Pectolytic *Clostridium* spp. capable of rapidly rotting disks of carrot root tissue under anaerobic conditions were found in soil from 40 carrot fields and 10 fields with mixed cropping histories in eastern Scotland by D. A. Perry of the Scottish Crops Research Institute, Dundee. Dilution plate counts indicated 4.4–23.5 $\times 10^3$ viable propagules per gram of dry soil. All population estimates were made with soil air-dried for several days. The rotting potential of soil from different fields was estimated by placing disks of carrot root in contact with small volumes of soil in petri dishes and incubating the dishes at 20 C under H_2 for 8 days. Soil from fields under long-term grass leys had the lowest rotting potential and soil from potato fields had the highest. Populations of pectolytic clostridia were 1.8–8.2 times higher in the rhizosphere of carrots than in soil some distance from the carrot root surface. The author suggests that the growth of aerobic microorganisms on exudates from carrot roots creates anaerobic microsites for growth of clostridia in the rhizosphere. (J. Appl. Bacteriol. 52:403-408)

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The pathogenicity of *Botrytis cinerea* on leaves of susceptible plants varies with many factors, including availability of pollen and other sources of nutrients, inhibitory effects of other microorganisms on the leaf surface, presence of inhibitors in the leaf surface wax, and phytoalexin accumulation in the lesion. According to A. E. Brown and T. R. Swinburne of the Department of Agriculture for Northern Ireland and the Faculty of Agriculture and Food Science, Queens University, Belfast, iron in the spores of the pathogen also affects lesion development. When either of the iron-chelating agents EDTA or DHBA was added to *B. cinerea* spores in water droplets on leaves of *Vicia faba*, lesions developed faster and spread more than those resulting from only spores in water. When iron was added with the chelates, lesion development was similar to that produced with only spores in water. Spores from an iron-deficient medium also produced lesions faster and more aggressively than spores from a medium containing iron. EDTA and DHBA stimulated, and Fe-EDTA and Fe-DHBA suppressed, spore germination and appressorium formation on the leaf surface. Other recent work by Brown and Swinburne with N. K. B. Adikaram shows similar responses to iron and iron chelates for *Glomerella cingulata* on immature *Capsicum* fruit and *Colletotrichum musae* on banana fruit. (Physiol. Plant Pathol. 21:13-21)

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The genome of *Rhizobium* spp. consists of a number of large extrachromosomal elements (plasmids) in addition to chromosomal material. These plasmids carry part of the genetic information necessary for the bacterium to establish a symbiotic association with its leguminous host plant and to fix nitrogen. P. J. J. Hooykaas, F. G. M. Snijdewint, and R. A. Schilperoort of the University of Leiden, Netherlands, have shown that a plasmid of 150 Mdal from *R. leguminosarum* is a Sym plasmid (pSym 1) and carries genes for nodulation and genes for nitrogen fixation on plants of the pea-vetch cross-inoculation group. The plasmid was also expressed in *R. meliloti, R. trifolii,* and *Agrobacterium tumefaciens,* but no nitrogen was fixed in nodules induced by either *A. tumefaciens* or *R. meliloti.* The authors conclude that pSym 1 determines the host range for induction of nodules, which includes only plants of the pea-vetch cross-inoculation group. Bacteria carrying pSym 1 induced root hair deformations in clover as well as in peas and vetch. This finding is in agreement with previous observations that specificity for root nodule formation and nitrogen fixation is imposed after initiation of root hair deformations in the infection process. (Plasmid 8:73-82)

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A simple method to minimize pH changes in liquid media during the growth of microorganisms is described by D. J. Styer of the University of Wisconsin and R. D. Durbin of the U.S. Department of Agriculture, Agricultural Research Service, Madison, WI. The method involves adding a sterilizable cation exchange resin directly to the medium and offers several advantages over buffers and titration. The resin is preconditioned with either HCl (H^+-resin) or $Ca(OH)_2$ (Ca^{2+}-resin). A medium with nitrate as the nitrogen source was amended with 4 g of Ca^{2+}-resin and 1 g of H^+-resin per 50 ml. A medium with ammonium as the nitrogen source was amended with 5 g of H^+-resin per 50 ml. Without addition of cation exchange resin, pH in a medium inoculated with *Pseudomonas syringae* pv. *tagetis* rose from about neutral to 9.0 in 6 days when nitrate was used and dropped to nearly 4.0 in 6 days when ammonium was used. In the presence of resin, pH rose to only about 7.3 with nitrate and dropped to about 6.3 with ammonium. (Can. J. Microbiol. 28:986-988)

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A comprehensive and detailed study of the defenses used by nonhost higher plant species against powdery mildew fungi has been made by L. E. B. Johnson and R. J. Zeyen of the University of Minnesota and W. R. Bushnell of the U.S. Department of Agriculture, Agriculture Research Service, St. Paul. The first of an apparent series of reports concerns defenses used by 15 monocotyledonous species against *Erysiphe graminis* f. sp. *hordei* (a parasite of barley) and *E. cichoracearum* (a parasite of cucurbits). As many as 4,679 spores and 2,206 germlings were observed during the first 72 hr after inoculation for each plant species-fungus combination. A range of defenses was expressed sequentially during attempted infection, each defense leading to fewer germlings able to continue. Attrition of germlings occurred: 1) on the leaf surface, where a proportion of spores failed to germinate or form infection structures; 2) at the surface of the cuticle or cell wall, which a proportion of germlings failed to penetrate; 3) because of papillae that formed but were not penetrated; or 4) within the first cell invaded, which had a high probability of collapsing. Relatively few germlings survived to enter the cells of a nonhost; the highest frequency was by *E. graminis* f. sp. *hordei* on plants susceptible to other formae speciales of *E. graminis* (eg, wheat, oats, and rye). *E. graminis* f. sp. *hordei* germinated and produced appressoria at relatively low rates on indiangrass, sorghum, big bluestem, and corn (plant species thought to be resistant to all powdery mildews) and rarely developed beyond the appressorial stage on plants of Iridaceae and Liliaceae. On all plants, *E. cichoracearum* rarely survived beyond spore germination and appressorium formation. There was a tendency for parasite development to decrease as taxonomic distance between the nonhost and the appropriate host increased. (Can. J. Bot. 60:1068-1083)