

Electrical resistance (ER) was used by R. R. Blanchard and J. K. Carter to detect Dutch elm disease in greenhouse-grown elm seedlings. ER measurements revealed alterations in the host xylem of inoculated trees as early as 12 days before symptom expression. ER was measured in K Ω between two electrodes on each tree with a Shigometer. Disease was predicted by an ER of +30 K Ω , of +20 K Ω with an increase of +10 K Ω within the next 2 days, or of +10 K Ω for more than 3 consecutive days. The authors propose that changes in ER over time are valid indicators of Dutch elm disease. (Can. J. For. Res. 10:111-114)

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Supercoiled, circular DNA molecules of about 1,940 base pairs were found in mitochondria from the three cytoplasms—T, S, and C—identified as sources of male sterility in corn, report R. J. Kimble and R. J. Bedbrook. Mitochondria from normal (N) male-fertile cytoplasm also contained the molecules, which the investigators cite as “the first small supercoiled DNA to be found in higher plants” and suggest may be an autonomously replicated plasmid. A DNA molecule of 2,350 base pairs was found in mitochondria from N, S, and C cytoplasm but not in mitochondrial DNA from T cytoplasm. Two additional circular DNA species of 1,570 and 1,420 base pairs were found in mitochondrial DNA from C cytoplasm. Evidence is cited that these low molecular weight species of DNA in the cytoplasm are involved in male sterility. (Nature 284:565-566)

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A crown gall-specific enzyme, octopine synthase, has been purified and characterized by E. Hack and S. K. Demp. This single enzyme catalyzed the synthesis of all four N²-(1-carboxyethyl) amino acid derivatives found in an octopine-type crown gall tumor incited by *Agrobacterium tumefaciens* (strains with tumor-inducing or Ti plasmids of the octopine type). Octopine synthase is monomeric with a molecular weight of 38,000 or 39,000 daltons, depending on the method. Purification of this enzyme from tumor tissue is an important step toward showing the role of Ti plasmid genes and their translation products in crown gall. The authors point out that octopine-synthesizing activity is found

only in molluscs and certain other marine invertebrates in addition to crown gall tumors. (Plant Physiol. 65:949-955)

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Isolate SBC (72-45-1212B) of the stem rust fungus, *Puccinia graminis* f. sp. *tritici*, resulted in a resistance-type reaction on the wheat cultivar McNair 701 (CI 15288), once considered universally susceptible to the pathogen. The previously unknown gene (SrMcN) for resistance in McNair 701 also occurs in 12 cultivars originating in 10 countries, according to D. V. McVey. These cultivars apparently do not have a common parentage, and the author suggests that the gene was unintentionally incorporated into the different cultivars because of a linkage to other traits considered desirable by the plant breeders. (Crop Sci. 20:275-277)

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A new race of *Puccinia striiformis* has been identified under laboratory conditions by R. G. Wright and J. H. Lennard. The question of how new races arise has been unresolved with *P. striiformis*, which has no known sexual stage. The authors list four mechanisms by which the new race may have arisen after inoculation of susceptible and differentially resistant wheat cultivars with a mixture of two known races of the pathogen. Evidence favored reassortment of whole dikaryotic nuclei and did not support extranuclear inheritance, mutation, or parasexuality. The authors propose a model to illustrate and account for their findings on the basis of the new race having one nucleus from each of the two original races. The genotypes of the two original races were such that one of the two new races possible from reassortment of nuclei would be avirulent on all differentials; this would explain why only one new race was detected. (Trans. Br. Mycol. Soc. 74:283-287)

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Equipment described by P. P. Kormanick, W. G. Bryan, and R. C. Schultz for staining large numbers of plant root samples to detect endomycorrhizae includes 28 tissue-staining capsules sandwiched between two stainless steel mesh screens. The screens are fastened together with stainless steel channel clamps. The unit fits into a rectangular

casserole, and solutions for clearing and staining the roots are poured into and out of the dish. Two formulations are effective. The one with lactophenol should be used only when great clarity of fungal structures is required and safety precautions for phenols are observed. The less toxic lactic acid method is recommended for routine studies. (Can. J. Microbiol. 26:536-538)

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Five biological species of *Armillaria mellea* from Europe and 10 from North America have been described by K. Korhonen in Helsinki, Finland, and J. B. Anderson and R. C. Ullrich in Vermont, respectively. Each species is characterized by a bifactorial heterothallic pattern of sexuality, with multiple allelic incompatibility factors. A biological species is distinguished solely on the basis of interfertility; intersterile strains are assigned to different species. Joint studies by the investigators revealed that three European species are interfertile with three North American species and that one European species is interfertile with two North American species that are themselves intersterile. Also revealed was a genetic mechanism besides mating type that reduces compatibility or growth rate of isolates used for intersterile pairings. The authors suggest that separation based on this mechanism as well as physical location is contributing to speciation in *A. mellea*. (Exp. Mycol. 4:87-95)

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Early morphological changes during ectomycorrhizal formation can be observed with a technique utilizing transparent polyester pouches, according to J. A. Fortin, Y. Piché, and M. Lalonde. External mycelia of *Pisolithus tinctorius* and *Cenococcum graniforme* were observed before and after formation of ectomycorrhizae on *Pinus strobus* seedlings grown in the pouches. With appropriate modifications, the technique should be applicable to other root-based investigations. (Can. J. Bot. 58:361-365)

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