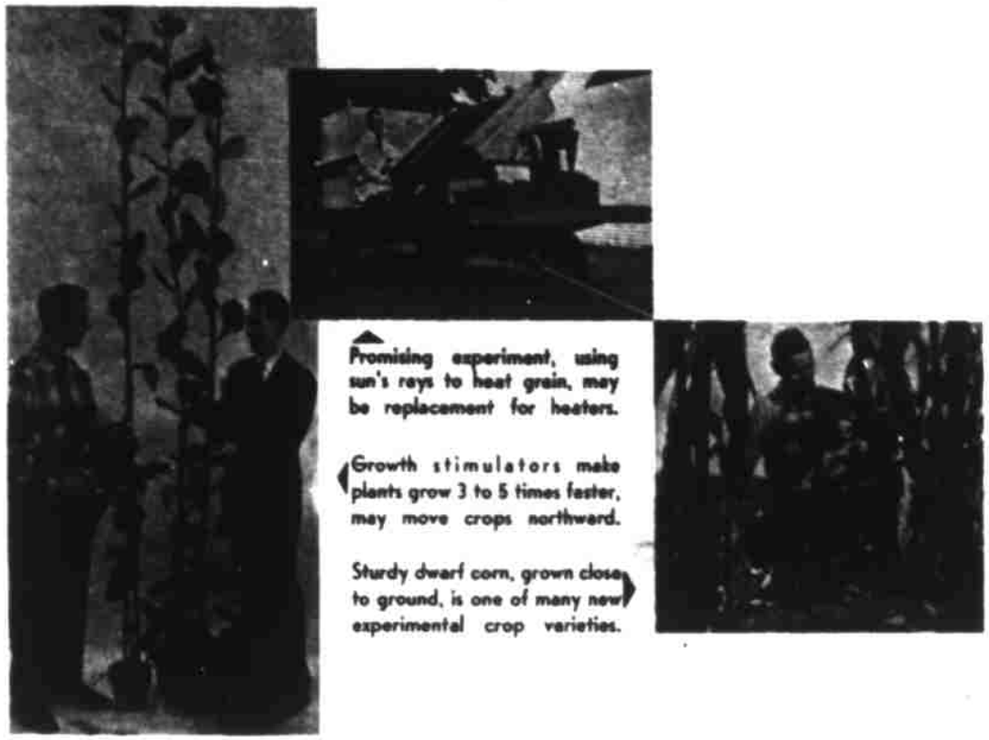

Promising experiment, using sun's rays to heat grain, may be replacement for heaters.

Growth stimulators make plants grow 3 to 5 times faster, may move crops northward.

Sturdy dwarf corn, grown close to ground, is one of many new experimental crop varieties.

vested $13 billion. Until we can reduce such losses, scientific crop control might as well be done by flipping a coin.

The farmer thinks part of the solution is in crops and stock with built-in resistance to natural hazards. A few toughened plants and animals already exist. New tobaccos, for example, fight off five of the worst crop diseases, and certain wheat varieties now resist stem rust.

Hardier breeds can even foil the predatory insect; that villain of the Midwest, the corn borer, is expected to be conquered within 10 years by inbred resistance.

Some farms already are using disease-hardened strains of poultry; the next step, experimenters believe, is to develop livestock impervious to common ailments.

When tomorrow's farmer plants his new crops he will be fighting still another scourge of agriculture—drought. The improved plants will require less moisture and will make better use of it in critical stages of growth. To provide moisture, the farmer will reclaim brackish water with an electric ion-changing device which removes salty impurities. Or, after a rain, he may take a spray gun and cover his fields with an organic chemical which seals in moisture. His pond already will be lined with plastic to control drainage and reduce polluting growth.

SAVING CROPS will be just a part of our future farmer's job. He also will have to produce more per acre and spend less time doing it. That means he'll need a lot of help from that handyman, modern science.

By 1977, for example, research will have developed crops with greater concentrated yields. The farmer will average 100 bushels per acre of newly bred corn (last year's yield was 45 bushels) and will look forward to hybrids that bring as much as 200 bushels.

Improved machinery will save valuable time in producing these intensified crops. One unit will plant, fertilize, and spray insect killer in a single trip over the field—then be adjusted to handle other farm jobs. Future crops will be bred especially for the machine age. Today's corn, for example, was bred with ears at uniform height to facilitate harvesting; other crops also are being "tailor-made" to fit the specifications of all-purpose machines.

The dairy farmer will save time by shipping milk through a pipeline direct from barn to supply depot. And rather than inject cattle individually with vaccines, the farmer will spray live virus into an enclosed area and immunize his entire stock against a variety of diseases.

Pigs will not be raised—they will be mass-produced in hatcheries as poultry is today. To get into initial production, the farmer will order "piglets" by the crate, eliminating those long, late hours attending unpredictable births. He will place pigs in concrete lots because land is too valuable for pasture. The hatchery will be air conditioned, to assure top weight gains in hot weather, and completely sanitized to reduce the risk of disease.

Automation will be as much a part of tomorrow's farm as of tomorrow's factory. Automatic timing devices, for instance, will feed and water livestock and control the flow of irrigation. Along with other new techniques and machines, automation will drastically reduce chores which now take one-third of the farmer's day, allowing more time for management, sowing, and reaping.

MOST OF the changes on our farms will be startling only to the city dweller. The farmer knows that the "agricultural revolution" has been going on for decades and that the important change of the future will be the widespread application of techniques already familiar to laboratories and experimental farms.

One aspect of current research could bring radical developments, however. Atomic energy has been suggested for everything from tracing secret growth processes to powering gigantic irrigation projects. But the atom's real value must still be determined, and several experts have pointed out that we must solve the current surplus problem before further accelerating agriculture with nuclear energy.

They would prefer that researchers devote themselves less to atomic farming and more to discovering new uses for products we already grow but cannot consume. Can new textiles or plastics be derived from our surpluses? What industrial and commercial developments will help farm markets keep pace with farm production?

No amount of research, of course, can assure the American farmer a trouble-free tomorrow. Yet increasing knowledge and broadening experiments will help him meet the future successfully—and profitably—in making his indispensable contribution to America's well-being.