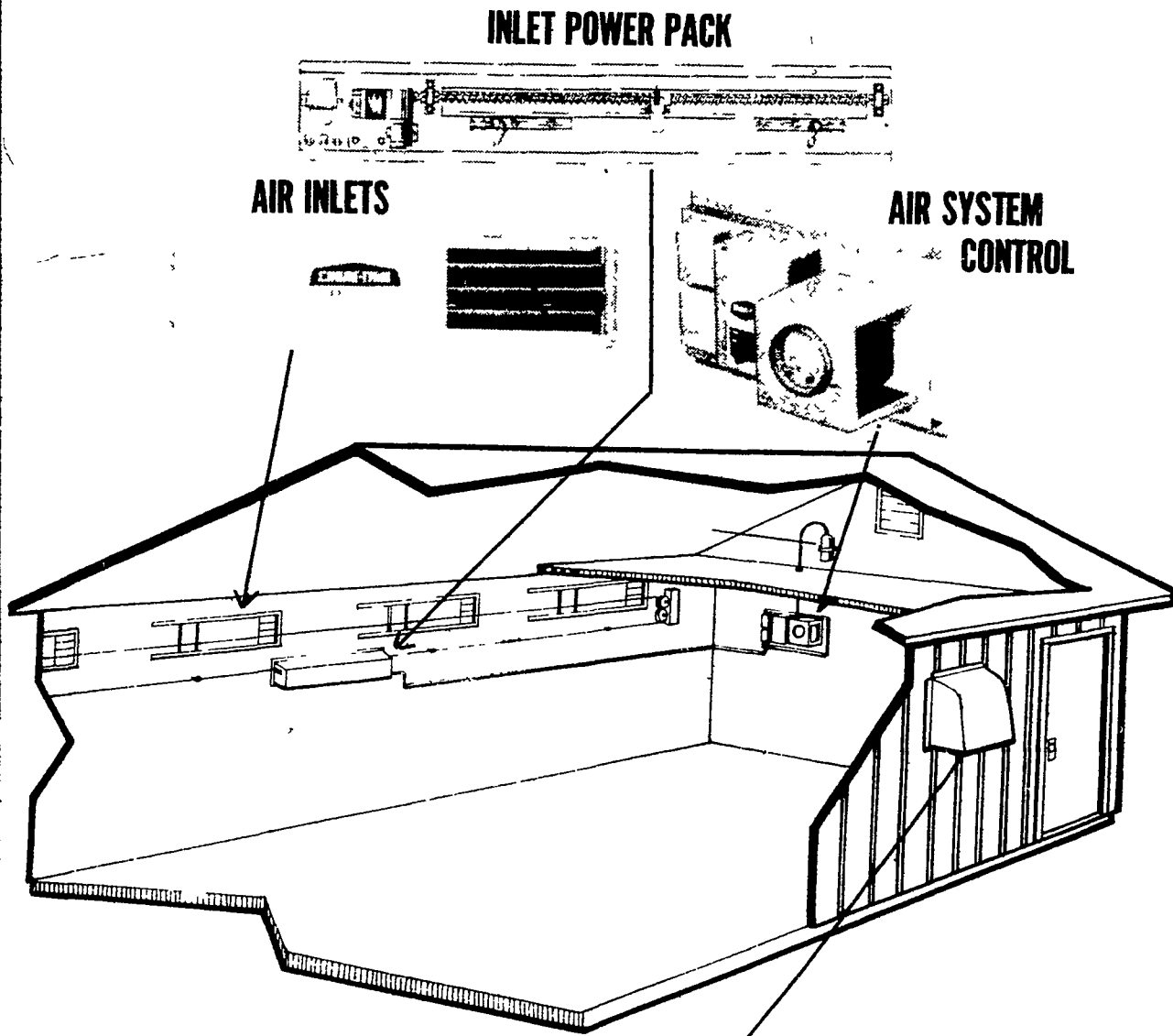


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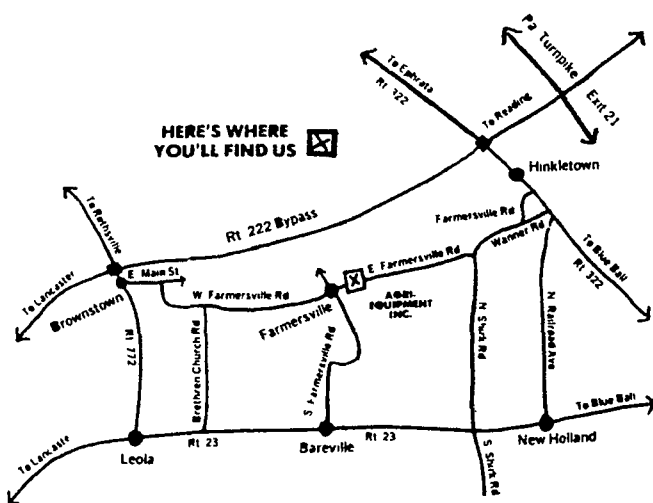


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Plowing reduces veg rot diseases

BELTSVILLE, Md. — Some vegetable growers could benefit from putting away the fungicides and getting out the plow, say two USDA scientists.

This advice came after a three-year study in which plant pathologists, George Papavizas and Jack Lewis tested several nonchemical methods to control the pesky fungus, *Rhizoctonia*. The fungus is responsible for at least \$5 million in annual losses to U.S. cucumber growers, and it also an important pathogen of beans, radishes, sugarbeets, tomatoes, and other crops.

The tests which compared plowing with disking, the scientists cut cucumber fruit rot in half; in other tests, they doubled the stand of snapbean plants. In both tests they simply turned the soil to a depth of 8 to 10 inches (20 to 25 cm) before planting.

Deep plowing was as effective as two fungicides (Difolatan and Bravo) used in plots which were disked to a depth of two or three inches rather than plowed. Switching to the plow might reduce disease on other rot-susceptible vegetables such as tomatoes, say the scientists.

Rhizoctonia solani survives on crop residues which are disked into the surface layer of the soil, explained Papavizas. Disking—the general farm practice—actually provides nutrients for the fungus. But deep plowing buries the crop residues and fungus into an unfriendly environment and because of low oxygen and high carbon dioxide, the fungus pathogen is virtually "smothered," he said.

Disease control was boosted another 20 to 25 percent in the plowed experimental plots when the researchers used two species of soil-inhabiting fungi that attack the *Rhizoctonia* fungus.

Even in the disked plots the two organisms, when incorporated into the *Rhizoctonia*-infested soil, gave as much control as fungicides applied at two to three times the recommended dosage, said Lewis.

Both of the effective organisms, *Corticium* and a strain of *Trichoderma*, were laboratory-grown, and preparations are not available commercially. They were applied into the seed furrow in the bean plots because *Rhizoctonia* attacks the tender seedlings causing root rot and damping-off. In the cucumber plots, the fungi were lightly raked into the soil between the rows two to three weeks after planting. Cucumbers get fruit rot by direct contact with infested soil.

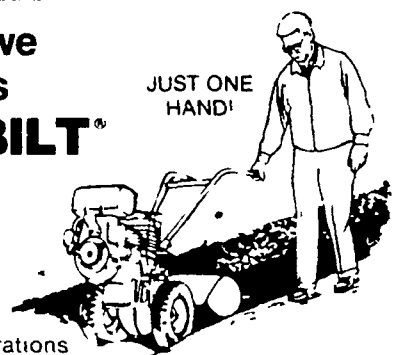
Experiments were carried out in silty-clay loam at the Agricultural Research Center in Beltsville, Md., and loamy sand on Maryland's Eastern Shore.

Fruit rot (also called soil rot and belly rot) is one of the most serious diseases of cucumbers in the southeastern United States. Warm, humid conditions in the south coupled with high-density planting make an ideal "growth chamber" for *Rhizoctonia*. Further, the practice of planting the same crop year after year enhances the fungus' survival, thereby cutting down on the effectiveness of fungicides, says Lewis.

Similar conditions contribute to severe disease in snapbeans on Maryland's Eastern Shore. Farmers there may harvest two bean crops a year. The first crop grown in the cooler weather is relatively disease-free because *Rhizoctonia* hasn't recovered from the winter kill. But when the first crop's residues are disked into the soil and the temperature and humidity rise, the fungus grows rapidly and "clobbers the second planting," Papavizas said.

Unfortunately, plowing may increase erosion while burying organic matter deep in the root zone, Lewis noted. However, it never failed to reduce diseases and increase plant stand in three years of experimentation, he said. "Even on sandy soil we got three times more yield in the plowed area than in the disked areas," he added.

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