UNIVERSITY OF WYOMING

The Extension Connection

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Summer 1998

A great success for Wyoming Cooperative Extension Service

The Wyoming Extension Showcase on Technology (WEST) was a regional multi-state exposition and educational program, showcasing cutting-edge technology from all aspects of society. The show was held at the Casper Events Center in Casper, Wyoming, February 20-21, 1998.

The concept of the WEST began with an internal Extension program review in Weston County, where several clients on the agriculture committee expressed the need for greater technology transfer to county residents. WEST targeted the citizens of Wyoming and surrounding western states with exhibits and programs designed to reach everyone—youth, young adults, families, and homemakers; large, medium, small, and home-based business owners; academicians, community college instructors, school teachers, and other educators; engineers; farmers and ranchers; librarians; elected officials; individuals and businesses involved in development and application of technology; and recreational enthusiasts.

The WEST offered something for everyone. People of all ages were offered an opportunity to experience new technologies first-hand.

Representatives from nine different states were present, comprising 82 separate exhibitors and filling approximately 150 booth spaces. Corporations including Caterpillar and Norwest Banking made appearances as well as local internet service providers, clothing manufacturers, construction companies, government, state, and environmental agencies, and more. Many presenters provided the general public hands-on experience and new technology demonstrations. One of the more unique and exciting parts of the WEST was the number, depth, and variety of technological presentations held in five separate meeting rooms throughout the event, totaling 46 hours of educational programming.

Governor Jim Geringer welcomes WEST exhibitors and participants to the first annual event, an integrated effort between UW and the state designed to share the technolgies of today with the people of Wyoming.

The show could not have been accomplished without the help and support of a number of sponsors who believed in the concept. The sponsorship committee established a multi-tiered sponsorship program for the event. In addition, nearly 50 CES employees were involved with various aspects of the project. Many other UW employees, friends and advisors of CES, participated, and the committee-of-the-whole mailing list eventually numbered over 60 people.

Many outcomes from the exhibition are still coming to light. Two of the most notable were letters from Governor Jim Geringer and UW President Phil Dubois thanking CES for the opportunity to be involved in the event. Computer kiosks were used

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New rocket technology based in Wyoming

Wickman Spacecraft and Propulsion Company is currently under contract with NASA to develop a rocket engine for returning Martian soil to Earth.

Wickman Spacecraft & Propulsion Company of Casper, Wyoming, has pioneered the fields of phase stabilized ammonium nitrate oxidizers, rocket propellants from processed lunar soil, hydrocarbon liquid oxygen monopropellants, and now rocket and jet engines using carbon dioxide as the oxidizer.

At the WEST, Wickman Spacecraft & Propulsion showcased many past projects, amateur rockets from CP technologies, and its current NASA project. Under contract to the NASA Jet Propulsion Laboratory, the company is developing a rocket engine for returning 125 grams of Martian soil to Earth. A Martian jet engine (currently being tested) will enable future unmanned rovers to fly jet-like aircraft to different landing sites on Mars. On Saturday, John Wickman, president of the company, had a half-scale remote-controlled Mars rover driving around the exhibitor's area. "That was a big hit with both kids and adults," he said. "Many people were surprised by our existence in Wyoming and very pleased that these sorts of technologies are being developed here."

Wickman Spacecraft & Propulsion Company is celebrating its seventeenth year in business. Founded in 1981 by John Wickman, its initial mission was consulting on various research and development projects. In 1986, the founder joined forces with Dr. Adolf Oberth and moved the company into research and development. The company also supported Thiokol and United Technologies Corporation on the post-Challenger solid rocket booster field and nozzle joint redesign and Titan recovery programs, respectively.

In 1990, the mission of the company was expanded to include manufacturing. In 1993, the company moved from Sacramento, California, to Casper. "We needed a larger facility for a new NASA contract project, Wickman said. "We were developing a new liquid rocket engine with 16,000 pounds of thrust for a sounding rocket. It was too

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Biobarrier® systems provide long-term protection

Harry Barnes, left, explains the new Biobarrier® root control system.

Reemay, Inc., out of Old Hickory, Tennessee, showcased its new Biobarrier® root control and Biobarrier® II pre-emergence weed control systems at the WEST. Both products are made from a flexible, permeable geotextile fabric covered with small nodules containing the herbicide trifluralin. When strategically placed in the soil, the fabric/herbicide combination prevents root encroachment for at least 15 years while allowing water, air, and nutrients to pass through, maintaining soil hydrology.

The root control system redirects tree roots away from the hardscape or area needing protection. Preemergence weed control systems prevent surface weed growth by inhibiting post-germination root tip growth above and below the geotextile fabric. As micro-organisms in the soil continually break down the herbicide, the amount maintained in the soil is the minimum concentration necessary to prevent root tip cell division. Other parts of the plant remain unaffected.

Trifluralin has been successfully used for more than 30 years. Biobarrier® uses a long-term, controlled release technology to dispense small amounts of the herbicide as a vapor. Trifluralin does not leach in water.

"We hadn't done a lot of product marketing in Wyoming before the WEST," said Harry Barnes, Biobarrier® manager. "The interest level was very high and people saw many potential applications. It was definitely a worthwhile experience, and we'll certainly look at doing it again."

Germbusters: An interactive hand-washing display

> *Teaching children the importance of hand washing will help develop good habits at an earlier age, therefore reducing their chances of getting sick.*
>
> – Debbie Popp

What's 8 feet high, built with PVC pipe and black plastic? The Germbusters black tunnel – an interactive hand-washing display that had its debut at the WEST last February. More than 800 adults and children were involved in the Germbusters demonstration during the two-day event.

For several years, University of Wyoming Cooperative Extension personnel Debbie Popp, food stamp nutrition education program coordinator; Darlene Christensen, family and consumer sciences educator in Crook County; and Bonnie Ellenwood, family and consumer sciences educator in Johnson County, have worked on spreading the hand-washing message. They first developed a hand-washing curriculum, then purchased two large UV lights and other materials for statewide demonstrations.

Over the years, the team's vision has grown. They recently decided to build a large, portable room where UV black lights would provide the only lighting. The "tunnel," designed and built by Popp, became a mock bathroom complete with running water, a sink, toilet, and towel rack.

The bathroom is an area of the house that harbors germs and bacteria, and the tunnel enables participants to visualize this. Contaminated areas are noted by instructors: simulated germs on hands, towels, doorknobs, and toilet handles.

A special glow-in-the-dark hand lotion shows what germs might look like if people could actually see them. After rubbing in the lotion, participants wash their hands as they normally would. Prior to this experience, many people have never used soap, and very little of the lotion will come off without it. Most individuals are astonished to discover their hand-washing skills are not adequate and germs are still present.

Instructors stress the importance of using both soap and hot water when washing hands, lathering for 20 seconds or just long enough to sing the ABCs. Participants then rewash their hands in hot, soapy water for 20 seconds. More than 90 percent will continue washing their hands until they no longer glow.

"Teaching children the importance of hand washing will help develop good habits at an earlier age, therefore reducing their chances of getting sick," said Popp.

Next on the Germbusters agenda is revising the tunnel design for easier setup and travel. It will be highlighted at the National Extension Association of Family and Consumer Sciences annual conference during the showcase of excellence. The team also will be designing a Germ-busters web page and incorporating a research project into the program.

For more information, please contact Popp at (307) 766-3878, Christensen at (307) 283-1192 or 1-800-516-2700, or Ellenwood at (307) 684-7522.

Debbie Popp, a member of the Germbusters team, discusses with WEST participants the importance of washing hands in hot, soapy water to remove germs.

EDR brings new technology home

Economic Development Resources (EDR) out of Evanston, Wyoming, demonstrated a new toilet flushing technology at the WEST. This water-saving device replaces the flushing mechanism in a standard toilet with a PowAir Flush unit, putting a small amount of water under pressure to deliver a powerful, air-assisted flush.

"Although we live in a desert, we have been surprised that many government and community leaders do not see the need to conserve water in the home, especially the 45 percent that goes right down the toilet," said Bob Fry, EDR project coordinator. "But at the WEST we found that the homeowner often understands the need to do his or her part in saving water."

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> – Bob Fry

Representatives from Economic Development Resources demonstrate their new water-saving toilet flushing mechanism. This device uses only 1.6 gallons of water per flush.

While using just 1.6 gallons of water per flush (gpf), this system completely cleans the bowl in one flush, eliminates silent leaks, is simple to install, and requires minimal maintenance. Over one-third of the residential water used in American homes is flushed down the toilet. PowAir Flush enables a family of four to save over 50,000 gallons of water per year.

Federal law now mandates 1.6 gpf in all new construction, and many types of low-flush toilets are available. However, gravity flow toilets often require multiple flushes, and replacing a functional toilet with a new one is expensive. The PowAir Flush is a cost-effective, environmentally friendly toilet upgrade and the only one of its kind on the market.

"If we can help the nation save water by replacing the insides of existing toilet tanks with our PowAir Flush device, it's a win-win deal for everyone," Fry said. "Homeowners will save money on their water bill; water districts will be processing less water and sewage; and communities will save tax dollars by being able to use current processing facilities as populations grow."

PowAir Flush is a simply designed, pressurizeable container that fits into many existing toilets to cost effectively transform a standard gravity toilet into a high performance, air-assisted, low-flow toilet. This technology was developed several years ago after a drought in California. The project later moved to Salt Lake City, Utah, and then to Evanston.

EDR is currently seeking product refinement for full commercialization. Limited production and field testing are conducted at EDR's facility in Evanston, and research and development work is handled in Utah. PowAir Flush will initially be marketed in bulk to major municipalities with high water rates.

"If our product had been ready to sell, we think we could have sold over 100 units at the WEST," said Fry. "The showcase provided us the opportunity to test community recognition of the precious commodity of water. And in addition to the public, we were surprised at how helpful the other exhibitors were with networking opportunities. We made several key contacts that have already proven beneficial."

WEST

WEST

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to collect information on attendee perception of the event with prizes given away randomly to those who completed the survey. Attendees appreciated the diversity of the presenters, with computer-related exhibits and presentations receiving top rankings. One member of the WEST team noted, "It was certainly an audience far different than any I recall at other extension-led educational functions. I do not remember seeing so many families together at any non-4-H event."

As yet, all the implications of the WEST are unclear. However, there is strong demand on the part of sponsors, exhibitors, and presenters to hold a similar event in the near future. Perhaps CES has found a new niche in Wyoming society.

Modern technology controls noxious weeds

University of Wyoming CES Weed Specialist Tom Whitson has spent nearly 20 years in the field, documenting noxious weeds while searching for better methods of controlling them. His quest, a search for technological innovations to make weed management more efficient, may be partially satisfied by the development of a herbicide-applicator system, the Burch Wet Blade mower.

Using the proceeds from his best-selling book, *Weeds of the West*, Whitson recently purchased the state-of-the-art mower for university research and displayed it at the WEST.

Powered by a John Deere tractor, the large circular mower deposits a lethal dose of herbicide when each plant is cut. The large extension-arm cuts through brush as well, which has traditionally been difficult to manage. "I see this new system as a breakthrough in technology that will allow Wyoming residents to manage unwanted weed species, such as rubber rabbitbrush, that have not been controlled before," said Whitson.

Tom Whitson, UW CES weed specialist, relates the benefits of his new, state-of-the-art Burch Wet Blade mower to a WEST attendee.

A computer placed under the shade canopy regulates the flow of herbicide, allowing the operator to use only the desired amount. Approximately 2.5 gallons per acre of diluted herbicide can be used, compared to conventional spraying that uses between 20 and 100 gallons per acre. No chemicals are mixed at the site, and only plant parts cut by the mower receive an application of herbicide. Excess chemicals do not run off into the soil, making this system both environmentally friendly and cost efficient.

Whitson is planning summer field trials to test this new equipment against noxious weeds and resprouting bush species such as spotted knapweed, leafy spurge, field bindweed, Canada thistle, musk thistle, rubber rabbitbrush, silver sagebrush, Russian-olive, and saltcedar.

The future seems promising for both large and small weed control. "This system will be especially effective in highway maintenance or wherever regular mowing occurs, including golf courses and even our own back yards," said Whitson.

Casper College: Pioneers in the field of assistive technology

WEST participants experienced virtual reality first-hand with "Mind Bowling," a game produced by The Other 90% and exhibited by Joe Schaffner, program director for assistive technology at Casper College, and his students.

The game is controlled by the galvonic skin response (GSR) to a person's thoughts. "The conductivity of the skin changes very rapidly to thought processes," said Schaffner. "The sensor picks up these changes and sends them to the computer via the serial port. The computer analyzes the signals and converts them to axis movement."

The monitor Schaffner used in the demonstration was a 42-inch Plasma display digital TV, the thirty-first one sold in the United States. According to Schaffner, Bill Gates bought the first 25 for his home and the NYSE bought the next five.

The Assistive Technology Degree Program teaches students ways to improve quality of life for people with disabilities. Assistive technology is used to adapt, create, and modify available technology for the physically and mentally disabled. In the lab, for example, students work on program

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Wickman

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expensive to buy that kind of facility in California, plus Sacramento was getting a lot of crime, and the California government was adopting an increasingly hostile anti-business attitude."

After looking at all 50 states, Wickman narrowed down his choices to Wyoming, Colorado, and Nevada. "After on-site investigations, I could see that Colorado was going down the same road as California, and it would only be a matter of time before it became a mini-California," he explained. "Nevada was unlivable except in Reno and Las Vegas, and in my opinion, those two cities are not the place to raise a family. So we chose Wyoming."

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Once settled in, Wickman formed a new Wyoming corporation, Totally Benign Enterprises, under which Wickman Spacecraft & Propulsion Company became a division. Another division was formed, CP Technologies, which sells rocketry-related products to universities and amateur rocketeers all over the world.

Wickman is currently negotiating with NASA on a cooperative agreement to develop a new low-cost sounding rocket. This new rocket will drop the launch costs of putting experimental payloads into space by a factor of 10. If an agreement is reached, a new, state-of-the-art sounding rocket will be launched early next year from White Sands, New Mexico.

Casper College

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ming electronic mats that people in wheelchairs can roll over to turn on various electrical devices. They also learn more complex technology, programming computers to make coffee or start a car. Schaffner uses Mind Bowling and 13 other games to show recreational uses of the computer to both students and people with disabilities.

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