

SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

It's Only Natural

Conserving, protecting and enhancing natural resources.

Agriculture, our most basic and important industry, is more than just growing crops or raising livestock for expanding domestic and world markets. It's also about managing precious natural resources and protecting fragile ecosystems that we share with other living things. Clean water, soil and air are essential for sustainable agriculture and a healthy environment. Scientists and extension specialists at Land-Grant universities are leading the way in protecting natural resources while also providing the public with factual, scientific information and educating students to be effective stewards of the land.

Payoff

- **Sky-high tech.** Researchers at **Auburn** are helping Alabama farmers use new satellite remote sensing technologies to divide fields into "management zones" so that fertilizers and pesticides can be applied to row crops according to site-specific needs. This reduces fertilizer costs and preserves water quality. The timber industry uses these precision agriculture technologies for soil surveys, mapping and timber harvesting.
- **Clearly better.** When Lake Tahoe's legendary clarity was threatened by pollution from personal watercraft and motorboats, **Nevada** researchers conducted the first study of gasoline engines used on the shimmering alpine lake. They found that older two-stroke engines caused more water pollution than four-stroke engines. As a result, the bi-state (Nevada and California) Tahoe Regional Planning Agency banned two-cycle engines on the lake in 1999. During the first summer of the ban, gasoline compounds in the lake were reduced by 80 percent.
- **Special treat.** More than 400 million cubic feet of wood used for decks, fences and other outdoor products in the United States are treated with a chemical, chromated copper arsenate, to prevent decay, fungi and insect damage. Until recently, chemical leaching from buried wood or toxic gas from burning treated wood threatened the environment. **Michigan State** scientists have developed a process that removes 95 to 100 percent of the chemical so that treated wood can be recycled into other commodities without harming the environment. Scientists hope to patent the process, and commercial firms are eager to license it.

**RESEARCH,
EXTENSION AND
EDUCATION
AT WORK**

SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

- **Environmental stewardship.** Healthy forests are essential for sustaining New Hampshire's \$1.7 billion forest products industry, as well as tourism, wildlife habitats and water supplies. Thanks to a stewardship incentives program (SIP) initiated by **New Hampshire** Extension, more than 1,500 landowners on 54,000 acres of forestland have received direct technical assistance. The cost-share program provides financial incentives to landowners who implement stewardship practices. The program has already protected recreation on 2,146 acres, wildlife habitat on 4,566 acres, wood production on 5,339 acres and water supplies on 2,276 acres. A **Rhode Island** municipal watershed training program reached more than 700 community leaders, resource managers and professionals in 90% of the state's communities.
- **Nixing nitrogen.** While it's a valuable plant nutrient, nitrogen can move from farm fields to groundwater and surface waters, posing a human health risk. To protect the environment and increase crop yields, **North Carolina State** scientists have developed a controlled drainage system to decrease nutrient runoff from fields into surface water. On farms using the new system, about half the nitrogen previously lost to surface water is converted to nitrogen gas. The practice is used on 600,000 farms in the state, and in other states and countries.
- **Burning question.** For years, **Oregon** grass seed growers burned fields after harvest to control diseases, battle weeds and stimulate new growth. While burning helped growers, local residents fumed. After a smoke-related accident on Interstate 5, state legislation severely limited burning. To help growers adopt alternatives to field burning, **Oregon State** Extension initiated on-farm demonstration projects based on more than 20 years of research. The alternatives have reduced burning while maintaining crop yields, seed quality and profitability.
- **Mending mines.** Acid drainage, mainly from abandoned coal mining sites, has polluted streams in the north central Appalachian region of the United States. While the cost of reclaiming all mines is prohibitive, restoration methods developed by **West Virginia** researchers are improving water quality in streams by

as much as 50 percent. Passive treatment methods, such as new wetlands, limestone channels and ponds, are enhancing water quality in streams so they can be stocked with trout. In many cases, water from contaminated sites now contains almost no acidity and metals, thanks to new restoration methods.

- **Cooperative compliance.** When the **California** livestock industry agreed to clean up its act for the State Water Resources Control Board in 1995, **University of California-Davis** Extension specialists developed a highly successful Ranch Water Quality Planning Short Course. The 20-hour course includes instruction on water quality laws, control of non-point pollution sources, and hydrology in upland watersheds and streams. As a result, producers on 500,000 acres along the north and central coasts, in the San Joaquin Valley foothills and in the Sierra Nevada have achieved voluntary and cooperative compliance with the federal Clean Water Act and the Coastal Zone Management Act.
- **Ice isn't always nice.** Many states use salt to melt ice-packed roads, but salt causes cars to rust, hurts roadside plants and diminishes water quality. To minimize environmental and other impacts, **South Dakota State** scientists have developed a new de-icer made of corn byproducts and lime. The organic material is completely biodegradable and works just as well as regular road salt. The new de-icer also creates a new use for corn.



**Cooperative State Research, Education,
and Extension Service**
United States Department of Agriculture

Cooperative State Research, Education, and Extension Service in cooperation with the Extension Committee on Organization and Policy, the Experiment Station Committee on Organization and Policy, the Academic Programs Committee on Organization and Policy, the International Programs Committee on Organization and Policy, and the Louisiana State University Agricultural Center.

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.)