

Cornell ag and life sciences research wide-ranging

ITHACA, N.Y. — What do the following have in common?

The development of low-lactose ice cream and opaque containers to protect milk; techniques to improve home lawns and predict potholes; research to assess the quality of Adirondack water supplies, to bring back polluted lakes, and to understand why most Canada geese don't migrate as far as the Carolinas anymore; and studies ranging from electric fish, phosphorescent bacteria, and annoying caddisflies to mites that attack honey bees, and the relationship of protein to cancer.

They are just a few of the wide-ranging research projects conducted last year in the New York State College of Agriculture and Life Sciences at Cornell University. In addition to a focus on agriculture and agricultural economics, the College is devoted to the life sciences, food technology, nutrition, education, and communication. Its research reflects the scope and depth of study that benefits consumers, educators, and scientists in many disciplines.

Cornell food scientists, for example, have developed an ice cream that is low in lactose, a milk sugar that many people around the globe cannot digest. The ice cream has up to 75 percent less lactose and 50 percent more protein than normal.

Other Cornell food scientists succeeded in developing an opaque milk container that blocks the penetration of light. The new creamy-yellow plastic container minimizes flavor and nutrient losses that are common with glass and translucent plastic containers.

Potholes cost American motorists an estimated \$40 billion annually. If roads are repaired at the right time, however, potholes will not crop up on streets and highways. In a Cornell highway engineering study, a road test device — the "Falling Weight Deflectometer" (FWD) — was proven effective in pinpointing where, when, and how roads should be repaired. Widespread use of the device could result in better quality roads and substantially reduced maintenance costs.

Two-thirds of the public and one-half of the private community water systems in New York State's Adirondack Park have been contaminated by animal wastes in recent years, a Cornell study revealed. Furthermore, many of the community water systems are seriously understaffed and soon will be in need of major repairs. A Cornell rural sociologist also found that nearly half of the public and two-thirds of the private water systems are not tested for contamination at the required intervals.

As part of a larger Adirondack Park study, a Cornell agricultural economist determined that the natural resources in the park are critical to the survival of the inhabitants of communities in these majestic New York mountains. After wages and social security checks, the people of the area rely on the natural resources for food, fuel, and, in some cases, a basic livelihood.

In a project aimed at alleviating the problem of millions of moth-like insects called "caddisflies" that invade communities each summer along the Niagara River between Buffalo and Niagara Falls, Cornell entomologists are exploring several biological control measures. Possible solutions include the use of: "black light" traps to lure the critters and

kill them en masse; fish that prey on the larvae dwelling on the rocky river bottom; and a certain fungal species that causes a disease deadly to the bugs.

On other fronts, Cornell researchers found a way to keep a new kind of colorful flower — the "Alstroemeria" — blooming at any time of the year. This paves the way for year-round production of this flower for consumers. Other good news for home gardeners and growers is an increase in pepper yields — up to 2,000 bushels an acre; that's seven to ten times the average yield in the northern parts of the United States. A package of cultural practices to boost the pepper yield was perfected by a Cornell scientist.

Some plants and microorganisms enjoy peaceful coexistence, a phenomenon known as symbiosis. A Cornell scientist discovered that a group of fungi called VA mycorrhiza takes up residence in the roots of many types of lawn grasses, boosting the growth of grasses even when soil is poor in phosphorus and moisture. Just how the fungus helps grass grow remains a scientific puzzle, but it may help home owners keep their lawns greener and healthier under low-maintenance conditions.

In another lawn study, Cornell researchers successfully tracked down the real culprit of Fusarium blight, a major lawn disease that creates ugly patches of dead grasses in home lawns and golf courses in summer. At least two types of little known fungi turned out to be the offenders. The finding will enable scientists to devise more effective control steps against the disease.

While some animals use colors, chemicals, chants, dances, and displays of light to entice mates, others, particularly certain fish, literally "turn on" their prospective sexual partners by using electrical cues. These electrical signals in fish are used for more than courtship, though. Some fish use electrical "songs" to communicate aggression, submissiveness, species recognition, and even for navigation, according to discoveries by a Cornell biologist.

Many fish shine an eerie blue light in the black deep of the seas, but some, unable to produce their own light, rely on bacteria that serve as living lanterns. An organism called Photobacterium fischeri, for example, lights up the sacs under the chins of Japanese pinecone fish.

Other types of bacteria illuminate areas on squids, tunicates, flashlight fish, and angler fish. The host fish use the beacons of light to attract prey, repel enemies, and communicate with one another. In exchange for the light, the fish provide free "room and board" for the bacteria.

Don't drive heavy equipment in wet fields

CHAMBERSBURG — Don't drive heavy equipment in fields that are wet. Soil compaction destroys soil structure and reduces crop yields, states John Akers, district conservationist with the Chambersburg office of the USDA Soil Conservation Service.

One Franklin County farmer reported a 20 percent reduction in corn yield on a field where he had spread manure during the winter over a field where he did not spread manure before.

Depending on the type of soil and

Fifteen years ago, most sport fish species in Lake Ontario were on the verge of extinction due to pollution, lamprey predation, and over-exploitation by commercial fishing. Today, the Great Lake is one of the nation's hot spots for sportsfishing. To bolster this industry, scientists from Cornell, the New York State Department of Environmental Conservation, and the U.S. Fish and Wildlife Service conducted one of the most comprehensive studies ever undertaken to estimate angler use, catch, and demographics in New York's water including Lake Ontario, Lake Erie, the Niagara River, and 25 tributaries. Management recommendations will be made this year.

Even though black and poor children are overrepresented in the lower tracks in schools, this overrepresentation is not a result of teacher bias, according to four studies conducted by Cornell educators. Results showed that the ability of the children consistently correlated with academic grouping rather than with parental socioeconomic status or race.

Also in the field of education, it was found that the timing of a student's absence can have a greater effect on his or her learning than how often that student is absent from school.

In the nutrition field, it was found that eating one major meal a day, rather than several smaller ones, may play a role in promoting certain kinds of cancer, particularly cancer of the colon. A Cornell nutritional biochemist also linked low-protein diets with cancer of the colon while the same diet may protect against cancer of the liver.

The more spouses talk to each other as individuals and not as they do to other people of the opposite sex, the more successful the marriage is likely to be, according to a Cornell study on communication theory. One of the most important factors influencing the quality of marital relationships, though, is the ability of spouses to adapt to each other, their relationships, and evolving domestic contingencies.

For generations, tens of thousands of Canada geese have used the so-called Atlantic flyway to migrate annually between Canada and the Carolinas. For reasons not well understood, the geese now migrate shorter distances and winter north of the Carolinas. To find out why, a Cornell wildlife biologist and scientists from eight eastern states are studying the migratory pattern of these birds by marking more than 30,000 Canada geese with yellow neck collars and leg bands. Bird watchers and hunters are urged to report their sightings. During 1984, more than 2,000 sightings were reported from as far away as Quebec and Ontario.

tillage done to the soil, it may take up to seven years for nature to return the soil to its uncompacted condition. Also letting crop residues or planting cover crops help to add organic matter to the soil and improve soil structure to minimize the problem of soil compaction.

Anyone desiring information about soil management techniques to minimize soil compaction should contact the SCS office at 550 Cleveland Avenue, Chambersburg, phone 264-7013.

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