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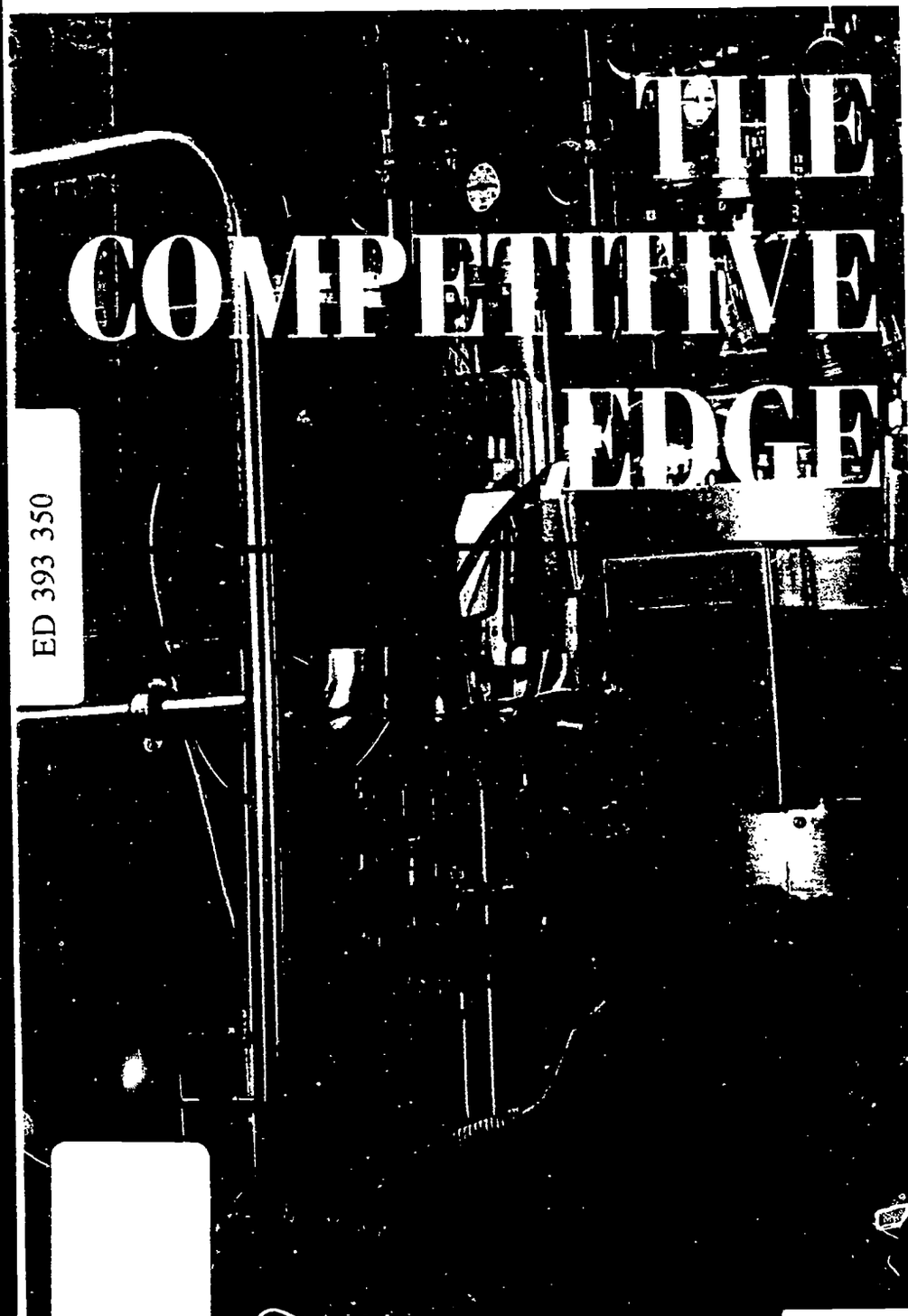
ABSTRACT

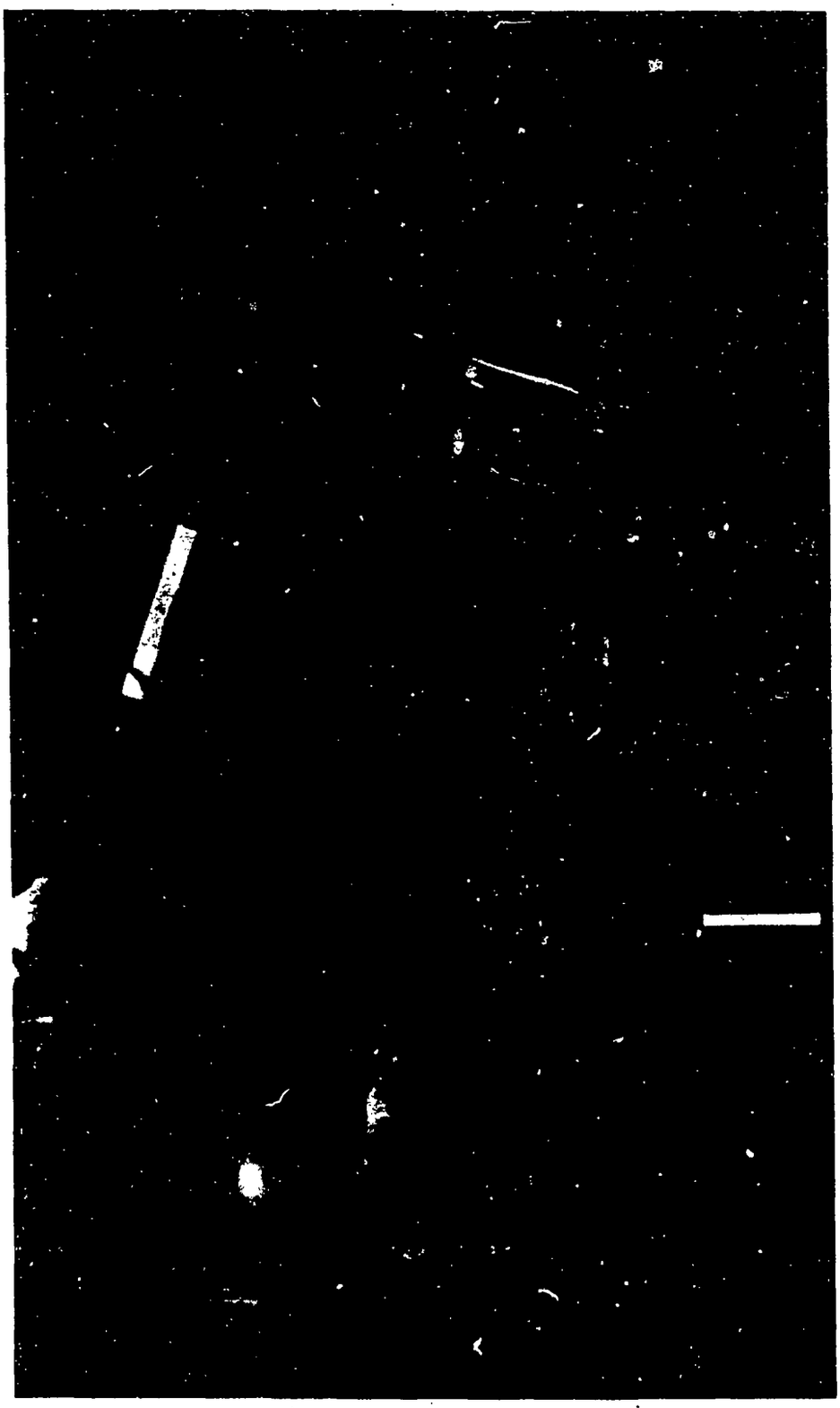
This publication describes industrial extension programs at five universities and argues for establishment of a national industrial extension network to help small and medium sized manufacturers meet the challenges of the current economic climate. A loss of competitive edge is ascribed to declining technical capabilities and productivity among manufacturers employing 500 or fewer workers. The solution proposed is a major expansion of federal, state, and local extension programs into a national industrial extension service network. This network would build on successful programs; make available access to technology, training, engineering, and management advice and expertise; promote cooperation among government, industry, research institutions, training centers, and management organizations; respond to local firms' needs; emphasize outreach; use federal funds to leverage monies from other sources; and avoid program duplication. The nation's public universities possess the combination of experience, capacity, and commitment that should enable them to play a leading role in the proposed network. The bulk of the publication contains 2-page descriptions of extension programs at Iowa State University, Colorado State University, University of Maryland, North Carolina State University, and Pennsylvania State University. These include program descriptions, information on when the program was founded, staff, companies helped, budget, and sources of funding. (JB)



THE COMPETITIVE EDGE

Universities and Industry Working Together

The National Association of State Universities and Land-Grant Colleges



"In the global economy, knowledge is king. And those nations that excel at creating new knowledge and transforming it into new technologies and products will prosper in years to come."

—*BUSINESS WEEK*
June 6, 1992

The nation's small- and medium-sized manufacturers are vital to the success of America's economy. But today they are in serious trouble. They have lost their competitive edge because many lack the time, expertise and money to introduce better and rapidly changing technologies, replace old ways of manufacturing with new ones, improve quality, and train their work forces for the 21st century.

Government and business leaders agree that manufacturers can regain their edge only with the help of a greatly expanded national network of industrial/manufacturing extension programs, funded largely by the federal government. These programs, often modeled after agricultural extension, reach out to manufacturers and work with them directly, speeding the flow of technology and information.

Many groups and organizations must be involved in this industrial extension network. But the nation's public universities have a unique combination of experience, capacity and commitment to offer. With the help of America's great universities, the country's small and medium-sized manufacturers can regain their competitive advantage.

THE PROBLEM

They comprise 99 percent of the nation's manufacturers. They employ more than 60 percent of all American manufacturing workers. They produce more than half of all components used by large industrial firms. And they are the source of most new manufacturing jobs—the key to ensuring that America's future is prosperous and strong.

But while the nation's small and medium-sized manufacturers, employing 500 workers or fewer, are vital to the success of America's economy, their technical capabilities and productivity have declined steadily, dropping them further and further behind foreign companies. The result: fewer U.S. jobs, a lagging economy, and an America that is less competitive internationally.

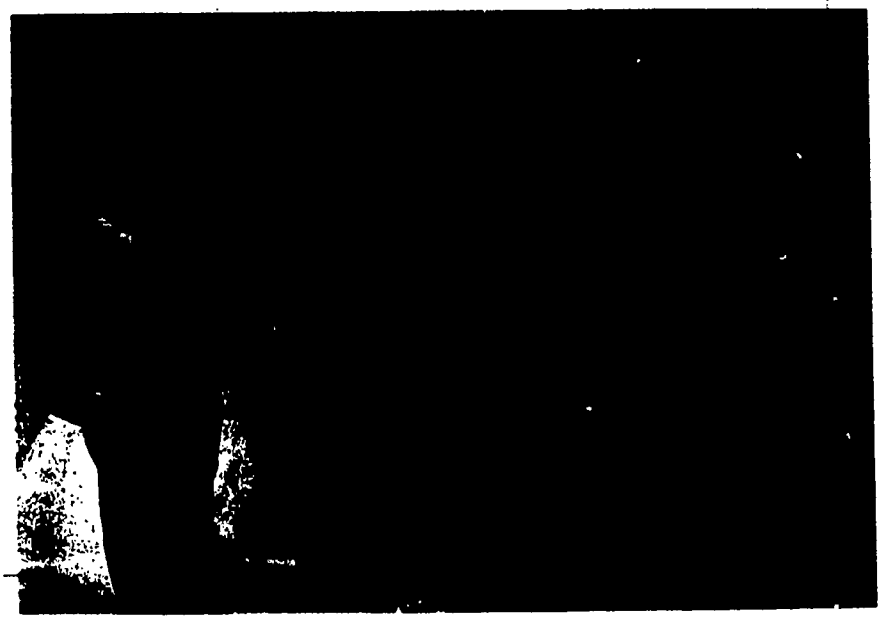
The Industrial Extension survey found that the 85 NASULGC institutions responding indicated that they had:

- Provided in depth help to business and industry more than 16,000 times last year
- Served almost 262,500 business and other organizations

Many of these firms have lost their edge because they lack the time, expertise and money to adopt better and rapidly changing technologies, replace old ways of manufacturing with new ones, improve quality, and train their work forces for the 21st century. As a result, they cannot keep up, either with large U.S. companies or small foreign firms. A few statistics tell the story:

- Japan has four times as many small firms using advanced machining centers and handling robots as the United States.
- Fifty percent more small Japanese firms use computer-controlled machine tools than do small American firms.
- Productivity in U.S. firms with 20 to 50 employees is only about two-thirds of that of U.S. firms with 500 or more workers.

To compound these problems, small and medium manufacturers also face a new serious challenge. Since the end of the Cold War, the nation's defense budget has been slashed, with more cuts to come. These cutbacks mean that thousands of companies, employing hundreds of thousands of workers, will have to convert quickly from defense manufacturing to producing civilian goods. This retooling is proving especially hard for the already-burdened smaller firms and could mean major layoffs and business failure.



ONE SOLUTION

A National Industrial Extension Network

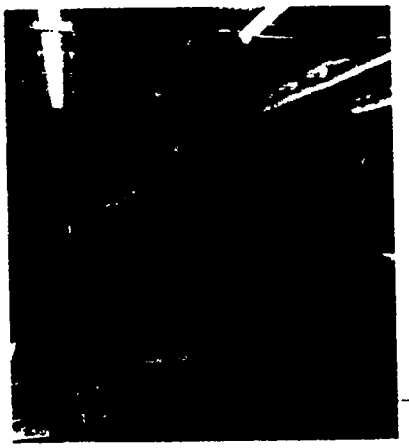
Government and business leaders agree that these manufacturers can regain the competitive edge with the help of industrial or manufacturing extension programs. Funded largely by government, these programs help small manufacturers modernize by speeding the flow of technology and information to them. Industrial extension programs reach out to manufacturers and work with them directly, often using field agents who cover a local area much the way county agents do in agriculture extension programs.

States and universities have offered a limited number of industrial extension programs for more than thirty years, many of which have been very successful. In the late 1980s the federal government also stepped up its involvement, with the Commerce Department's National Institute of Standards and Technology (NIST) and the Defense Department launching major industrial extension networks.

But the overall effort still falls far, far short of the need. Japan spends nearly $500 million a year on a vast network of industrial technology and extension centers. The United States spends only about a fifth of that, and U.S. programs reach just three percent of small and medium-sized firms.

Meeting the need will require a major expansion of federal, state, and local programs into a national industrial extension service network. But simply throwing money at the problem will not turn manufacturing around. To provide manufacturers what they want and need, a national network must:

- Build on successful programs already in place;
- Make available to manufacturers a wide range of services including access to technology, training, and engineering and management advice and expertise;
- Promote cooperation among national and local government, small and large firms, applied research and engineering institutions, training centers, and management organizations;
- Respond quickly and flexibly to the needs of local firms;
- Emphasize outreach;
- Use federal funds to leverage funds from state and local government and private sources; and
- Avoid duplication.



The top five results of help to manufacturers from university industrial extension programs as reported in a recent NASULGC survey were:

1. Reduced manufacturing processing costs
2. New business or products
3. Jobs created
4. Increased value - sales
5. New markets

THE UNIVERSITIES' VITAL ROLE

Many groups and organizations must be part of a national industrial extension network, but the nation's public universities possess the unique combination of experience, capacity and commitment that enables them to play a lead role.

EXPERIENCE. The nation's state universities and land-grant colleges have always been an engine for the economic development of their communities, their states, and the nation. They were founded to fulfill a mission that includes serving people, government, and industry through applied research and outreach. In the early part of the 20th century, the Smith-Lever Act created the Cooperative Extension Service—now universally recognized as the outstanding model of cooperation among universities, government and business—a model that provides American agriculture with the vast research capability and knowledge required to make it the best in the world.

But the land-grants' role in economic growth has not been limited to agriculture. Universities have helped meet the needs of industry through continuing education programs, applied research centers, and intellectual resources of a broad range of academic departments. Business administration and engineering departments have always had close ties to industry. University medical centers and biological science departments have nurtured the revolutions in biological sciences, medicine, pharmaceutical applications and biotechnology that have created a healthier nation. The great advances in computer technology are directly attributable to synergistic interactions between industrial scientists, engineers, and university researchers. The National Academy of Sciences recently cited "a virtual explosion over the past several years in the number and variety of university-industry alliances."

The most common services provided to clients from university industrial extension programs as reported in a recent NASULGC survey were:

1. Analysis of a product or process
2. Training and retraining
3. Design
4. Business market plans
5. Testing

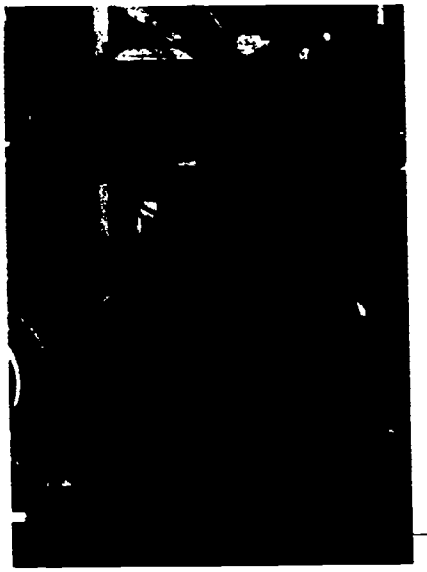
In particular, universities have long experience in running industrial extension programs that supply the real help that small and medium-sized manufacturers need. For example, a recent survey of members of the National Association of State Universities and Land-Grant Colleges (NASULGC) found that at least 85 higher education institutions had industrial-extension-type programs, some of which date back to the 1950s. Last year, these programs provided in-depth help to manufacturers more than 16,000 times. The greatest result of this assistance was to reduce manufacturing costs, followed by generating new business and creating new jobs.

Ample examples show how successful university programs have the flexibility to respond quickly. They work in partnership with federal agencies and laboratories, community colleges, state economic development agencies, and the private sector to provide information and resources local manufacturers need. Most of these programs bring the university's resources directly to manufacturers through field agents who get to know firms, anticipate or identify problems, and work with firms to find the best solutions.

CAPACITY. Universities give help that is timely, flexible, and effective because they have an unparalleled resource base—a source of solutions for smaller manufacturers' needs that no other institutions can match. What kinds of resources can they supply?

- Wide-ranging research capabilities in scientific disciplines that apply directly to manufacturing, as well as major resources in economics, business, management, and organization;
- An eighty-year record of working with business and industry in outreach programs to promote economic development;
- Programs in place to provide small and medium-sized manufacturers with the extensive training managers and employees need to compete in the international marketplace;
- Long experience in flexible interaction among scientists, engineers and entrepreneurs;
- Demonstrated ability to work in creative ways with federal agencies, community colleges, state economic development agencies, and the private sector to help firms solve problems; and
- Experience leveraging federal and state funds so that a single dollar invested yields many dollars in economic returns.

America's small and medium sized manufacturers can regain their competitive advantage . . . with the help of America's great universities.



COMMITMENT. Universities want to do more. But they will need help. The NASULGC survey found that most university centers have modest annual budgets of about $100,000 to $300,000, limiting the number of firms they can assist.

During a time of severe pressure on state and public university budgets, the universities will need federal funds from National Institute of Standards and Technology, the Defense Department and other agencies to broaden their reach. But universities are not asking the federal government to do this alone.

Eighty-five percent of the universities responding to the NASULGC survey committed themselves to expanding their industrial extension programs. Three quarters said they would be able to generate industrial extension matching funds for federal dollars from their state government, the university, or industry.

REGAINING THE COMPETITIVE EDGE

The nation's state universities and land-grant colleges are uniquely positioned to help revitalize the U.S. economy through a national industrial extension service network. No other single organization can offer the special combination of resources, knowledge, outreach, and access universities already possess. And none can match the universities' history and experience of working hand in hand with manufacturers to promote economic growth.

IOWA STATE UNIVERSITY

AT-A-GLANCE

The Center for Industrial Research and Service

FOUNDED: 1963

STAFF: 16 full-time, 2 part-time, plus undergraduate research assistants; includes 7 regional managers in offices located throughout the state.

COMPANIES HELPED: 800 major projects in the past year

APPROXIMATE ANNUAL BUDGET: $940,000

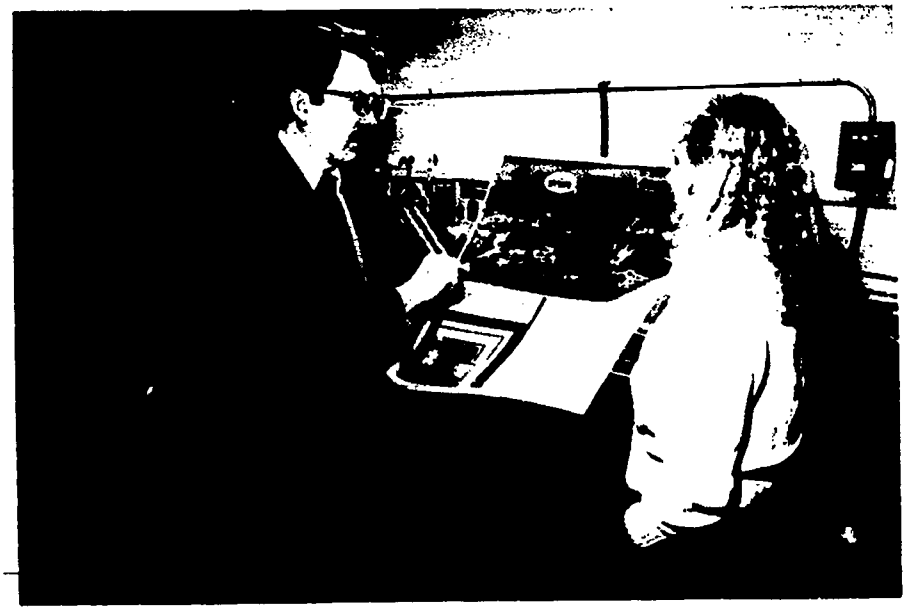
SOURCES OF FUNDING: Most from state appropriations, a small amount from user fees and some from federal and state agencies for specific projects.

When they hear the name "Iowa," people often think of cattle, wheat, and farms. But manufacturing is the largest source of personal income in the state. And Iowa is one of the few areas in the nation where, since 1986, manufacturing jobs have increased more than service jobs. All this makes the Iowa State University's Center for Industrial Research (CIRAS) more important than ever.

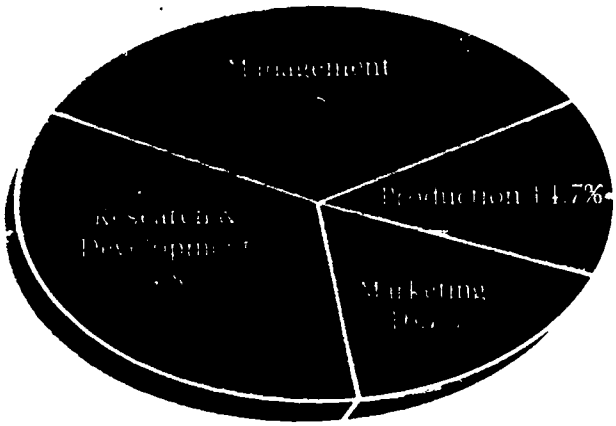
One of the nation's first industrial extension services, CIRAS was created in 1963 by the university and the state legislature to give manufacturers access to ISU's technical expertise. Now a part of ISU University Extension, CIRAS uses its $940,000 annual budget and its 16 full-time staff to provide management and technical assistance to Iowa firms, including seven staff who are regional managers in offices throughout the state.

CIRAS has powerful assets to offer. Each staff member averages more than 26 years of experience in manufacturing, with backgrounds in engineering, industrial technology, computer controlled machine tools, marketing, and management. They work with manufacturers one-on-one. "We try to educate the client in how to solve problems so they won't have to depend on us," says Del Shepard, Assistant Director of ISU Extension to Business and Industry, and the current head of CIRAS.

In many cases, the CIRAS staff itself can help the manufacturers, but often they link up firms to other university resources—a vast array of facilities and expertise at ISU that includes the engineering college,



Kinds of Project Assistance Provided by CIRAS in 1992



twelve applied research centers, and faculty throughout the university who have the particular expertise a company may need. CIRAS can also help firms work with Ames laboratory, a federal lab on ISU's campus run by the Department of Energy.

CIRAS helps overcome the hesitation manufacturers sometimes have in approaching a university, says Shepard. "Some firms are a bit intimidated by the university, or they think it's too ivory tower' to help them. We're a very non-threatening, familiar first contact point."

CIRAS opens the door to resources outside ISU, too. CIRAS works with other universities in the state and refers clients to community colleges when the need arises. It conducts joint projects with the Iowa Small Business Development Center program—a state- and federally-funded project to help small firms—and works with other state agencies that can provide financial and other support to manufacturers. It also has developed links to new technology centers in the state and can help firms get federal assistance.

Most of these services rely on resources many Iowa firms, 90 percent of which have less than fifty employees, would never be able to provide for themselves. And this assistance is widely sought after. Since opening its doors, CIRAS has chalked up more than 120,000 contacts with manufacturers and responds to 1,000 requests for help each year.

SUCCESS STORIES

A small Iowa manufacturer held a contract to make a product for one of the railroads, but the railroad would only purchase the product if it passed stringent abrasion and bonding tests. The small firm could not perform the tests and feared it might lose its contract.

It called CIRAS. Two CIRAS staff engineers reviewed the railroad's specifications and quickly made arrangements to perform preliminary tests on the product at ISU's Mechanical Engineering laboratories. The ISU lab found that the product exceeded the specifications. Armed with those results, the manufacturer produced a small product run for the railroad to test. The manufacturer now expects to obtain an initial order from the railroad for a year-long field test, to be followed by continued orders.

COLORADO STATE UNIVERSITY

AT-A-GLANCE

The Manufacturing Excellence Center & NIST/Mid-America Manufacturing Technology Center

FOUNDED: Manufacturing Excellence Center founded in 1988; designated as regional office of NIST/MAMTC in 1993.

STAFF: 9 full-time, including 5 field engineers who assist small- to medium-sized manufacturers; 25 field engineers will be added during 1994 in five locations around the state.

COMPANIES HELPED: 1,000 in the past year.

APPROXIMATE ANNUAL BUDGET: $750,000.

SOURCES OF FUNDING: Federal funds for MAMTC are matched on a dollar for dollar basis by state funds. About 80 percent of state funds come from CSU and about 10 percent from industry.

In January 1993, Colorado State University's dynamic young industrial extension program, the Manufacturing Excellence Center (MEC), was selected by the Commerce Department's National Institute of Standards and Technology (NIST) as a regional office for NIST's Mid-America Manufacturing Technology Center (MAMTC). As a result, the CSU program joined NIST's growing industrial extension network, expanding MEC's reach and capping five years of success and service for the innovative center.

MEC was created in 1988 by CSU engineering professor and current director of MEC Wade Troxell, and Byron Winn, former MEC director and head of CSU's mechanical engineering department. The two organized several university laboratories and centers into a consortium aimed at helping small companies use technologies to solve manufacturing problems.

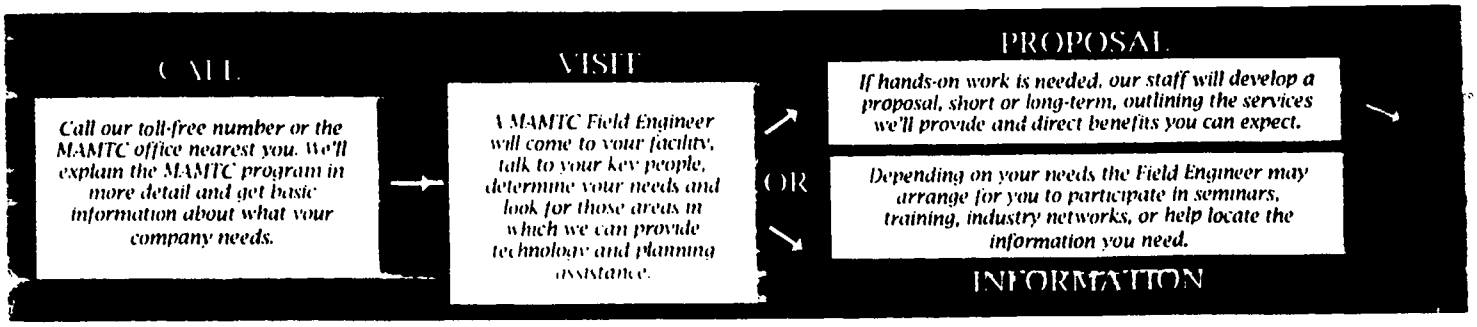
"We started slowly by involving just a few labs initially and using faculty members who had a track record with industry," Troxell says.

Now MEC includes 28 laboratories spanning six colleges. The labs provide a wide-ranging menu of knowledge, expertise, and facilities ranging from the very technical, such as robotic systems and computer engineering and design, to business practices such as human resource placement and consumer assessment, to environmental protection and energy conservation.

"We are quick to react to the needs of manufacturing firms," says Winn. "We pride ourselves on being problem solvers."

Until CSU became a part of MAMTC, Troxell was MEC's only real outreach staffer and the main point of contact for manufacturers who wanted help. He either put companies together with a lab that could help or organized an

The MAMTC Process



ad hoc team of resources, charging businesses on a cost-per-service basis.

But despite its small staff size and annual budget of only about $10,000, MEC helped more than 800 companies and had more than $1.5 million per year in contracts. It also won kudos from manufacturers for its quick response and innovative solutions. But MEC's small size limited its outreach.

Becoming the Colorado regional office of MAMTC has changed that. Field engineers will visit every manufacturer in their region over an 18-month period. "These are trained engineers with experience in industry. When they talk to a small company, they can really relate in a business-oriented, bottom-line kind of way," says Troxell.

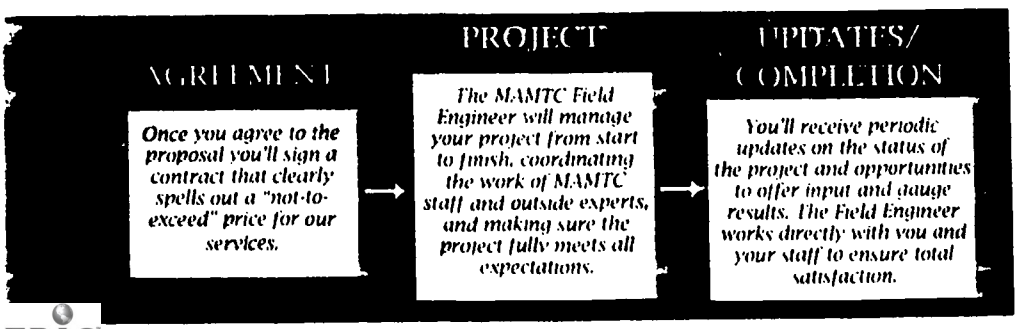
As a MAMTC office, the Colorado State program will also be able to offer a wider array of resources to companies, tapping into the expertise and facilities from other universities, small business development centers, economic development specialists, or private consultants.

Winning designation as a MAMTC regional office was clearly a product of MEC's approach and its success. "Our focus on helping companies become more competitive meant we had to listen to them as opposed to telling them what we had to give them. The companies we helped told our story. They made the case for us," says the director.

SUCCESS STORIES

CBW Automation of Fort Collins, Colorado discovered that its automated equipment to stack, count and inspect plastic lids and containers had been made obsolete by a competitor. The company approached MEC. Within three months, MEC labs combined their technical expertise to help CBW produce one of the fastest robots in the world. The robot jumped CBW ahead of its competitors and now accounts for most of CBW's business.

Baker Instruments in Fort Collins, Colorado needed to supply a West German company with a tool to automate the on-line testing of electric motor armatures. But Baker Instruments lacked the expertise to do so. It came to MEC, whose engineers solved the problem by developing a prototype of the automated tool. The company is now positioned to enter the consumer-products market, selling to companies that make hair dryers, blenders, and other small appliances.



UNIVERSITY OF MARYLAND

AT-A-GLANCE

Technology Extension Service

FOUNDED: 1984

STAFF: 12 full-time equivalents, including 7 technical consultants working directly with industry, a director and support staff.

COMPANIES HELPED: 250 major projects in the past year

APPROXIMATE ANNUAL BUDGET: $600,000

SOURCES OF FUNDING: Most of the budget comes from the state through university funds. A small amount comes from NASA through the Mid-Atlantic Technology Applications Center.

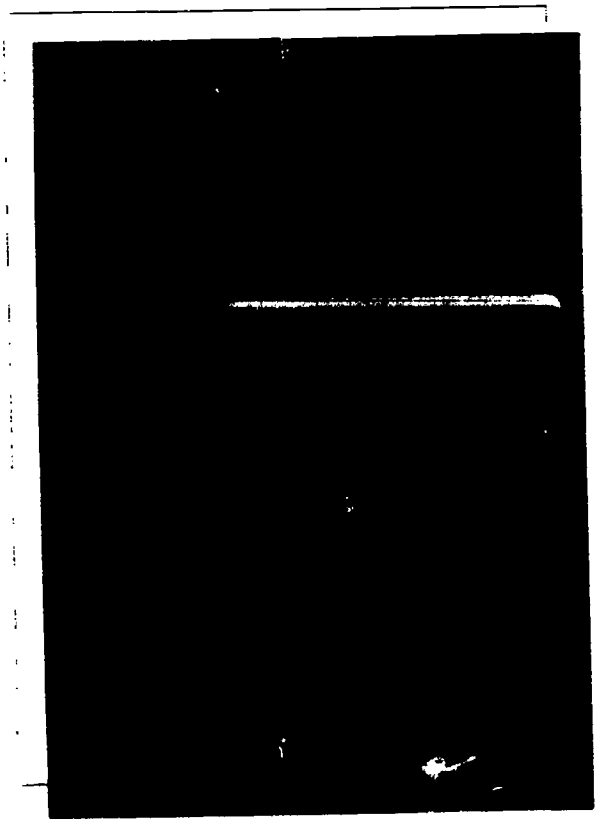
Founded in 1984, the University of Maryland's Technology Extension Service (TES) brings the university's expertise directly to the state's industrial firms, relying heavily on its staff of seven full-time technical consultants. Six of the consultants, engineers with decades of experience in manufacturing, are based in regional offices throughout Maryland. The seventh, who operates out of TES' headquarters on the College Park campus, specializes in finding ways federal and national labs can help local manufacturers.

The consultants respond to requests for help but also visit firms regularly to anticipate problems or suggest improvements. Most of the services are free; TES will provide a company about five professional staff days of work without charge. TES also matches up the company with other programs and resources. Last year, TES helped companies solve some 250 problems covering a wide range of areas, with the modernization of plants and procedures near the top of the list.

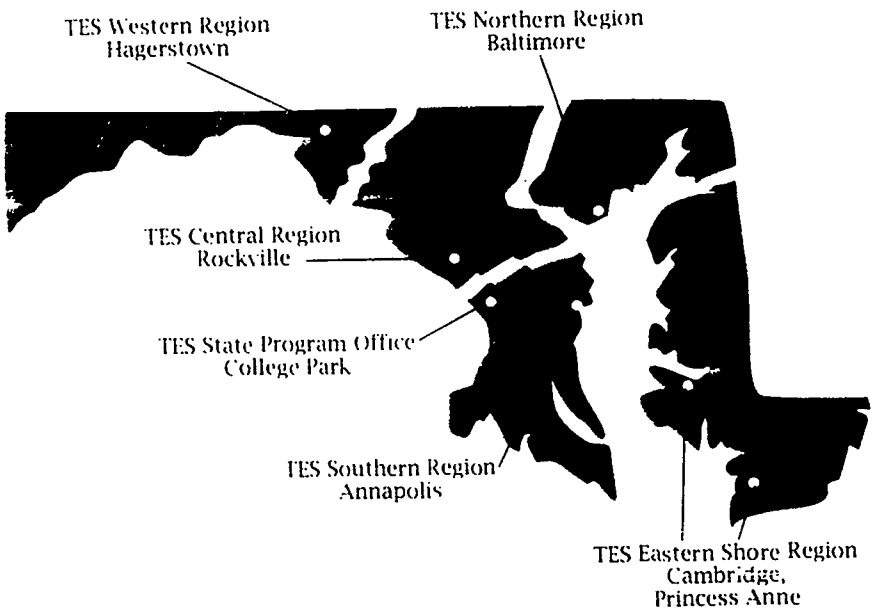
Entering its second decade, the program is clearly a success. Satisfied companies have showered TES, the university, the state legislature, and the governor's office with unsolicited testimonials.

In explaining why the program has done well, TES staff emphasizes two related assets—the resources to which they have access as a part of the university and the flexibility to use these assets creatively to meet the needs of individual firms.

As part of the Engineering Research Center (ERC), which promotes close ties in engineering and science between the university and industry, TES can link its clients to a range of laboratories and individual experts, plus offer an "incubator" for start-up companies and a program of matching funds for joint industry/university research.



Technology Extension Service Regional Offices



TES also reaches far beyond ERC. In 1993, TES called on 135 faculty and staff from 48 university departments and applied research centers. Reaching further afield, TES hooks up manufacturers with faculty or facilities at other universities or community colleges. And TES regularly makes connections to trade associations, state agencies and departments, and federal programs.

But the access to these assets would be useless without the flexibility to use them. "We don't support a cookie cutter approach," says TES director Travis Walton. "We do whatever we can to try to fit a solution to match a company's need."

The flexibility starts with the field agents, who get to know individual companies very well and are encouraged to be what Walton calls "entrepreneurial" in seeking solutions to problems. The university administration and department heads also strongly support TES' flexible approach. Unburdened by red tape, the field agents are able to put together ad hoc teams that include faculty members, research facilities, business support people, or whatever else may be required.

"We try to make it very painless for a company to get assistance," says Walton.

SUCCESS STORIES

A Baltimore woman who had a small business making and selling a home accessory could fill orders for her product as long as the demand was for only a few units a month. But she wanted to expand and needed help improving the manufacturing process. She contacted TES. TES developed a complete work flow diagram, recommended plant layout, estimated capital equipment costs, and made profit forecasts. The service also showed how the project could be implemented in three phases and recommended ways the product could be improved to make it easier to manufacture. Armed with this information, the businesswoman is now marketing her products through a national mail order firm and will be able to meet the expected high demand.

NORTH CAROLINA STATE UNIVERSITY

AT-A-GLANCE

Industrial Extension Service

FOUNDED: 1955

STAFF: 70, including 20 engineering specialists

COMPANIES HELPED: 2,000 major projects in the past year

APPROXIMATE ANNUAL BUDGET: $6 million

SOURCES OF FUNDING: State appropriations provide $1.2 million, fees for services generate $2 million; specific industry- and government-supported projects provide $3.1 million.

North Carolina is home to the nation's first industrial extension program, the Industrial Extension Service (IES) at North Carolina State University's College of Engineering. Established by the state legislature nearly forty years ago, IES today is one of the largest and most extensive programs of its kind. With 70 employees and a $6 million budget, it provides services to 35,000 individuals and companies a year.

IES helps companies of all sizes, but 90 percent of its clients are small and medium-sized firms. IES helps these firms solve short-term problems, conducts applied research, and brings the latest technology and modern management practices to North Carolina manufacturers. "The bottom line for us is helping our industry become more competitive and get a better market share," says IES Director Tom Stephenson.

One of the distinctive features of IES is its emphasis on continuing education. "It's about 60 percent of what we do," says Stephenson. IES offers a smorgasbord of courses and workshops throughout the state for small and large groups, covering everything from just-in-time manufacturing to solar energy. Its courses reach business executives, entrepreneurs, engineers, and local government officials.

When firms come to IES with a problem, its engineering specialists do on-site assessments, providing up to two days of technical assistance free of charge. When more extensive help is needed, IES can provide services under contract or link the companies up with other resources.

As part of the College of Engineering, IES has easy access to a head-spinning array of resources. IES can come to the rescue by putting together ad hoc teams of faculty, graduate students, and extension specialists to do applied research on contract, often developing new technology the manufacturer can use. The College of Engineering also has an array of on-going projects in place that can help.

In addition, IES connects firms to other departments of NC State and to other education institutions around the state, especially the community colleges. IES is also hooked into state economic development agencies and has links to EPA, NASA, and other federal agencies that can help companies in the state.

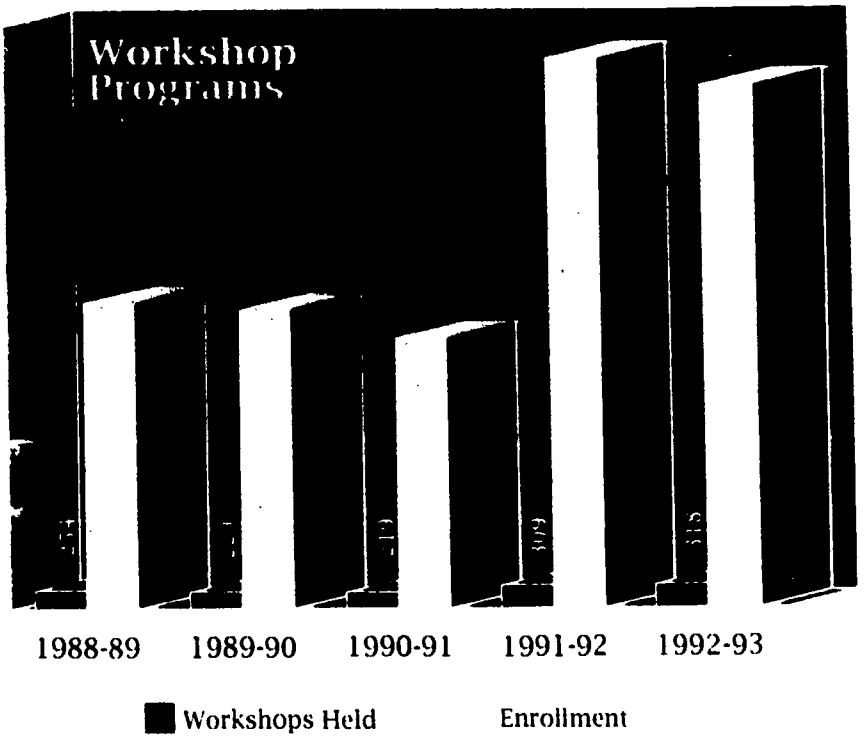
Stephenson argues that IES' close ties to a major university is an invaluable source of strength. "The prestige and neutrality of a university—we're not trying to sell a product—helps immediately to gain the confidence of companies. And our specialists can get an expert from the university on the phone in five minutes. In many other organizations it would take days to get an answer. Our extension people can both communicate to industry and seek out people in the university who will have a real-world approach to industry's problems."

IES's formula is proving cost effective. According to surveys of its clients, IES services led to a direct annual gain to industry of about $40 million, or over $33 for each state tax dollar appropriated.

SUCCESS STORIES

A North Carolina manufacturer of small electrical appliances was having trouble reducing in-process inventories. It called on a team from NC State headed by a specialist from IES, which showed the company how to implement certain just-in-time production methods. The changes reduced the company's inventories by $400,000 and reduced annual costs by more than $50,000.

A three-person North Carolina company that sells upper-end garden ornaments through mail order needed help launching a new product line made by combining art glass with metal supports. IES specialists provided metallurgical and manufacturing assistance along with design services. The result: the company came up with a totally new product that racked up $100,000 in sales.



AT-A-GLANCE

Pennsylvania Technical Assistance Program (PENNTAP)

FOUNDED: 1965

STAFF: 10 full-time, including 5 engineers who work in regional offices throughout the state.

COMPANIES HELPED: 400 clients, 620 projects in the past year

APPROXIMATE ANNUAL BUDGET: $1,000,000

SOURCES OF FUNDING: About two-thirds from Pennsylvania State University, about 20 percent from the state government, and the rest from the federal government and other sources

"At Penn State we have an economic development system with many entry points to help manufacturers," says Jack Gido, director of the Pennsylvania Technical Assistance Program (PENNTAP). One of the nation's first industrial extension services, PENNTAP is the focal point of that system.

Founded in 1965, PENNTAP is a partnership between the Pennsylvania Department of Commerce, the U.S. Economic Development Administration, and the 23-campus Pennsylvania State University system. Its 10 full-time staff, including five engineers who work out of field offices throughout the state, work directly with small and medium-sized companies.

PENNTAP specializes in providing free short-term technical expertise and information to firms that do not have the in-house resources or time to solve specific technical problems. Its staff can provide what is needed, either from its own experience and knowledge, or by locating information and speeding it to the client. When manufacturers need more or longer-term help, PENNTAP links up firms with resources.

In many cases that resource is Penn State, which is an especially powerful economic development system. The 23 campuses of the university system offer expert faculty from many disciplines as well as extensive cooperative extension and continuing education resources. In addition, Penn State is the home of one of the most impressive collections of applied research laboratories in the nation.

"Penn State is second only to MIT in the amount of industrial-sponsored research conducted on campus," notes Gido.

But the university's assets are only the start of what PENNTAP makes available to manufacturers. PENNTAP is tied closely to state economic development agencies, working with them day-to-day and complementing their work. PENNTAP also links clients with other universities that have specialized expertise or training

capabilities and puts the manufacturers in touch with other private companies, or locates consultants who can help them solve problems.

PENNTAP offers access to federal programs as well, working closely with the NASA Regional Technology Transfer Center in Pittsburgh and the National Technology Transfer Center, in Wheeling, West Virginia.

PENNTAP's record in helping Pennsylvania business and industry speaks for itself. It assists firms on more than 600 projects a year, regularly surveys its clients to ask how satisfied they are and asks what improvements they would like to see. The surveys show 97.3% customer satisfaction with the assistance provided.

Because of this success, PENNTAP has won the Technology Transfer Society's Justin Morrill award, presented to organizations whose success sets standards of excellence for others.

Gido traces the success to PENNTAP's "flexibility and fluidity." The program works hard at ensuring that bureaucratic or other roadblocks don't get in the way of its goal: serving the needs of the states' business and industry. "We want be a gate opener, not a gate keeper," he says.

SUCCESS STORIES

A Pennsylvania furniture manufacturer had problems with the adhesives used at its plant. It contacted PENNTAP, which found a better glue for the manufacturer and suggested affordable improvements it could make in its equipment. By adopting the changes PENNTAP recommended, the manufacturer saved $80,000.

After 35 years of producing patio roofs, decks, carports, room enclosures and screen rooms for owners of manufactured homes, mobile homes and recreational vehicles, a manufacturer faced layoffs because of the recession. The company decided to explore the home improvement market. But to do so it had to be sure its insulated roof systems met national and regional standards. The firm contacted PENNTAP, which helped the company receive financial assistance. Thanks to PENNTAP's help, the manufacturer was able to meet the standards and develop new products.

"Universities have a real awareness of what's going on out there. You can get creativity, state of the art ideas, powerful processes, and new ways of doing things. They can keep industries on an innovative edge."

—Paul Boerger, Project Manager, Apogee Robotics, Colorado

"I have a lot of confidence in CIRAS. They helped us a lot when we were getting started struggling in the early days. And over the years, their advice has helped us become more profitable."

—Dave Braland
Record Printing Co.,
Iowa

"[PENNTAP] opened doors to wood research that will result in dozens of jobs."

—Dan Howard, Jr.
Carrousel Wood Products,
Pennsylvania

"The assistance I have received from the state through the Technology Extension Service of the University of Maryland has been extremely helpful."

—Sanford Glazer,
President
Medical Waste Technology, Inc.,
Maryland

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Colorado State University, MEC and MAMTC: page 9
Iowa State University, CIRAS: page 4, page 6
North Carolina State University, ILS: page 12
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University of Maryland at College Park, ILS: cover, page 3, page 5, page 10

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