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Smarter Pest Control

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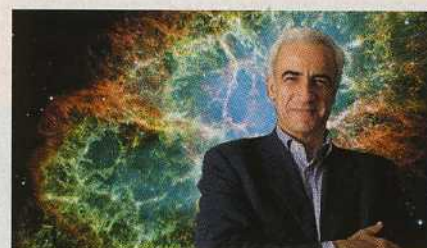
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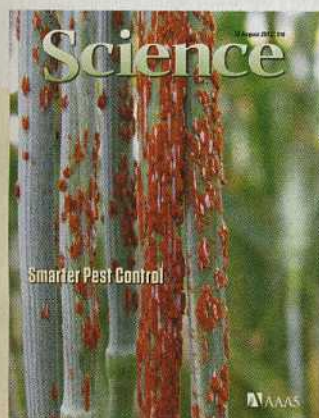
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>> **Science Podcast**
Listen to a special show focused on smarter pesticides, including stories on preventing pesticide suicides, RNA interference for bugs, and manipulating the plant immune system.

>> **Find More Online**
Check out *Science Express*, our podcast, videos, daily news, our research journals, and *Science Careers* at www.sciencemag.org.



COVER

Stem rust fungus Ug99 is deadly to unprotected wheat strains (two stems on the right), but not to those protected by innate resistance genes (three stems on the left). In this special issue, we explore past and future strategies for responding to diseases and infestations caused by pests. The solutions demand our best knowledge of chemistry, immune responses, and ecosystem stability. See page 728.

Photo: Evans Lagudah and Zak Pretorius

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726 Mapping Neuronal Diversity One Cell at a Time

H. Wichterle et al.

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767 The Xist lncRNA Exploits Three-Dimensional Genome Architecture to Spread Across the X Chromosome

J. M. Engreitz et al.

A large noncoding RNA uses folds within the chromosome to drive the spread of a chromatin repressive complex.

Research Article Summary; for full text:

<http://dx.doi.org/10.1126/science.1237973>

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768 All-Optical Switch and Transistor Gated by One Stored Photon

W. Chen et al.

Optical transmission through a cesium-filled cavity can be controlled by a single stored photon.

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771 Control of Metal Nanocrystal Size Reveals Metal-Support Interface Role for Ceria Catalysts

M. Cargnello et al.

Comparing nanocrystals of different sizes on different oxides shows that ceria-metal interface sites enhance carbon monoxide oxidation.

774 Incision into the Eastern Andean Plateau During Pliocene Cooling

R. O. Lease and T. A. Ehlers

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777 Basal Drainage System Response to Increasing Surface Melt on the Greenland Ice Sheet

T. Meierbachtol et al.

Basal drainage structures at the edges of the Greenland ice sheet differ from those found farther in the interior.

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779 Earliest Evolution of Multituberculate Mammals Revealed by a New Jurassic Fossil

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A fossilized skeleton reveals the origins of diverse feeding and locomotor adaptations of once-common rodent-like multituberculates.

783 Identification of Wheat Gene *Sr35* That Confers Resistance to Ug99 Stem Rust Race Group

C. Sainetac et al.

786 The Gene *Sr33*, an Ortholog of Barley *Mla* Genes, Encodes Resistance to Wheat Stem Rust Race Ug99

S. Periyannan et al.

Two resistance genes are identified that could protect wheat from a virulent fungus that can severely reduce crop yields.

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789 A Long Noncoding RNA Mediates Both Activation and Repression of Immune Response Genes

S. Carpenter et al.

In mice, a broadly acting RNA, lincRNA-Cox2, regulates the circuit that controls the inflammatory response.

792 Cleavage of Fibrinogen by Proteinases Elicits Allergic Responses Through Toll-Like Receptor 4

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Allergic inflammation requires proteinase-dependent cleavage of fibrinogen that activates innate immunity through Toll-like receptor 4.

796 Recurrent Insect Outbreaks Caused by Temperature-Driven Changes in System Stability

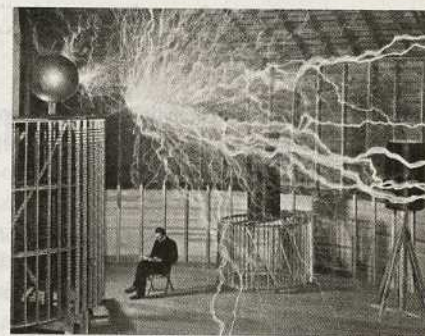
W. A. Nelson et al.

Seasonal temperature changes destabilize population cycles in the tea tortrix moth and drive the timing of pest outbreaks.

800 A Gut Lipid Messenger Links Excess Dietary Fat to Dopamine Deficiency

L. A. Tellez et al.

In mice, a high-fat diet functionally disrupts a gut lipid that controls the brain's perception of the reward value of food.



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