Microorganisms can be divided into four classes based on the method used for osmoregulation under water stress conditions, according to comprehensive studies and a review of the literature by R. F. Harris of the University of Wisconsin, Madison. Class I and class II microorganisms are mainly gram-negative bacteria. The cells of these microorganisms have a solution water potential of about −7 bars, owing to the solutes naturally present in the cytoplasm, ie, basal intermediary metabolites. Class I microorganisms cannot induce or accumulate compatible solutes and therefore lose turgor and stop growing at about −7 bars, lower if solutes are absorbed from the environment or the cell wall shrinks. Class II microorganisms can induce and accumulate compatible solutes (eg, amino acids, polyols) and therefore can osmoregulate below −7 bars in response to water stress. *Spirillum* spp. are class I microorganisms and *Pseudomonas, Escherichia,* and *Klebsiella* spp., class II. Class III microorganisms include gram-positive bacteria and have a normal cellular solution potential of about −25 bars. Such cells in pure water (water potential = 0) would have +25 bars turgor, which Harris suggests accounts for the strong wall of these bacteria. However, like class I microorganisms, they cannot induce compatible solutes and therefore lose turgor when in equilibrium with an environment of −25 bars, except to the extent that solutes are absorbed from the environment. Class IV microorganisms include most streptomycetes, certain yeasts, filamentous fungi, and halophilic bacteria. They are similar to class III microorganisms but are able to osmoregulate by induction and accumulation of compatible solutes and therefore can maintain turgor and are able to grow in drier environments. (Water Potential Relations in Soil Microbiology, J. F. Parr et al, eds. Soil Science Society of America Special Publication No. 9)

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Maize sterile stunt virus (MSSV) is the name given by R. S. Greber of the Queensland Department of Primary Industries, Indooroopilly, Australia, to a rhabdovirus causing severe stunting and sterility of a few susceptible maize genotypes and reported earlier by him to occur in Australia. Most maize lines are resistant and resistance is highly dominant genetically. Field incidence of infection often exceeds 90% in susceptible lines, some of which have been used in breeding programs. Particle dimensions are 230 × 50 nm in negative stain and 255 × 45 nm in thin section. Symptoms resemble those produced by maize mosaic virus (MMV), also a rhabdovirus, but the two viruses differ in several respects. MSSV does not affect maize lines susceptible to MMV, and its main vector, *Sogatella longifurcifera* (a delphacid planthopper), is not reported to be a vector of MMV. Also, particles of MSSV are found only in the cytoplasm of infected cells, whereas particles of MMV bud from the inner nuclear membrane of host cells and accumulate in the perinuclear space and associated cisternae of infected cells. Maize is the only common host of the two viruses. MSSV also infects wheat, barley, triticale, and certain grasses. A major source of the virus is barnyardgrass (*Echinochloa colona*), a common weed in maize plantings in eastern Australia. (Aust. J. Agric. Res. 33:13-23)

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In segregating families representing five winter wheat cultivars differing in height and in resistance to *Septoria nodorum* and reciprocally crossed in all combinations, height and resistance were positively correlated, report P. R. Scott, P. W. Benedikz, and C. J. Cox of the Plant Breeding Institute, Cambridge, England. The correlation could not be explained by chance association between the two characters. Rather, the association involves linkage or, more likely, pleiotropy. The authors offer several mechanisms to account for pleiotropy: *S. nodorum* is less able to move by water-splash dissemination to the upper leaves and ears on taller plants; microclimate limits infection more in the canopy of a taller crop; or genetically taller plants are inherently more vigorous and hence more resistant. Resistance was also related somewhat to lateness, independent of height. The authors suggest that since *S. nodorum* infects older tissue more readily than younger tissue, perhaps advanced lines become more susceptible earlier in the season. One implication for plant breeding is the possible need to select resistance at a given height. (Plant Pathol. 31:45-60)

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Previous reports on the occurrence and distribution of *Azotobacter* spp., the free-living, aerobic nitrogen-fixing bacteria, have indicated highest populations in moist or irrigated soils but a general absence in nonirrigated soils. W. H. Fuller and K. Hanks of the Arizona Agricultural Experiment Station, Tucson, found *Azotobacter* spp. in abundance in nonirrigated desert soils of the Southwest, including dry arroyos and rangelands. At one study site, mean population values for alfalfa fields, rangelands, home gardens, stock ponds, and virgin desert soils were, respectively, 1.5×10^4, 2.3×10^4, 3.1×10^4, 1.1×10^4, and 4.6×10^2. The findings support other recent reports of wide distribution of *Azotobacter* spp. in arid and semiarid soils of Iran and Egypt. The authors submit that historical concepts about a general absence of these bacteria in harsh soil environments are in error. (Plant Soil 64:355-361)

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Armillaria mellea depends on a woody food base for some nutrients during growth as rhizomorphs through soil but, all other factors being equal, the amount of growth is determined mainly by the nutrient content of the soil, according to D. J. Morrison of the University of Cambridge, England. Depletion of nitrogen, phosphorus, and potassium from the food base was no greater by good rhizomorph growth in soil with high organic matter levels than by poor rhizomorph growth in mineral soil, even though rhizomorphs from soil high in organic matter contained more nitrogen and potassium than those from soil low in organic matter. Nutrients absorbed along the rhizomorph were translocated toward the tip rather than the food base. The author suggests the greater supply of nutrients in the humus layer of soil than in the impoverished mineral subsoils accounts for rhizomorph growth and concludes that the soil is the principal source of nutrients. (Trans. Br. Mycol. Soc. 78:201-207)

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Sporulation of the flax rust fungus (*Melampsora lini*) in axenic culture on chemically defined medium was enhanced by "mimicking" an epidermis on top of the mycelium, report R. Boasson and M. Shaw of the University of British Columbia, Vancouver. Parafilm or other material relatively impermeable to gas exchange placed in direct contact with the mycelium increased sporulation 10-fold or more. The effect was strictly localized to the areas in contact with the film. When film was applied before a certain critical age of the mycelium, the effect persisted and spores continued to form for a few days after film removal; when film was applied after the critical age, the effect declined. The authors offer several physical effects in addition to restriction of gas exchange to explain the effect. (Exp. Mycol. 6:1-6)

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