

MINNESOTA *Science*

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Research Helps Manage Alzheimer's Stress



Alzheimer's disease affects three million Americans and their families. Family social science research has identified ways to lessen the stress on caregivers.

“Quality of life.” The phrase is frequently used in talking about things that make life pleasant, but we seldom hear it in talk about situations that involve impending death.

Yet, improving the quality of life for families that have a member with Alzheimer's disease is the goal of a five-year study being conducted by University of Minnesota family social scientist Pauline Boss and mental health professionals with the Minneapolis Veterans Administration Medical Center.

More than three million Americans in their mid-40s and older have Alzheimer's, an irreversible form of dementia. The disease causes drastic personality changes, progressive memory loss, and reduced intellectual capability. In later stages, people with Alzheimer's require constant supervision, putting great stress on caregivers.

People with advanced Alzheimer's are physically present but psychologically absent. This phenomenon (or its reverse), called “boundary ambiguity,” occurs when there's an unclear loss in a family, says Boss. With Alzheimer's, family members do not know whether that person is in or out of the family system. He or she can no longer relate to them in old, familiar ways.

Additional stress comes because only an autopsy can conclusively prove Alzheimer's presence. In early stages, only the spouse may see symptoms of the disease; others may doubt that anything is amiss. Later, a son or daughter may deny the disease's existence, stay away, or otherwise cease to be a source of support and comfort to the caregiver or the patient. Stress in the family increases as family members fail to support each other. The family becomes unable to deal with the situa-

tion cohesively.

Boss' work extends earlier research she did for the Minnesota Agricultural Experiment Station. Funded by the National Institute on Aging, it examines, through videotaped interviews, ways in which family members interact as they are confronted with the fact that one of their family probably has Alzheimer's.

“When there's a catastrophic illness, the entire family suffers,” Boss says. “We're interviewing family members, gathered together in the home, during the first five years after the VA doctors confirm that a patient probably has Alzheimer's.”

“We videotape the interviews as the disease progresses, to record how family members interact as they attempt to deal with the ambiguity, the confusion as to whether the victim is in or out of the family system. You have to know what the components of any system are before you can organize that system to survive, and the same is true of families.”

The study's conclusions include:

- Caregivers may neglect their own physical and mental health. Yet respite care, which gives caregivers a break from the routine, is vital.

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Female Runners Risk Iron Run Down

Women runners may be running into trouble, nutritionally speaking. A recent study indicates female marathon runners may be running their iron stores down to dangerous levels on their way to the finish line.

That's a major conclusion of experiment station researcher Joanne Slavin and research assistant Johanna Lampe. They studied a group of women runners in last year's Twin Cities Marathon, for six months, from beginning training, through the race.

Long distance running places serious nutritional stresses on women athletes, and their diet may not supply them with enough iron. Exercise also speeds the intestinal transit rate, which reduces the time their bodies have to absorb iron from food. In extremes, the speedup causes diarrhea.

Ironically, a sport that requires endurance above all may be exhausting the body's iron—a mineral needed for endurance. In extreme cases, low iron stores cause anemia and force some athletes to stop competing altogether.

Iron allows hemoglobin to carry oxygen to cells. It takes time to recover from iron depletion.

Runners lose iron partly through increased, unnoticed blood loss. "People that go for long, fast runs seem to lose a lot of blood through the feces," she says. Runners and joggers may damage

"A lot of the women we studied had no iron stores at all."



How does competitive or recreational long distance running affect the iron stores in women? Experiment Station nutritionists are investigating the dietary implications for women.

of the runners are not very good to begin with. "Some distance runners follow low-calorie diets. Achieving an adequate iron intake on a diet of 100 to 1200 calories a day is extremely difficult without additional mineral supplementation. A lot of the women we studied had no iron stores at all," Slavin says.

"Our runners didn't have classic eating disorders such as anorexia, but they tended towards some weird food practices, for example, avoiding a par-

time, but also binds minerals so they can't be absorbed. So probably some of these athletes are going overboard on fiber, and that's making the problem worse," she says.

Of the two forms of dietary iron, the body absorbs "heme" iron, from red meat, two and a half times better than "non-heme" iron from plant sources. Slavin says they found that "women who ate a little red meat had better iron stores."

Changed Soybean Ration Could Benefit Poultry Producers

While neither egg laying hens nor their brethren might care whether they get a change in diet, producers would. They would welcome the 25 percent increase in usable calories that will be provided if a new way of processing soybeans is adapted by suppliers.

The new processing method, says Craig Coon, poultry researcher with the University of Minnesota Agricultural Experiment Station, involves removing soluble carbohydrates called oligosaccharides from the soybean. The processing does not seem to have any negative effects. "Chickens are responding well to the soybean meal," says Coon.

"Removing these carbohydrates means getting more nutritional value from the soybean because it may remain in the chickens' intestinal tract longer, allowing better use of all nutrients," according to Coon. This increases the energy content the bean provides by about 25 percent. Eggs are produced at lower cost.

On the laboratory scale of this research, the oligosaccharides are being chemically removed with alcohol. But, Coon and research associate Mel Hamre believe the process could eventually be duplicated by a commercial processor on a large scale, or the same results achieved through genetic manipulation techniques.

Removing oligosaccharides is cost effective for producers because it means fewer nutrients will need to be obtained from another potentially more expensive source. "If the nutrients that can be recovered in this process had to be added to the soybean meal, it would cost approximately \$50 per ton of meal."

red blood cells circulating through capillaries in their feet. They also tend to use a lot of aspirin for pain, which might cause gastrointestinal bleeding, Slavin says.

Slavin also found that diets of many

ular food group, or taking huge doses of unneeded supplements," she says.

But Slavin found that some runners who were ingesting the recommended levels of iron still had inadequate iron stores. A high fiber diet may be aggravating the problem, she suspects. "Fiber not only speeds intestinal transit

Slavin is now looking at iron stores of recreational athletes. "Even these women seem to have problems, and I think most of it is due to their eating patterns," she says. Research like this will help women athletes make the right nutritional choices to stay in stride.

—Jennifer Obst

approximately \$52 per ton of meat, says Coon.

When the soybeans can be marketed this way, it will mean increased value of Minnesota soybeans to poultry producers.

—Mary Kay O'Hearn

Here's the Next Generation of Nitrogen Management

A nitrogen management plan refined by a computerized expert system that gives crops exactly what they need—and no more. That's what University of Minnesota researchers are working on.

Their goal: optimum yields, restored profitability to agriculture and improved ground water quality. "Our research represents the 'next generation' of nitrogen management," says Gary Malzer, soils researcher with the Agricultural Experiment Station.

Malzer's research focuses on the irrigated Sand Plain of central Minnesota. The computerized expert system monitors crop needs and in unusual years, it adjusts nitrogen rates during the growing season.

"Last year was dry in the Sand Plains growing area so there was little nitrogen leaching during the growing season. But let's say we have four inches of rain in late June. The expert system predicts what took place in the soil and recommends adjusted nitrogen rates.

"The system makes sure there's enough nitrogen for the crop, but not so much that excess nitrogen is left in the soil at the end of the growing year," Malzer says. "It also helps keep nitrogen from getting in the ground water before crops can use it."

—Jack Sperbeck

Immunity in Chicken and Turkeys Boosted by Research

Viruses are the worst kind of enemy—hard to spot and quick to spread. They cannibalize living cells in people and animals, using the cell to reproduce, and then spread. In a closed environment such as the kind chickens and turkeys are reared in, they can be particularly dangerous once introduced.

University of Minnesota veterinary pathobiologist John Newman has been working on giving the birds an even shot at fighting off a viral invasion. He's looking for the best immunization system, and ways to augment the passive immunity that is a gift from the mother hen to every egg.

Newman's specialty is avian respiratory diseases. In the United States losses from disease and management related problems and lowered production efficiencies cost the turkey industry about \$320 million per year. "Respiratory diseases are the number one economic burden to the domestic poultry industry," Newman says. It and immune system complications account for about 50 percent of the deaths in young turkeys.

Low winter humidity is hard on the respiratory system, and also aids in creating dust, which is an additional irritant. Respiratory diseases are a very complex interaction of the environment, the host, and the infectious agent, according to Newman.

Some of these viruses are more



Respiratory diseases are a constant threat to turkeys and chickens. Veterinary medicine pathobiology research is evaluating the effectiveness of immunization programs.

pathogenic than others. After the 1974 North American outbreak of the virulent Newcastle disease, \$54 million was spent to eliminate it from the continent. But respiratory diseases do not have to be fatal to be a problem to the industry. Less virulent viruses weaken resistance to secondary microorganisms. As a

result, "the birds don't eat quite as much, may not be as active; so these subclinical infections reduce production efficiency," Newman says.

There can be other complications. A milder form of Newcastle disease affects egg production. "Not only does it create a significant drop in the number of eggs, but the eggs that are laid have poor shell quality, which means the chances of those eggs hatching are not very good. So it's very devastating to a turkey breeder if the flock gets infected with Newcastle disease. In the market flocks it can be devastating because of the effect on the respiratory system," he says.

Newman has been evaluating various immunization programs for Newcastle disease. "We've looked primarily at optimum timing for vaccinating market turkeys. It turns out that the growing turkey should be vaccinated at least twice," he says.

This is because of the role of parental, or passive immunity. "Antibodies are found in the egg yolk which the young poults absorb. These antibodies last about three weeks. While these antibodies are helpful in protecting the young poults, they hinder the immunization process because, of course, the vaccine is actually a modified form of the actual disease-producing virus. And so when you vaccinate in the presence of passive immunity, the viruses neutralize these antibodies," Newman explains.

Timing the vaccination is critical. The first immunization is done at about

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Farm Families: Growth, Change in Crisis

A study of families who have gone through farm credit mediation has looked at the impact high economic stress has on the farm family. Preliminary results show that the economic stress pulls most families together, but it also tears some families apart.

The Minnesota Agricultural Experiment Station study is of family economic, social and emotional adjustment strategies, says Sharon M. Danes, family resource management extension specialist. She and colleagues Jean Bauer and Kathy Rettig, have been studying 592 people who have completed mediation.

The study has shown some revealing changes. "A lot of the farm families no longer trust financial institutions or other people. They feel a way of life they knew and loved has been destroyed and they're resenting it," Danes says.



New Test Tells When One Cow Can Infect Another

This is the kind of virus that gives viruses a bad name. This is a virus that stays hidden, but lowers resistance to other infections. This is bovine leukemia virus, and it infects 20 percent of United States dairy cattle.

Alvin Weber is a station veterinary biologist who has been aiming at this moving viral target for over 25 years, trying to keep it at bay. He studied the infection in many cattle, and developed a lab test that may help predict in which animals the virus is likely to become most dangerous.

Bovine leukemia costs the United States over \$44 million annually, for replacement of diseased cattle, lost milk production and associated costs. But the true costs may be even larger. "That figure doesn't take into account the other diseases, the pneumonia, the mastitis, that cause losses because the bovine leukemia virus has lowered animals' resistance to other diseases," Weber says.

Bovine leukemia virus was first identified in 1897 in Europe. It spread rapidly after the first World War, when immigrants and refugees leaving eastern Europe took infected cattle with them.

By the 1950s several European countries launched test and slaughter programs to eliminate the disease. But the United States never has, though the disease can sometimes be devastating. "We'll find herds that test 70 to 80 percent positive for the virus," Weber says.

Weber has determined that insects like the stable fly are probably not a virus carrier. With experiment station entomologists he is now looking at mosquitoes which might carry blood from one animal to another while feeding. The virus, like AIDS, "seems to be carried with the passage of blood from one



Veterinary biologist Alvin Weber has developed a laboratory test to identify the most infectious carriers of bovine leukemia virus.

Weber's laboratory test helps determine which infected animals are likely to be infectious. "The infectious animals are the ones whose cells will produce the virus in culture. Those which can't would probably be less infectious. For if you have, for example, 2500 cells, and one of those cells will produce virus, how can those cells hurt any other animal? But if maybe 30 to 40 percent of them will produce virus, that animal can infect another animal," Weber explains. "We find that cells from some infected animals will not produce any virus in culture, and they'll stay that way for a good long time,"

1984, almost 77 percent of the Angus but only 26 percent of the Charolais cattle were found to be infected.

Weber and experiment station animal scientist Jay Meiske are now using the "in vitro viral expression test" as a criterion to identify cattle to be segregated or culled in the University beef herd. The test has shown that 36 percent of the herd testing positive for the virus tested zero for "virus expression" (i.e., infectiousness) for two years. "Now we are following this herd to see if they will stay high, or low or zero in virus expression year after year."

One key to this virus seems to be



"Some of the families have become more politically aware, not in terms of bipartisanship, but in terms of farm policies. They have a broader perspective beyond their own situation. That some of these people could gain this perspective as they were or are losing their lands is amazing to me," she says.

"We found cases where wives or husbands were very bitter because their spouse had heart attacks and died. But then we also heard a lot of positive things," she says. "Most respondents

Families *continued on back page*

Marketplace is "Taming" the Wild Mushrooms

Edible mushrooms, once only gathered in the wild, are now farm produced. Commanding space in local markets are exotic mushrooms such as shiitake, oyster and enoki, says Shirley Thenen, food scientist with the University of Minnesota Agricultural Experiment Station.

"Mushrooms are high in protein, B vitamins and essential minerals, but quite low in calories if you don't cook them in butter," she says. Their high potassium content can also be good for persons taking diuretic drugs for high blood pressure.

Farm communities with an abundance of hay, straw and corn cobs might be interested in mushroom cultivation as an alternative crop, she says.

As one part of her nutrition studies, Thenen plans to use whey as a misting agent in laboratory cultivation of commercial edible mushrooms. She wants to see if the nutritional values of these mushrooms can be increased.

—Mary Kay O'Hearn

animal to another. A drop of blood the size of a pinhead is enough," he says.

Problems in dealing with the virus are that cattle can be infected and show no signs of disease, and that not all infected cattle are actually contagious.

What strategies deal with bovine leukemia? "We've been trying to find ways to identify and either segregate or get rid of animals that might be infectious," Weber says. Infectious animals could be kept separated, or treated last for procedures that could allow the transfer of minute amounts of blood, such as vaccinating, dehorning or tattooing.

"Having this darn stuff parked in the wrong place louses up the immunologic capability..."

Weber suspects a genetic connection to disease resistance. In a University beef herd of 304 cattle in which six died of lymphosarcoma between 1980 and

how it integrates itself into the chromosomes of infected animals. "If it intercalates itself into the animal's chromosomes where the immunologic functions are—the effect is just like trying to sing with a bad singer next to you. So, having this darn stuff parked in the wrong place louses up the immunologic capability of the lymphocyte," Weber says.

However it expresses itself, the more that is known about this elusive and deadly virus, the better beef producers and dairy farmers can hope to manage in holding or fending it off.

—Jennifer Obst

Water Quality Center Enters Second Year of Field Research

Now in its second year of field research, The Center for Agricultural Impacts on Water Quality at the University of Minnesota hopes to be able to develop recommendations, for agricultural practices to protect water quality, sooner than expected.

"To be really statistically sure, you probably need three to five years of research, says center director and soil

scientist Jim Anderson. "But if our results are consistent from fall through winter, into spring and summer, we'll be fairly confident in saying some things sooner about management strategies."

The center does most of its field research on soils considered most vulnerable to ground water pollution. Coarse textured soils are being investigated at a Westport site in Pope

County. Silt loam over limestone bedrock sites are being examined in southeastern Minnesota's Goodhue, Winona, and Olmsted counties.

Westport, a former USDA research site, has a documented soil management history, and expensive research facilities already in place. Anderson says duplicating that site today would cost as much as the entire center budget, if it were even possible.

The center operates on a budget of about \$250,000, from the Minnesota Agricultural Experiment Station. The Legislative Commission on Minnesota Resources has provided a two-year grant of \$150,000 per year. The center is collecting data on nitrogen movement and agricultural practices, pesticide pollution, ground water flow, and economic impacts.

"Lysimeter" research at Westport lets experiment station soil scientists Gary Malzer and Gyles Randall accurately measure the nitrogen that passes through the soil to the ground water. There are 30 five-foot wide, four-foot deep stainless steel lysimeters buried in the earth. They let the researchers measure exactly how much of a



Watsonwan County Extension Agent Gary Wyatt (left) discusses the potential for nitrate leeching from feedlot manure with Layne Evers of St. James, Minnesota.

Water Quality *continued on p. 4*

Sustainable Agriculture Research Group Named

Think about agriculture. Visualize huge tractors, plowing deep furrows across fields. Think of the cost of food at the supermarket. Consider small family farms.

Whatever your image of agriculture, concern is growing that some farming practices create profit at the expense of our environment. The University of Minnesota is dealing with the issue through a recently established interdisciplinary working group on sustainable agriculture, headed by experiment station agronomist Kent Crookston.

Sustainable agriculture covers many definitions, ranging from total elimination of chemical inputs and single-crop farming, to simply reducing the use of chemicals and fuels made from non-renewable resources.

Experiment station research focuses on reducing inputs, not totally eliminating them. University of Minnesota plant pathologist Philip Larsen notes that we don't currently have the knowledge and tools to completely eliminate chemicals and yet deliver the unblemished produce consumers want.

Experiment station researcher David Andow says some elements are common to most definitions of sustainable agriculture. It's a long-term approach, "systemic" in viewing agriculture's impact beyond the individual farms, and critical of commercial farming practices.

The differences loom larger, however. And, importantly, how do we reconcile conflicting concerns for profitability, environmental protection and maintenance of rural communities? C. Eugene Allen, acting vice president for the University's Institute of Agriculture, Forestry and Home Economics, says, "Some of the station's research activities are already relevant

initiated."

Experiment station research generally seeks to eliminate or more efficiently use chemicals and mechanical inputs, while maintaining or improving profitability, according to Crookston.

The research looks for resource-conserving techniques, beneficial inter-related cropping and livestock production systems, and a theoretical understanding of the effects of interactions and change.

Allen says such research would help change the more-is-better attitude of producers who use higher-than-optimal levels of expensive inputs, risking both profitability and soil and water resources.

It would include current research such as overwintering corn in the field to dry, and on crop interplanting to take

advantage of beneficial combinations. It would expand current research into biological weed and insect controls such as companion plantings, crop rotations, beneficial predator insect releases, tillage interactions and mulches.

Current research on computerized soil-specific chemical applicators, chemical-stretching additives, alternative crops, weed-competitive and disease-resistant crops, disease-suppressive soil microbes and multiple-use plantings would all continue to be relevant.

And, Allen says, it would certainly call for new research that compares the effects on both profitability and the environment of a wide variety of alternative methodologies for reducing or eliminating purchased inputs.

—Larry A. Etkin



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three weeks, after the passive immunity has declined, but before the young birds have a chance to be infected. And that immunity lasts about four to six weeks. So we recommend that the turkey poults in high risk areas be re-vaccinated at about six weeks," Newman says. The vaccine is administered as an aerosol or in drinking water.

Newman is also working on improving the birds' immune system in another way. "We try to provide a uniform high degree of antibodies in both chicken and turkey breeders, so that the poults that are hatched from those eggs have a more uniform level of antibodies. If we could develop a precocious immune system, those birds would not only be able to respond better to the vaccine, but also resist various microorganisms."

"So we are working with the breeders on a vaccination program that will produce a high and uniform level of immunity in the mother to pass on to her eggs." They use an inactivated,

"Respiratory diseases are the number one economic burden to the poultry industry."

timed-release vaccine, he says.

The ultimate solution to avian respiratory disease problems would be to get rid of them altogether. Newman says, "eliminating avian respiratory diseases would be very difficult. Part of the problem is that migratory waterfowl are an excellent reservoir for Newcastle disease and avian influenza virus, and

others may need redirection to include elements that address those concerns. And, some new research will need to be

Water Quality *continued from p. 2*

chemical passes through the soil unused.

Acre-size plots, where actual wells have been drilled, measure nitrates and additives reaching ground water under a variety of tillage and soil management treatments.

And more than 100 small plots test differing combinations of chemicals, crop rotations, tillage practices and irrigation use. "This should tell us what we can do to minimize the impacts of agricultural practices on ground water, how to time applications of nutrients and pesticides, how much to use and adjustments to accommodate different crops, rotations and tillage," says Anderson.

The center also assists local projects in a number of counties. One of those is a farm well-monitoring program in Faribault, Martin and Watonwan. "Local involvement is important to us. It ties into an increased interest and awareness by people that they should be concerned about the quality of their water. It was the people there that took the initiative," says Anderson.

"Duplicating that site today would cost as much as the entire center budget."

"We try to work with the people from particular areas that have concerns, to help set our research priorities," he said.

—Larry A. Etkin



Sustainable agriculture can involve a variety of approaches, two of which can be seen here: rotating crops, as with these soybeans on fields previously planted with corn, and no-till planting which leaves crop debris for mulch and reduces erosion.

they keep bringing the viruses back. We try to minimize the stress, and maximize the quality of the environment, so that if the agent is introduced, the bird has the resources to fight it off."

—Jennifer Obst

Potato Research Finds Clue to Dark Chips

When you think of potato chips you probably think of "plain or rippled" or perhaps onion or herb dip to eat them with.

But to Minnesota potato farmers, processors, and snack food distributors, potato chips are more than just a snack food that goes great with dip; they are an important economic product. Over two hundred and fifty million pounds of last year's Minnesota potato crop were processed into potato chips.

In recent research, University of Minnesota Agricultural Experiment Station plant pathologist Ernest Banttari, cooperating with Paul Orr of the USD Potato Research Laboratory in East Grand Forks, Minnesota, showed that an old disease of potato is responsible for some new problems in the chip industry. They linked chip discoloration to a disease organism known as purple top.

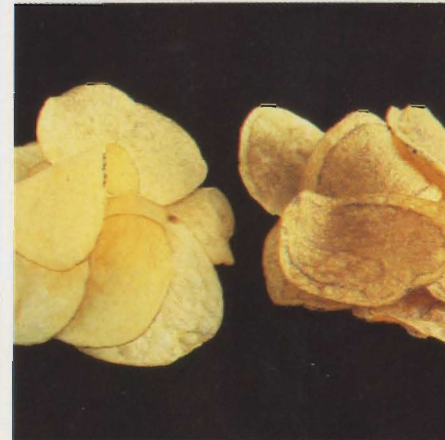
Purple top, which is descriptive of the disease in some potato plants, is caused by an organism known as aster yellows mycoplasma which can infect over 300 plant species. Potato chipping cultivars such as Monona and Norchip are quite susceptible.

The disease can cause a variety of symptoms in different cultivars. These can include the "purple top" foliage discoloration, or some cultivars may develop yellowed and curled leaves, stunted growth, and occasionally inedible "aerial tubers."

The last severe outbreak of purple top was in 1981, although there is no good estimate on how much damage it did. "No firm estimate exists of the

amount of loss from that outbreak because no surveys were made," Banttari says. "There were numerous questions concerning dark chips in the 1981-1982 processing season. At that time we did not have the answer."

Now we know the problem is associated with infestations of potato



Darkened chips (right) due to purple top infection of tubers. On the left, chips from healthy tubers.

fields with aster leafhopper, an insect that can't overwinter in Minnesota, but is often carried in from southern states on strong winds. "A low percentage of the leafhopper may actually carry the mycoplasma but there can be enormous numbers—millions, billions of insects," Banttari explains. "Therefore, you don't need a high percentage of infective leafhoppers to cause problems."

Purple top can infect many cultivars, but Banttari and Orr focus on its effects on those normally grown for chipping. Infected tubers appear normal at harvest.

The problem shows up after the potato has been processed and fried.

The disease causes an abnormal conversion of starches to "reducing sugars" which caramelize during frying. The result is a severe darkening and discoloration, which affects the appearance and taste of finished potato chips. (Brown spots occasionally found on potato chips might or might not be the result of this plant mycoplasma. Discoloration of chips can also result from other common causes, such as when potato tubers are bruised or overchilled.)

Banttari is developing an assay, to detect aster yellows mycoplasma in leafhoppers, that can be completed fast enough to alert growers to potential control of leafhopper infestation by applying an insecticide. "At present, the only control measure possible is to control the insect," Banttari says. The current method of detection involves exposing healthy indicator plants to insects suspected to be infected, and then observing the plants for weeks to see if symptoms develop.

Banttari is working on a simple, accurate and quick seriological assay that should return results within a day or two. This diagnostic test could not only be used on plants, but also to screen out heavily infected lots of potatoes before they are placed in storage. He says this would be a great help because "we have some evidence that chip discoloration intensifies when storage of infected tubers is longer."

—Larry A. Etkin

Farm Families *continued from p. 3*

said their families became more important and moved closer together during the stressful times. They talked about enjoying the family activities more. They mentioned the help they received in money and services from both the immediate and extended family members.

"The economic situation forced couples to set goals and clarify priorities. And an important positive outcome of the stress was improvement in money management practices. Respondents said they now had more knowledge of laws, banking services, investment alternatives and community resources. They keep better records, have improved business practices and have become more effective consumers," Danes says.

The researchers also received many letters from families in the study. "We were surprised by the amount of appreciation we got from people, that they felt they could express their feelings and experiences, because they didn't always feel they could do it with neighbors or other community members."

The study is continuing for a second year, looking at family adjustment strategies, and the recovery process.

—Jennifer Obst



Verne Comstock explains flax research at a West Central Experiment Station (Morris) field day.

Verne Flax Now on Recommended List

The University of Minnesota's crop variety review committee has added Verne flax to the list of those recommended for Minnesota.

Verne, released by the Minnesota Agricultural Experiment Station last spring, is named for Verne Comstock, a retired USDA plant breeder who conducted a flax breeding program at the University for many years. Verne was the last variety that Comstock developed.

Agricultural Experiment Station agronomist Ervin Oelke said that Verne is notable for its high yield, particularly when sown late. It is an early-maturing variety with good resistance to breaking or falling over. In 25 trials at seven Minnesota locations over the past several years, Verne yielded an average of 20.8 bushels per acre, compared to 20.7 bushels for Dufferin and Rehab, the other two flax varieties that are recommended for Minnesota.

—Sam Brungardt

Alzheimer's *continued from p. 1*

- Generally, male caregivers are more likely to use respite care without feeling guilt.
- Although the government urges families to keep Alzheimer's patients at home and many families are reluctant to institutionalize one of their own, the stress of caring for Alzheimer patients at home is more than some families can stand.
- If family members accept the Alzheimer's and deal with the situation openly, both the patient and the caregiver get more support, experience less stress and fare better.
- The kind of support a caregiver needs varies. Some find support groups helpful; others may only want the facts about the disease, and its implications, to help make the necessary decisions.
- The role the patient played in the family affects how a family deals with the situation. For example, if the patient was the one on whom a family tradition depended, the family may feel a severe loss when he or she can no longer fill that role. The family's cultural background is also important. For example, a native American family may hesitate to "usurp" the elder's role, even if that person can no longer make decisions because of Alzheimer's.

A videotape simulation of a family struggling with Alzheimer's has already resulted from the research. It shows how behaviors of family members can increase or reduce stress. Cassettes of the videotape, "The Family and Alzheimer's Disease: The Case of Ambiguous Loss," may be rented through county extension offices or from the University of Minnesota Extension Service Distribution Center, 612/625-8173.

—Sam Brungardt

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