

New Techniques in Farming

Agronomists in the United States have a goal which if achieved, could increase the world's food supply by at least 50 per cent.

Their goal : To assure that every seed planted gets an optimum environment with a minimum of Stress so that an entire crop may attain simultaneous uniformity of size, spacing quality and harvest maturity.

It is a goal that agronomists are confident will be reached before long. Their optimum is based on progress already made in obtaining 90 per cent or higher emergence of some seed varieties.

"The world could produce 50 per cent more food if every seed of every crop planted on all continents would produce its full potential at harvest maturity," one agronomist said.

Scientists are joining hands with agricultural engineers in efforts to develop techniques that will :

1. Stimulate seeds to germinate at temperatures significantly lower or higher than normal.

2. Place and space each seed precisely for maximum use of sunlight and moisture.

3. Envelop each seed in a kind of "miniature nursery" within which the seed is protected against disease, insects, rot, weeds, overcrowding and soil crusting.

By capitalising on these advantages growers could benefit from faster, low-cost mechanical harvesting, especially on crops traditionally reliant on manual labour.

"Miniature nursery"

Seed coverings—someone has likened them to "miniature nurseries"—seem to be the answer agronomists are seeking.

Some experiments involve coating each seed with a ball-like compound, giving it a uniformity in shape and size to permit use of precision planters in the field. In each ball, along with the seed, would be elements to fertilise it and protect it chemically against insects and disease.

Numerous materials have been used to modify the seedbed. Plastic film and petroleum mulches have been employed to raise soil temperature and hasten germination of early planted crops.

Anti-crusting materials have been tested extensively as substitutes for soil to cover lettuce seeds. All of those materials generally promote the emergence of seedlings by reducing or eliminating crusting over the seed.

The use of preformed vermiculite cones and discs to encase lettuce seeds have been reported by A. W. Pauli, agronomist, and B.L. Harriott, agricultural engineer, both of Deere & Company, of Moline, Illinois.

With this technique, they said, lettuce seeds were encased in a geometrically-shaped matrix of compressed vermiculite and polyvinyl acetate. The shaped cone or disc with the imbedded seed is passed into the seedbed, leaving the top exposed.

Before seed is used, it is treated with a nutrient solution to stimulate germination.

Though this vermiculite "mini-nursery" technique has been successful for commercial lettuce growing research indicates similar results are possible with seeds of corn, cotton sugar beets and grain sorghum.

"Seeds on a spindle"

"Seeds on a spindle" is another method beginning to achieve popularity with commercial growers of vegetables in the United States, and in some other countries. It is precision planting at its best, according to those experienced with this new planting technique.

John G. Knoop, writing in the U. S. *Farm Quarterly* magazine, supplied a terse description of the technique :

"The tape runs out in bright ribbons of polyester from reels on a planting sled. The tape unrolls under the soil at the prescribed depth, each seed spaced with the precision of a computer programme and each seed oriented horizontal to

the soil surface. When the planter reaches the end of the field the tape has dissolved (as a result of water sprinkling) without leaving a trace. The seed is locked in place, ready to germinate.

A few years ago Union Carbide Company, a world-famous producer of chemicals and plastics, discovered a polyethylene oxide (trademarked Radel) which is very stable under normal temperatures but really dissolve in 60 to 90 seconds when put in the soil with adequate moisture for germination. Union Carbide calls its product EVENSEED tape.

The commercial producer of the seed tapes uses automatic machines which place the seeds, especially tested for high germination and emergence, properly spaced apart on the quarter-inch wide tape. Then the tape is sealed with an overlapping strip of tape and wound on spools.

The spools are used on planters, simply constructed units which can be bolted to any squire toolbar. The tape feeds through a tube to the furrow, laying the tape to the proper depth under the soil.

Synthetic soil blocks

Developed especially for the propagator and secondary grower are HR-8 synthetic soil blocks, described as a new and superior medium for rooting and shipping, planting cuttings or seedling.

HR-8 soil blocks, sterile, non-toxic to plant growth are made from carefully selected softwood kraft wood pulp and stabilised with acrylonitrile resin. The patented manufacturing process makes the woodpulp resistant to decay. The block is highly retentive of water capable of holding about 10 times its weight in water.

The blocks come with seed holes of three different sizes : small, medium and large. By selecting blocks with the proper size hole, the grower allows the seeds to make good contact with the block and encourages plant growth.