

Scientific News

Nonchromosomal inheritance in higher plants can be studied through the use of somatic cell hybridization. Using this approach with tobacco, A. Belliard, F. Vedel, and G. Pelletier in France produced evidence of mitochondrial recombination following protoplast fusion. The mitochondrial DNAs of cytoplasmic hybrids (cybrids) were shown by distinct markers to be different from those of either parent or a mixture of the parents. (Nature 281:401-403)

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Isogenic lines of a crop species, when available, provide an excellent tool for experimentally measuring losses from specific plant pathogens. J. W. Johnson and co-workers in Maryland found that, under natural field conditions, 'Chancellor' wheat susceptible to powdery mildew yielded 34% less than isogenic-resistant Chancellor. The susceptible lines produced grain with less flour protein, but powdery mildew did not affect overall milling and baking quality of the grain or flour. (Crop Sci. 19:349-351)

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M. E. Whalon and Z. Smilowitz developed a model for predicting populations of green peach aphid (*Myzus persicae*) and are testing the model in potato fields in Pennsylvania. A laboratory estimate of generation time is used to derive the expected number of generations based on field-accumulated degree-days. The model is being tested as a means to evaluate various control strategies and to decide when to spray, based on temperature forecasts. The model is most accurate in the range of temperatures associated with the shorter generation times. (Can. Entomol. 111:1025-1032)

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Although corn lines with Texas (T) male-sterile cytoplasm are highly susceptible to *Helminthosporium maydis* race T, certain quantitatively inherited nuclear genes identified in recent years confer some resistance in corn to race T. Resistance to race O of *H. maydis* is determined solely by nuclear genes. Work by I. G. Gaunter and V. E. Gracen in New York provides evidence that the nuclear genes conditioning resistance in corn to

H. maydis are the same for both races. Results also suggest that the resistance genes function both additively and on a gene-for-gene basis with virulence in the pathogen. These workers suggest that possibly the majority of nuclear genes that condition resistance to race T in the corn lines they studied also condition resistance to race O. (Crop Sci. 19:333-336)

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The hispine leaf miner (*Odontota horni*) is a native North American oligophagous species adapted to certain Leguminosae such as *Amphicarpa* and *Desmodium* spp. Work by M. and D. D. Kogan in Illinois has shown that this pest is now adapted to soybeans. Although the hispine leaf miner is not considered a serious pest of soybean, the work demonstrates once again the capacity of certain insect pests with specialized host ranges to adapt to an introduced crop. (Ann. Entomol. Soc. Am. 72:456-461)

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Removal of 2 mm of the primary root tip of a pea plant completely halted elongation of the damaged root but did not affect lateral root formation, according to P. B. Goodwin and S. C. Morris in Australia. Application of auxins (indole-3-acetic acid or 1-naphthaleneacetic acid) to the cut root stub increased lateral root formation, whereas abscisic acid, gibberellins A₃ and A₇, the cytokinins BAP and 2iP, and an ethylene absorbant all decreased lateral root formation. The results indicate that auxins produced in the stem and primary signals in apical dominance in the stem promote lateral root formation, whereas cytokinins produced in root tips and which inhibit lateral root formation promote lateral stem outgrowth. (Aust. J. Plant Physiol. 6:194-200)

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The ability of *Arthrobotrys oligospora* to trap and hold nematodes may be the result of a lectin on the traps of the fungus that binds to a carbohydrate on the nematode surface, according to W. Nordbring-Hertz and B. Mattiasson at Lund, Sweden. Certain carbohydrates, namely, N-acetyl-galactosamine, applied as solutions to the fungal mycelium in advance of nematodes resulted in total

inhibition of nematode capture over a 24-hr period. The same carbohydrates applied to the nematode had no effect on their subsequent capture, suggesting that the lectin is on the fungus trap and not on the nematode. Exposure of the fungal mycelium to an excess of red blood cells (from different blood groups and carrying different polysaccharides on their surfaces) resulted in significant capture of the cells by the capture organs only. (Nature 281:477-479)

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Work by B. A. Stynes and associates in Australia presents evidence that a toxicity of annual ryegrass to sheep following infection of the ryegrass by a nematode (*Anguina funestor*) and an associated yellow-slime bacterium (*Corynebacterium rathayi*) is caused by a phytoalexin-type compound formed in ryegrass tissues in response to the bacterium. The nematode was shown by others to vector the bacterium to the ryegrass inflorescence. Galls are the main symptom of infection and source of the toxin when eaten by sheep. The highest concentration of toxin is found in the plant component of the gall, suggesting that the toxin is of plant, not bacterial, origin. (Aust. J. Agric. Res. 30:201-209)

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Resistance in alfalfa to the stem nematode (*Ditylenchus dipsaci*), thought to be a quantitatively inherited character controlled by many genes, can be explained in terms of two complementary, dominant, tetrasomically inherited genes, Sn and Sn₁, according to J. H. Elgin. He suggests that earlier interpretations of genetic data were made before alfalfa was recognized as an autotetraploid. He analyzed earlier data in the light of the autotetraploid nature of alfalfa and found that those results also can be explained in terms of a tetrasomic inheritance pattern. (Crop Sci. 19:352-354)

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.