Nitrification in soil may contribute as much as 15×10^6 metric tons of nitrogen as NO and $5-10 \times 10^6$ metric tons of N_2O to the atmosphere on a global basis, according to estimates by F. Lipschultz and associates of Harvard University, Cambridge, MA. The estimates are based, in part, on results from experiments on the relative rates of production of NO, N_2O, and NO_2 from ammonium by *Nitrosomonas europaea* under different sets of controlled conditions (mainly different oxygen tensions) and agree with an earlier report cited by the authors. From 0.3 to 10% of the ammonium oxidized by the bacterium in a soil culture was released as NO and N_2O. There are several estimates of the contributions of denitrification to NO and N_2O in the atmosphere, but little research has been done on the contributions of nitrification. The magnitude of NO attributed to nitrification is thought to be similar to earlier estimates of NO production by combustion, photoxidation of NH_3, decomposition of stratospheric N_2O, and lightning. (Nature 294:641-643)

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Benomyl at 200–5,000 ppm increases development of tillers in wheat crops, which could account for the small yield increases noted with this and similar fungicides in the absence of detectable disease, report W. E. Peat and D. M. Shipp of Wye College, Ashford, England. Wheat grown on land not used for cereal crops for many years appeared to be disease-free. A small but consistent increase in tillering occurred in response to sprays at any of several growth stages, including at heading (ear emergence). The effect was faster initiation of tillers, not acceleration of growth after initiation of tillers. The responses resemble those of cereals to cytokinin application. The net effect of treatment varied with plant density; where plants were widely spaced, increased tillering was reflected in more heads, but as plant density increased, more tillers died in treated than in nontreated plots. (EPPO Bull. 11:287-293)

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Studies under defined laboratory conditions have generally indicated that sufficiently intense artificial light inhibits germination of rust urediniospores. I. K. Knights and J. A. Lucas of the University of Nottingham, England, studied germination of urediniospores of *Puccinia graminis* f. sp. *tritici* in the field under typical summer light intensities outside and within the leaf canopy. Spores exposed to sunlight did not germinate until near sunset, when light intensity dropped below 5,000 lux, whereas control spores on agar blocks maintained in the dark germinated immediately. The same diurnal pattern of germination occurred within the crop canopy, where relative humidity was higher and light intensity was lower by as much as 70%. Even light intensity on the soil surface on a cloudy day inhibited germination, but spores at this position germinated sooner than those higher in the crop canopy at lower light intensity. Germination during the night helps ensure adequate dew and other conditions for prepenetration growth; the rise in temperature and drop in leaf cell turgor at dawn probably favor the later stages of the infection process. (Trans. Br. Mycol. Soc. 77:519-527)

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Iron is among the most common elements in soil, yet levels in the soil solution are often too low for adequate nutrition of plants because of extreme insolubility of ferric iron at alkaline and neutral pH. Iron-chelating (siderophore) compounds enhance availability of iron to plant roots, but whether roots or rhizosphere microorganisms, or both, produce these compounds is unclear. P. S. Szaniszlo and P. E. Powell of the University of Texas, Austin, and C. P. P. Reid and G. R. Cline of Colorado State University, Fort Collins, surveyed numerous ectomycorrhizal fungi and found that 14 strains distributed among three basidiomycete families produced significant quantities of hydroxamate siderophores (HS), which are ferric-specific iron-transport molecules. These investigators previously had reported the existence of large reservoirs of HS adsorbed to soil organic matter and had proposed that these compounds perform many chelate functions formerly attributed to organic and polyphenolic humic acids. Detailed studies with one fungus, *Boletus edulis,* revealed that production of HS was highest on media low in iron. The authors propose that ectomycorrhizal fungi provide iron to roots by liberating extracellular HS into the rhizosphere. (Mycologia 73:1158-1174)

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Existing methods to measure the water potentials (activities or energy status) in plant tissues or other materials are limited to about −100 bars, with many limited to −75 or higher (wetter). The equilibrium relative humidity of −75 bars is about 95%. Many microorganisms can grow at water potentials below −100 bars and survive down to −1,000 bars and lower. H. H. Wiebe of Utah State University, Logan, describes a two-step procedure for measuring water potential of materials anywhere between free water and oven dryness; a commercially available Peltier thermocouple psychrometer is used. In the first step, water is condensed on the Peltier-cooled thermocouple junction for several minutes from air over free water (100% RH). A sample is then inserted under the wet thermocouple and the maximum psychrometric cooling is measured at about 10 sec. The system is calibrated with saturated salt solutions of known water potentials. In intact and ground wheat grains previously equilibrated to different water contents over various saturated salt solutions, water potential decreased in a curvilinear fashion as water contents decreased. Problems with the method are discussed. (Plant Physiol. 68:1218-1221)

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The use of foliar fungicides for wheat and barley has increased greatly in Europe over the past 10 yr and is now a standard part of intensive cereal production. While the relationship between disease control and yield is usually good, some effects are unexpected. R. J. Cook of the Agricultural Development and Advisory Service, Cardiff, Wales, reports an average yield increase of about 3% not related to disease level. Application of tridemorph to spring barley in England sometimes lowers yield. In Germany, about 10% of the unexpected yield effects after use of carbendazim or captafol are negative, but the overall average indicates a 2–3% increase not related to disease level. Possible explanations include extension of green leaf survival by fungicides with cytokininlike activity (eg, carbendazim compounds) or suppression of leaf colonists (eg, *Alternaria* and *Cladosporium* spp.). An influence on stability of the leaf microflora favorable to *Typhula* and *Rhizoctonia* spp. is suggested as the possible cause of the occasional yield reduction. (EPPO Bull. 11:277-285)

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.