A model for predicting yield loss in grain sorghum caused by systemic sorghum downy mildew (*Peronosclerospora sorghi*) has been developed by D. M. Tuleen and R. A. Frederiksen of Texas A&M University, College Station. The model applies only to systemic infections in plant populations essentially free from other foliar diseases, including foliar sorghum downy mildew. Developed from data obtained from field experiments carried out over several years in southern and central Texas, the model is sensitive to the plant population, and empirical data indicate that a low incidence of systemic infection, by thinning the stand, allows healthy plants to perform better and compensate for killed seedlings. The model is also sensitive 1) to disease reaction by the hybrid, indicating the extent to which genetic resistance reduces yield losses, and 2) to rainfall after planting, predicting low incidence of disease if rainfall occurs 4–7 days after planting. Multiple regression analysis of seven data sets from field tests conducted in 1975 and 1979 revealed that the model simulated grain yield acceptably. (Agron. J. 73:983-987)

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Dry seeds planted in moist soil imbibe water rapidly and leak considerable amounts of solutes during the first day or two or even the first few hours. Membranes are in a disorganized state while the seeds are dry and offer little resistance to movement of water in or of solutes out. As membranes hydrate and reorganize into a continuous bilayer configuration, semipermeable properties are restored. J. B. Murphy and T. C. Noland of the University of Arkansas, Fayetteville, have shown that the temperature effect on initial rates of imbibition of radish seeds and excised sugar pine embryos is a function of water viscosity, the relationship being approximately linear between 5 and 35 C. The results support previous conclusions that water uptake by seeds is a physical rather than a physiological process. The authors suggest that previous evidence for a physiological mechanism must be discounted because the seed material used—with impermeable coats, bulky storage tissue, or high starch content—would tend to mask the subtle relationship of water viscosity to rate of imbibition. Involvement of membranes in both imbibition and solute leakage was also indicated by the higher rates of imbibition and solute leakage in heat-killed radish seeds and sugar pine embryos than in live material. Sugar pine embryos also showed an abrupt change (increase) in both imbibition and solute leakage above 15–20 C, suggesting a change in membrane integrity similar to that associated with chilling damage in certain germinating seeds. (Plant Physiol. 69:428-431)

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Genetics of the host-pathogen relationship for rust diseases of perennial plants have not been studied like those of annual plants, owing in large part to longer generation times and greater difficulty of working with large populations. G. I. McDonald and D. S. Andrews of the Intermountain Forest and Range Experiment Station, USDA Forest Service, Ogden, Utah, have found that the interaction between cultures of *Cronartium ribicola* and clones of *Ribes hudsonianum* var. *petiolare* (the telial host) is characterized by both general and specific resistance as known for grass-rust interactions. General resistance is associated with an increased latent period and decreased infection intensity. Specific resistance is thought to have a gene-for-gene relationship. Seven clones of ribes were tested initially, then detailed studies were done of two clones of the host inoculated with urediospores from 132 single-aeciospore cultures representing 19 aecia that showed a significant aecium × clone interaction. Current management of white pine blister rust involves deployment of rust-resistant pines (the aecial host). The kind of resistance in the ribes population must also be considered in understanding the race picture and epidemiological relationships in this disease. (For. Sci. 27:758-763)

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A factor in sweet potato roots that agglutinates spores of *Ceratocystis fimbriata* in the presence of Ca^{+2} and that may play some role in the failure of the taro, oak, cacao, prune, and coffee strains of this fungus to cause black root rot of sweet potato has been partially characterized by M. Kojima, K. Kawakita, and I. Uritani of Nagoya University, Japan. The factor also agglutinates A, B, AB, and O types of human erythrocytes in the presence of Ca^{+2}. The agglutinin contains galacturonic acid and may be a pectic acid-like substance. Spores of the five strains and of the almond and sweet potato strains were agglutinated when ungerminated. Germinated spores of the almond and sweet potato strains—but not of the other five—were insensitive at pH 6.5, the pH of sweet potato root tissue; all germinated spores were sensitive at pH 5.5 and 7.5. The authors suggest that receptors involved in agglutination are in a dynamic state and involve ionic interaction and that the sweet potato strain succeeds because of differential insensitivity to agglutination when germinated at the pH of sweet potato roots. The exceptional behavior of the almond strain could not be explained. (Plant Physiol. 69:474-478)

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Ex Rico 23, a cultivar of common bean (*Phaseolus vulgaris* L.) developed by Centro Internacional de Agricultura Tropical (CIAT) in Colombia, had significantly less infection and yield loss caused by white mold (*Sclerotinia sclerotiorum*) than three recommended cultivars in studies by J. C. Tu and W. D. Beversdorf of Agriculture Canada, Harrow, Ontario. The tests were conducted over 3 yr in large as well as small field plots. The incidence of white mold was lower and the rate of disease progress was slower in Ex Rico 23 than in Fleetwood, a standard cultivar. Yield loss in 1980 was minimal for Ex Rico 23 and 25–50% for Fleetwood. (Can. J. Plant Sci. 62:65-69)

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Bacteriocins—molecules produced by bacteria that kill strains closely related to the producer—have been shown to occur in several genera of Gram-positive and Gram-negative bacteria. F. Rodriguez-Valera, G. Juez, and D. J. Kushner of the University of Ottawa, Ontario, Canada, report the discovery of bacteriocins (halocins) in halophilic bacteria, including extreme halophiles. This group of bacteria shows little similarity to other prokaryotes, except the methanogens and certain thermoacidophiles. One halocin studied in detail caused both death and lysis of the sensitive bacterium, also a halophile; this halocin was of high molecular weight, was destroyed by heat and by protease, but was not a virus. Halophilic bacteria belong to the archaebacteria, and the authors suggest that finding bacteriocins in the archaebacteria is evidence for the "near universality of these substances." (Can. J. Microbiol. 28:151-154)

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