

Artificial potato pinpoints trouble

UNIVERSITY PARK — A potato that can "feel" pain is helping agricultural engineers at Penn State find ways to prevent damage to real potatoes.

"As farmers well know, potatoes can be cracked or bruised — either by mechanical or human handling — during harvesting, shipping or processing. They can even be damaged in storage," says C. Terry Morrow, associate professor of agricultural engineering.

"Our artificial potato helps pinpoint where and how damage to real potatoes occurs. Engineers can then use this information to design machines and methods to prevent the damage."

Developed at Penn State by a research team headed by Morrow and funded by the National Science Foundation, the artificial potato contains electronic and mechanical sensors that detect damage-causing stresses and

forces. The potato transmits its measurements to the researchers, who record and analyze them using micro-processors.

With a molded, silicone rubber exterior, Morrow's potato looks like the real thing.

Farmers and machinery manufacturers, he says, will be able to send it through harvesting and processing systems to identify where damage is occurring or most likely to occur.

"In a number of tests using actual machinery, real potatoes and the artificial potato, the artificial potato was very precise in measuring and predicting damage points," Morrow notes.

"In fact, the artificial potato is valuable not only in identifying damage points in existing machinery and systems, but also in helping engineers predict how to design machinery to avoid damage."

The project is part of Morrow's on-going research into the physical and mechanical properties of biological materials. Assisting him with development of the potato was N.D. Halle, a former graduate student who is now an extension agricultural engineer at the University of Maine.

"Just as materials like concrete and steel have points at which they fall due to external forces, so do the biological tissues of fruits and vegetables," Morrow explains. "Our studies — on such agricultural products as apples, potatoes and cereal grains — are intended to detect the relationship between external forces and damage, and predict how to avoid it."

In the potato studies, for example, the Penn State researchers have discovered that smaller potatoes can handle less of a weight load before cracking than larger ones.

"Because of this, we recommend that potatoes be sorted by size before being placed in storage containers. This can prevent smaller potatoes from ending up on the bottom of the pile, where they are more likely to crack," Morrow says.

In some cases, he observes, the shape of storage containers or bins can play a crucial role in preventing damage to the potatoes.

"Depending on the size and shape of the potatoes being stored, it might be desirable to have sloped rather than vertical sides to remove some of the weight load from the potatoes on the bottom," Morrow explains.

In other cases, machinery may move potatoes too fast and bump them around with too much force.

In all cases, however, the Penn State artificial potato is willing to take the pain for the benefit of its real brothers.

Brockett's Ag Advice

By John E. Brockett
Farm Management Agent
Lewistown Extension Office



Deductible Expenses

Farmers usually remember the usual expenses such as feed and fertilizer. The ones that are missed are: business share of car expenses; interest that was added into a loan because it was delinquent or just accrued; office supplies such as stamps, envelopes, pens; work and show clothes; indirect advertising such as furnishing trophies to shows; and farm related conventions, seminars, or tours. Be ready to document these expenses, especially if you take a trip to Hawaii.

Capital Gains

Items that are eligible for long term capital gains treatment have a definite advantage. The maximum tax you will pay on the profits from these items is 20 percent.

Some items would be eligible for long term capital gains treatment if they were owned long enough. The profit from the sale of these items would be a short term capital gain. It is taxable at the regular rate but is not subject to social security taxes nor does it reduce social security income. A good example of this would be dairy heifers under 2 years of age sold for dairy or breeding purposes.

Investment Credit

A major decision to make concerning investment credit is: "Do I take the \$5,000 capital expenditure as an expense and forgo the investment credit or not?"

The answer depends on: your tax bracket; carryover of prior year investment credit; effect of income averaging; effect of the

alternative minimum tax; and forecast of 1983's taxes.

One thing to consider: investment credit cannot be saved if you have income taxes due. However if the alternative minimum tax causes you to pay extra taxes you do not lose that investment credit.

Example: You have an income tax of \$5,000. You also have \$5,000 worth of investment credit so your actual income tax is \$0. However, because of some extraordinary cow sales you have a minimum tax to pay of \$2,000. Since that \$2,000 negated \$2,000 of the investment credit, you really did not use that amount of credit. You can now use that credit to carry back or forward for use in another year (up to 15 years forward).

Dual Expenses

Some expenses are a result of personal and business use. Examples are car expenses, real estate taxes and insurance which include the house, electricity, telephone, and possibly some hired help. Be reasonable when allocating these expenses. It is fairly obvious that a family with one car and two teenage drivers probably uses that car more for personal use than the family with no teenage drivers.

Real estate taxes and casualty insurance could be apportioned in relation with values set on the house as opposed to the total farm. Liability insurance would probably be greater on the business side versus personal than casualty insurance. An electrically-heated home would have more personal use electricity than one using some other type of heat.

Meetings explain changes in Del. soil tests

NEWARK, Del. — A series of meetings will be held in Delaware next month to explain recent changes in the University of Delaware soil test laboratory's program for commercial crops.

A meeting is planned for fertilizer representatives on Tuesday, Feb. 1, from 9 to 12 noon at the Capital Grange in Dover. This will be followed by three evening meetings for farmers on Tuesday, Feb. 8, from 7 to 9 p.m. at the Capital Grange in Dover; Tuesday, Feb. 15, from 7 to 9 p.m. at the University of Delaware Substation near Georgetown; and Wednesday, Feb. 16, from 7 to 9 p.m. at the Silver Lake School in Middletown.

Soil scientist Leo Cotnoir says the purpose of the meetings is to discuss the philosophy of the University's soil testing laboratory and acquaint commercial fertilizer dealers and farmers with changes being made in recommendations and reporting procedures.

"There has been no change in our soil test philosophy," says Cotnoir. "We still consider testing a production tool for optimizing yield and maximizing profit. But we have revised some of our recommendations to bring them up to date with the latest available research."

Changes have also been made in the information requested from farmers when they submit soil samples for analysis. "We're trying to encourage them to take a closer look at all the factors in-

voled in producing their crops," Cotnoir says. This includes soil type, yield goals and production practices.

"Our report forms have a new look," he says. "They've been changed to encourage users to look more closely at their own farming practices and base fertilizer decisions on these." The reports will be accompanied by fact sheets designed to make growers more aware of their fertilizer options, in the interest of greater cost effectiveness.

The meetings are open to everyone regardless of race, color, sex, handicap, age or national origin. For further information, contact Extension offices in Newark 302/738-2506, Dover 302/736-1448; and Georgetown 302/856-5250.



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Mason-Dixon P. Hereford plans field day, sale

SWANTON, Md. — At the last meeting of the Mason-Dixon Polled Hereford Association plans were made to hold the annual meeting and field day at Flat Stone Lick farm, Route 1, Marianna, on Saturday, June 4, 1983.

Dr. Leslie P. Midla, manager of the farm and a member of the board of directors will serve as chairman of the event. The program will feature "The Importance of Fertile Females in the Cow Calf Operation."

The Spring Sale will be held on

Saturday evening, May 14, 1983 at 7:30 p.m. Plans also are progressing to hold the MDPHA first annual show as a part of the Greater Cumberland Fair the first week in August.

The Mason-Dixon Polled Hereford Association is now composed of about seventy registered and commercial cat-

tlemen in the states of Maryland, Pennsylvania and West Virginia. Individuals desiring more information about the organization should write Mrs. Brenda Jenkins, secretary, Star Route, Box 35, Friendsville, Md. or Dr. William H. Buser, P.O. Box 3025, Swanton, Md. 21561, or call 301/746-5321 or 301-387-6930.

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