

USDA Develops Plants With Built-In Insect Repellent

WASHINGTON — The U.S. Department of Agriculture has developed the first hybrid potato plants with their own insect repellent built into their leaves.

As a result of two years of biotechnology research, a team of scientists with USDA's Agricultural Research Service fused together single cells from wild and commercial potato plants, then regrew the hybrid plants from the fused cells.

These hybrid potatoes contain a rare gene for leptine, a chemical that repels insects, team leader Stephen L. Sinden said today.

"The most devastating pest of U.S. potato fields, the Colorado potato beetle, is repelled by leptine," Sinden said. "The beetles land on the hybrid plants as usual. They peel back a little skin on leaves and nibble, but then fly away. The plants are barely touched."

In recent years, the beetles have developed tolerance to insecticides that farmers continue to spray at an annual cost of over \$120 million. In further tests this summer, it is likely that the hybrid plants will

resist some other pests, such as troublesome potato leafhoppers, he said.

Cell fusion is a method of genetic engineering that is different from gene splicing or recombinant DNA. In cell fusion, genes that make up DNA, the hereditary molecules, remain intact, he said. "The advantage of cell fusion is that we know the fusion hybrids not only have the desired genes but also that the genes are likely to be expressed in the plants."

With the potato hybrids, Sinden said, "this advantage could help breeders develop insect resistant varieties within several years."

The hybrid plants produce much larger potatoes than do the wild potato plants — at least half the size of commercial potatoes, Sinden said. "We're also pleased that the fusion hybrids are fertile, that they can be cross bred to improve tuber (potato) yield and quality."

Leptine may be toxic to humans in large doses. However, Sinden said, the hybrid plants make leptine only in the leaves, not in the potatoes. The gene for leptine is found in only one of a thousand

types of wild potato plants. To find the gene, his team screened 800 wild plants from one of the world's premier collections of research potatoes, the agency's Inter-Regional Potato Introduction Station in Sturgeon Bay, Wis.

Sinden's team found that leaves of a few plants of a wild species called *Solanum chacoense* have high levels of leptine. Researchers used enzymes to dissolve bits of the leaves into millions of single cells in a laboratory dish. Another treatment removed the cell walls, natural barriers to plant cell fusion. The scientists repeated the process to produce a second dish of wall-less cells from a variety called Saco. They poured both dishes of naked cells into a beaker of chemicals that forced close contact and fusion of cells.

Only about one percent of the cells fused, mixing their genes, said Sinden, but in all the hybrid plants the leptine gene from *S. chacoense* became part of the DNA from Saco.

The agency team includes plant pathologist Kenneth L. Deahl, geneticist Lind L. Sanford, ento-

mologist William W. Cantelo, and Sinden, a plant physiologist, all at the Beltsville Agricultural Research Center near Washington, D.C., and chemist Stanley Osman at the Eastern Research Center in Philadelphia, Pa.

Agency plant breeder Raymon

E. Webb at Beltsville is using the new hybrid plants to breed insect resistant potato varieties for the eastern United States. Charles R. Brown, plant breeder at Prosser, Wash., is doing the same for western potato growing regions.

Immigration Reform Employers Handbook

Under the federal Immigration Reform and Control Act of 1986, all employers must verify the employment eligibility of all workers hired after November 6, 1986, by completing and retaining the one-page I-9 form.

The Immigration and Naturalization Service has prepared a "Handbook for Employers: Instruction for Completing Form I-9 (Employment Eligibility Verification Form)." Over the past month, the Internal Revenue Service has been distributing the handbook to employers.

The INS has asked the Cooperative Extension Service to assist in distributing the handbooks to new

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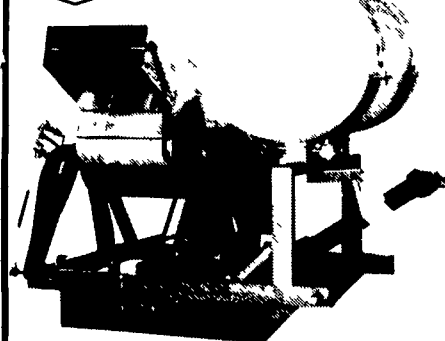
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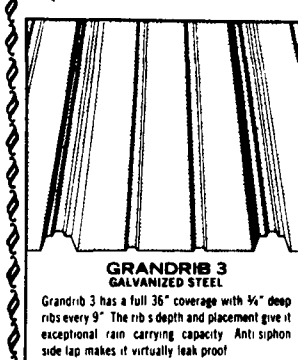
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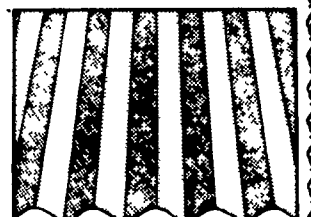
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