REGULATION

DEBATE OVER PLANT PATENTS GROWS IN EUROPE

AMSTERDAM—The International Coalition for Development Action (ICDA), based here, has found uncharacteristically common cause with the International Union for the Protection of New Varieties of Plants (UPOV). They both oppose a demand from European companies that plants created by recombinant DNA techniques—as well as the techniques themselves—should be patentable.

The conflict arises for two reasons. First, plant breeders in Europe have virtually never been allowed to patent their products. Instead, their rights are enshrined in the convention which established the UPOV in 1961. Supported by 17 European countries, the convention is now administered through the World Intellectual Property Organisation in Geneva. It gives breeders ownership of new varieties they create, regardless of who owns the parent stock. A 1973 European Patent Convention codified the position further, stating that patents would not be permitted for plants, animal varieties, or "essentially biological *processes* for the production of animals or plants."

Second, and despite the existence of these measures, the West German Patent Office is now considering an application covering the process developed by Josef Schell and his colleagues at the Max Planck Institute for Plant Breeding Research (Cologne) for the transfer of genes using the Ti plasmid of *Agrobacterium tumefaciens*. Bayer AG (Dormagen, F.R.G.), the chemical company which already holds provisional rights to Schell's process and which contributes over $300,000 each year to his Institute, has a substantial interest in the outcome. The company argues that without patent protection, such investment would be pointless.

Already opposed to plant breeders' rights enshrined in the UPOV convention, the ICDA argues that patents would make matters much worse for the Third World by giving multinational seed companies monopoly control over crop plants. This, indeed, was one of the reasons why Europe did not follow the U.S. earlier this century in authorizing the patenting of plant varieties.

The whole question is about to be given extra impetus by an Organisation for Economic Cooperation and Development (OECD) report, due for release shortly, which endorses the idea of stronger protection for genetically engineered plants than that afforded by the UPOV. Although an early draft specifically supported the patentability of such organisms, the final version is less explicit—leaving the way open for considerable legal wrangles. **—Bernard Dixon**

HELSINKI CONFERENCE

FUNGAL INOCULANT INCREASES SEEDLING GROWTH

HELSINKI—Curry fanciers could soon benefit from the efforts of phosphate-mobilizing fungi, according to experiments reported at the conference here on Global Impacts of Applied Microbiology. D. Kandasamay and his colleagues from the Centre of Advanced Studies in Agricultural Microbiology at Tamil Nadu Agricultural University (Coimbatore, India) have studied the response of chili plants (*Capsicum annum*) to inoculation with vesicular-arbuscular (VA) mycorrhizal fungi and/or "phosphobacteria." They inoculated either in the nursery alone or first in the nursery and again after the plants had been transplanted to the field. Using *Glomus fasciculatum* and *G. mosseae* as the fungal mixture—with or without *Bacillus* species as the bacterial partners—they found in all cases that inoculation resulted in significantly enhanced seedling height, root length, leaf production, and dry weight. But with an average yield of 9866 kg/ha of green chilies (compared with 6750 kg/ha for controls lacking inoculant), they concluded that VA mycorrhizae added in the nursery alone was as effective as introducing the fungi in the field as well. Direct measurements of phosphorus and nitrogen showed that the uptake of these elements was heightened, too.

Parallel experiments indicated that VA mycorrhizae and *Bacillus* species also have a beneficial effect on shoot length and dry weight of okra (*Abelmoschus esculentus*). In studies designed to assess the merits of different phosphatic fertilizers, Kandasamy and his team found that inoculation with the fungal mixture allowed the okra plants to utilize rock phosphate as efficiently as the much-more-expensive monocalcium phosphate or dicalcium phosphate. Although these tests were carried out in pots, the researchers expect to achieve similar results in forthcoming field trials. **— BD**

HELSINKI CONFERENCE

FINLAND ENGINEERS *B. SUBTILIS* THAT MAKES ALPHA-AMYLASE

HELSINKI—Researchers at Alko, the Finnish State alcohol monopoly here, are improving their industrial-scale production of alpha-amylase by using pKTH10, a recombinant plasmid carrying the gene from *Bacillus amyloliquefaciens* that codes for the enzyme.

Speaking at the Seventh International Conference on the Global Impact of Applied Microbiology, Jari Vehmaanpera reported that the recombinant host *B. subtilis* harboring the plasmid (first described in *Cell* **19:**81, 1982) generated up to five times as much alpha-amylase when grown on a laboratory scale in rich media than did the strain formerly used to produce the enzyme. The plasmid proved to be highly stable in a wild type host, but showed unacceptably poor stability in a strain possessing the papM9 mutation which increases the basal level of secretion. When the Alko team scaled up its cultivation of the wild type organism—using an industrially feasible medium containing low levels of free amino acids—synthesis of alpha-amylase was still about twice as high as that achieved by the traditional strain in the industrial-scale system.

B. amyloliquefaciens is known to be a better producer of extracellular enzymes than *B. subtilis*, but scientists have conducted very little research on its genetics. Therefore, even though Alko is adopting the new process based on pKTH10-containing *B. subtilis*, Vehmaanpera and his team hope they will be able to boost the synthesis of alpha-amylase even further in the future by genetic modification of *B. amyloliquefaciens*. **—BD**