Hyphae of vesicular-arbuscular mycorrhizal (VAM) fungi have been thought not to survive beyond the life of the host root. I. C. Tommerup and L. K. Abbott of the University of Western Australia, Perth, report that VAM fungi may live for at least 6 mo and probably longer as hyphae in dead roots stored at about −50 MPa water potential (= −500 bars; equilibrium relative humidity at 20 C about 65%). New hyphae grew from dead root fragments containing *Glomus monosporus, G. fasciculatus,* and *Gigaspora calospora* but not from those containing *Glomus caledonius* or *Acaulospora laevis.* The root fragments had no adhering spores, and clover seedlings grown among the fragments developed VA mycorrhizae. The new hyphae, which grew from roots obtained from the field as well as from pot culture, tended to grow within and emerge from the broken ends of old hyphae. The authors purpose that hyphae in dead roots may be an important source of VAM fungi in soil in semiarid climates. (Soil Biol. Biochem. 13:431-433)

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The herbicide 2,4,5-tricholorophenoxyacetic acid (2,4,5-T) is persistent because natural microbiota are unable to degrade the compound and derive carbon and energy from the process. The compound is slowly degraded by cooxidative metabolism, with the microorganism obtaining much of its carbon from other sources. S. T. Kellogg, D. K. Chatterjee, and A. M. Chakrabarty of the University of Illinois Medical Center, Chicago, have developed bacterial strains capable of totally degrading 2,4,5-T by using it as a sole source of carbon at high concentrations (> 1 mg/ml). The bacteria were developed through plasmid-assisted molecular breeding. Organisms obtained from various waste-dumping sites were inoculated into a chemostat along with organisms harboring various plasmids to provide appropriate genes for evolution of the desired degradative pathway. Then, 2,4,5-T was introduced into the chemostat, initially at low concentrations, but at gradually higher ones. After 8–10 mo, microbial growth occurred with 2,4,5-T as the sole source of carbon. (Science 214:1133-1135)

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Potatoes grown beneath polyethylene sheeting perforated with 9-mm slits to permit expansion as the plants grew received 93% fewer immigrant aphids than did fully exposed plants, report A. C. Wilson and L. R. Taylor of the Rothamsted Experimental Station, England. *Myzus persicae* was excluded much more effectively than *Macrosiphum euphorbiae* and other aphids, suggesting the protective effect resulted from more than a purely mechanical barrier. The authors purpose that reflection of high wavelength light by the polyethylene affected the alighting response of the aphids and that this response was affected more for *M. persicae* than for other species. The sheeting also served as a physical barrier to the aphids, including their migration from plant to plant. The method may have potential for small plots of high-value crops, such as seed crops, in areas with high risk from aphids and viruses. (Bull. Entomol. Res. 71:395-402)

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Root cells of alfalfa, cowpea, peanut, and white clover are susceptible to nodulation by rhizobia for only a short time, perhaps just a few hours during their development, according to T. V. Bhuvaneswari, A. A. Bhagwat, and W. D. Bauer of Kettering Research Laboratory, Yellow Springs, OH. Infections leading to nodulation in cowpea and alfalfa occurred most frequently in the zone where root hairs had not yet emerged at the time of inoculation and where root elongation was most rapid. Root zones more developed at the time of inoculation (eg, developing root hair zone and mature root hair zone) were considerably less susceptible to infection, interpreted by the authors to mean existence of a fast-acting regulatory mechanism preventing overnodulation. Alfalfa nodulated more frequently than did cowpea or soybean when developing and mature root hair zones were inoculated, suggesting a longer period of susceptibility to nodulation for alfalfa. (Plant Physiol. 68:1144-1149)

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The ultrastructure and nature of the root-soil interface have been clarified by R. C. Foster of the CSIRO Division of Soils, Glen Osmond, South Australia, by application of electron microscopy and histochemistry to cores of soil containing roots of wheat, *Paspalum notatum,* and *Pinus radiata* taken directly from fields. The outer tangential face of the root epidermal cells consists of three distinct layers: a cuticle, a thickened mucilaginous primary wall, and an inner compact, cellulose-rich secondary wall. The primary wall—the only wall during cell elongation—includes cellulose microfibrils embedded in a matrix of pectins and hemicelluloses and is multilaminate. Root hairs originate from lamellae adjacent to the plasmalemma and must penetrate the mucilaginous matrix as they emerge. The secondary wall is laid down as part of the tangential epidermal cell wall once cell extension has ceased; this layer may become impregnated with polyphenolics. Foster points out that many earlier authors mistakenly identified the primary wall as mucigel, believing the secondary multilamellate wall to be the entire epidermal cell wall.

The cuticle of roots grown in natural soil is quickly ruptured by mechanical abrasions and by the action of soil microorganisms. Soil particles forced into the primary wall layer become embedded in the mucilaginous materials. Thus, the so-called secreted mucilage at the root-soil interface is mainly primary wall material filled with soil particles and cells of microorganisms. The primary wall mucilage may move for some distance into the surrounding soil after the cuticle has ruptured; some soil materials were retained at the root surface for up to 20 μm from the plasmalemma. Foster emphasizes that the "mucigel" is morphologically part of the primary wall of the epidermal cells and is not a distinct mucilaginous layer. Bacteria were observed some distance from the root and were also seen to penetrate the cuticle and divide beneath it. The primary wall was rapidly lysed by microorganisms, some of which secreted capsule material. Slime on older root surfaces was mainly of microbial origin.

Foster concludes that all of the three current but seemingly contradictory views on the nature of the root surface are correct to an extent—because they each pertain to a different stage in the breakdown of the root surface by abrasion and lytic action. The newest area of the root is indeed bound by an intact cuticle, but this ruptures and releases primary wall mucilages. As these materials are removed, fibrils of the inner secondary wall become exposed. (New Phytol. 89:263-273)

Recent reports from fields related to plant pathology for inclusion in *Scientific News* may be sent to R. James Cook, 367 Johnson Hall, Washington State University, Pullman, WA 99164.