

March 2005
Vol. 5, No. 2

In This Issue...

Client Feature -
The McCahills
pages 1-2

Focus - Poultry
page 3

Assistive Technology
Notes
pages 4-5, 8

Project Feature -
Delaware-Maryland
AgrAbility Project
(D-MAP)
pages 6-7

References &
Resources
page 8

*The National
Grant Program
of the
AgrAbility Project
is a joint effort of*

The USDA Cooperative
State Research, Education
and Extension Service

University of Wisconsin-
Cooperative Extension

Creativity and Technology Help a Delaware Couple Keep Raising Chickens

Growing up in Long Island, New York, Brian and Diann McCahill never gave much thought to a rural lifestyle. In 1978, the young couple lived and worked in a Connecticut town. But that was about to change. One evening at their bowling league, a team member mentioned he had family that farmed in the Delmarva region. Brian and Diann were intrigued and made arrangements to visit the operation.

Shortly after visiting the farm and then researching contract chicken growing, the McCahills decided to move to Frankford, Delaware to set up their own poultry operation. Brian and Diann quickly settled into farming life and started a family. Today, Brian and Diann happily tend to more than 100,000 birds daily for Perdue Farms.

However, Brian's back – injured while working for a newspaper company in Connecticut – deteriorated over the years. He has had three separate operations, the last of which fused vertebrae in his lower back. The constant bending and kneeling required tending to the chickens also affected Brian's knees and led to two operations on his left knee. Arthritis developed in Brian's shoulders further decreasing his capacity to work around the farm.

When Diann injured herself on the farm in 2002, the McCahills started to worry that the physical demands of their current operation may be too much for them. Diann had sustained permanent damage to her left hand when her gloved fingers caught in a drill she was using to position the water lines in the chicken houses. It was during her occupational therapy at the local Easter Seals affiliate they learned of AgrAbility and were introduced to Sally Van Schaik with the Delaware-Maryland AgrAbility Project.



Diann and Brian McCahill at the controls of their water pressure adjustment system.

Client Story

The McCahills

Sally visited the McCahill farm and conducted an onsite assessment of their poultry operation. In addition to the modifications Brian developed (*see bottom panel*), AgrAbility identified several ways the McCahills could reduce the lifting and bending necessary in their daily chores.

The McCahills and Sally enlisted Debbie Post of Delaware’s Department of Vocational Rehabilitation (DVR) to help the McCahills finance the modifications. It was DVR’s first case working with a poultry farmer and they were able to help fund a pallet fork, dead-bird incinerator, and whole house water pressure adjustment system.

The pallet fork attachment for the front-end loader enables Brian to unload 50 lb bags of poultry litter treatment and water conditioners by the pallet instead of individually. The 500 lb capacity incinerator greatly reduces the composting required to dispose of dead birds.

However, it is the new water system that has been the greatest help. In the past, Brian needed to kneel down and adjust 84 water regulators individually in the chicken houses. Now, with a PDS (Pneumatic Drinking System) Control and Regulator system that connects all water regulators to one control, Brian only has to make one adjustment in each house to change all the regulators. Diann feels that “the best benefit is I don’t see Brian in pain. I could see how sore he was after adjusting the regulators. He’d come in and sit down after working all day, but then couldn’t get up

and move. Now, he’s free from that. I can see the biggest difference.”

The new water system also includes automatic and programmable flushing capabilities to clean the water lines. This feature eliminates the need to carry dozens of buckets of water to change the birds’ drinking water. “It was hard to carry buckets with my hand. I had to switch hands frequently,” recalls Diann.

Brian feels as though he’s “80 percent better” since they installed the modifications. However, to him the greatest benefit is the fact they can stay in the life they chose more than 26 years ago. “I used to worry about Diann if I couldn’t work. They [Delaware-Maryland AgrAbility Project] saved us a lot of pain and prolonged our life here on the farm” states Brian. “We enjoy it on the farm. We saw our kids grow up since we were on the farm.”

The McCahills are thrilled with the assistance AgrAbility provided. “If Diann didn’t get hurt,” Brian speculated, “we might not have known there are people out there who want to help you. Farmers don’t realize there are agencies out there. I think it’s great.”



Diann, Brian and the chickens with the PDS water control system and Chick Mate feeders.



Brian and Diann McCahill were honored by Easter Seals and the Delaware-Maryland AgrAbility Project (D-MAP) with the 2004 AgrAbility Award. “Brian has been very innovative in developing practices that can make his work easier,” said Sally Van Schaik, D-MAP staff member. He has installed dead bird disposal doors on one side of the chicken houses to reduce walking when disposing of dead birds, designed brood partitions that don’t require digging out litter to install, and constructed a paper rack to easily dispense brood paper. ❖

Diann and Brian McCahill with Sally Van Schaik (left).

Broiler Chicken Production in the U.S.

The commercial broiler industry in the United States began in Delaware over 80 years ago. A “broiler” is a chicken raised for meat rather than eggs. Before the development of the broiler industry, chicken meat was mostly a by-product of egg production. Chicken was reserved for special occasions and not consumed on a regular basis.¹



Inspecting broiler chickens.

Large-scale, year-round broiler production became possible in the mid 1920's. Scientists developed ways to meet the nutritional needs of chickens in protected environments.

Today, Americans consume nearly 80 lb of chicken per person annually, which is more than either beef or pork. Nationally, broiler production has increased greatly to meet this demand. The National Agricultural Statistic Service reports over 170 million broiler chicks are placed on feed each week. The average live weight of the broilers produced is 5.06 lb. Broiler industry has emerged from millions of small backyard flocks in the early 1900's into less than 50 highly specialized, vertically integrated agribusiness firms.

The vertical integration of the broiler industry provides an efficient way to produce chicken meat. Integrators are companies with hatcheries, feed mills, grain elevators, processing plants, and distribution networks who contract with individual farmers to grow chickens. They do everything in the process of delivering fresh chicken to the marketplace except tending the birds. Ownership of the birds is maintained by the company.

Contract growers, often family farmers, contract with the integrators to grow chickens. A family farm unit on a full time basis is generally considered to be

approximately 120,000 birds.² Growers must adhere to the specific quality standards established by the integrator. The primary functions of the grower are to feed and water the birds and monitor and maintain environmental conditions in the house (temperature, humidity, and air quality) to ensure a comfortable environment for the birds. Growers are paid an agreed dollar amount per thousand birds based on the contract.

The integrator delivers the chicks from the company hatcheries to the grower. For energy reasons chicks are placed in one end of the house upon initial placement. As the chicks grow, the area is expanded until the entire house is open to the flock. The floor of the house is covered with litter, a wood-based bedding material that is normally distributed in poultry houses prior to birds being placed. Without any significant disease, there will be a normal mortality rate of 4 percent. The integrator returns approximately 50 days later to pick up the adult chickens. ❖

Photographs courtesy of the USDA On Line Photography Center, <http://www.usda.gov/oc/photo/opclibra.htm>.



The interior of a broiler chicken house

Assistive Technologies for Poultry Operations

Poultry growers with disabilities are a growing clientele within the Delaware-Maryland AgrAbility Project (D-MAP). It is not too surprising since there are more than 2100 poultry growers in the Delmarva area and 1 in every 4 farms in this area raises poultry. Disabilities among this significant farm population in Delaware and Maryland include the following: arthritis, orthopedic conditions, injury, vision and hearing impairments, stroke, respiratory conditions, and other health conditions. The following are technologies and workplace modifications D-MAP commonly recommends for its clients. Although some of the equipment recommended is now standard equipment in newer poultry houses, growers who work in older poultry houses should consider the labor saving value of these technologies.

Mobility Around the Farm

For growers who have mobility or endurance limitations, it may be difficult to check on the flock and remove dead birds to disposal areas. A utility vehicle or modified golf cart can facilitate mobility and also serve to carry cargo.

Some growers may benefit from equipment that reduces the number of trips to their poultry houses by allowing them to monitor environmental conditions from their home. A phone dialing alarm system (fig. 1)³ is standard equipment in new poultry house construction. Older poultry houses without updated alarm systems may require the grower to make frequent daily trips to inspect houses. These inspections are needed to guard against serious equipment malfunctions that could be costly and/or cause catastrophic bird loss.



Figure 1: A typical phone alarm system allows growers to remotely monitor house conditions.

Installation of a phone dialing alarm system would reduce

the number of trips made by the grower to check on the houses.

Electronic devices to monitor temperature, power outages, and malfunctions in the water and feed systems are becoming standard equipment for many growers. Manufacturers of these devices have realized the advantages of convenient remote control and have produced communications software that will allow growers to access their controllers as if they were there in the poultry house.

In-House Mobility

Growers must walk around their houses several times a day to remove dead birds and check the birds and equipment. Crossing over equipment is one task that some growers may need assistance with inside a poultry house.

Migration fences are used to keep poultry properly distributed and are especially important in tunnel ventilated housing. These fences are often too high for growers to step over easily or contain only a gate in the center of the house to walk through. An adaptation for growers with mobility issues may be to use an 8 in. diameter plastic drain piping as a migration fence. Often this is easier for a grower to traverse than a higher fence (fig. 2).³ In some cases, simple hand grips and grab bars at key locations provide growers a support aid they need to climb over low migration fences.



Figure 2: 8 in. diameter drain tubing used as a migration fence separate the birds within the chicken house.

Another potential obstacle to in-

house mobility is drinker lines. In many poultry houses that are 400 or 500 ft long, it is common to find drinker lines that are 200 ft long. Stepping over the 12 in. high drinker lines can be very difficult, especially when the grower needs to remove large dead birds. Breaking long drinker lines into shorter sections creates alley ways for growers to carry dead birds to the side of the house without crossing drinker lines or having to walk hundreds of feet. Creating additional sections of drinker lines means additional pressure regulators to check. This can be addressed by installing a central pressure controller where all drinker lines can be adjusted at a single location.

Dead birds are difficult to pick up, carry and remove from a house, especially heavier, older birds. One option to reduce handling of the dead birds is a conveyor system that can carry birds to the end of the house (fig. 3).³ From the conveyor the dead birds fall



Figure 3: Dead birds are carried to the end of the house by a conveyor.

into a tractor bucket or other transport device and are carried to a compost or incinerator.

Another strategy to reduce the distance a grower must carry dead birds is the installation of a

series of small insulated doors along the side walls. These doors are similar to the doors sometimes used in homes to let dogs and cats outdoors. The doors allow dead birds to be placed outside the house where a grower can pick them up with a farm utility vehicle or a tractor with bucket for transport to the disposal site. These doors are especially helpful in newer houses which tend to be wider and have fewer access doors.

Litter treatment products are spread in houses prior to chick placement. Using a common lawn fertilizer spreader with small hard tires is difficult for growers to maneuver over a litter-covered floor. A spreader

equipped with larger pneumatic tires makes this task much easier for growers (fig. 4).³

Feeding Chicks

Chick feeding can be a challenge for growers who have to roll out paper or position box lids to contain the feed. Frequently, chick feeding is done by hand. Installing Chickmate® Baby Chick Feed Dispensers on existing feed lines can be a tremendous labor saver. In older houses a pull or rail-type feed cart is found to be a solution to help with chick feeding.



Figure 4: A spreader with large tires can help spread litter treatment.

Feeding paper is commonly used when chicks start eating feed. Placing the feed on the paper makes it easier for chicks to eat. The task of rolling out this paper over the entire length of a house under each feed line can be very strenuous on a person's back, knees and legs. Devices are available that attach to a farm utility vehicle or a golf cart to help roll out feeding paper.

Dead Bird Disposal and Composting

Composting is a common practice for disposing of dead birds. Individual compost bins are usually rectangular in shape and constructed of heavy lumber (fig. 5).³ The birds are placed on one side of the bin and additional boards are added as the bin is filled. The lifting activities involved in this task can be physically difficult for some growers. An alternative design is to use swinging gates on these bins, which a grower can easily open and close.



Figure 5: A typical compost bin, which requires the lifting of heavy boards to place dead birds within.

Continued on page 8

March 2005

Delaware - Maryland AgrAbility Project

The Delaware-Maryland AgrAbility Project (D-MAP) began in 1998 by serving all farmers, poultry growers, loggers, and watermen in Delaware and the Eastern Shore counties of Maryland (those nine counties east of the Chesapeake Bay). The initial project was a partnership of the Universities of Delaware and Maryland Cooperative Extension Services and Easter Seals of Delaware and Maryland's Eastern Shore.

By 2002, it was evident that the project needed to expand to the area west of the Chesapeake Bay and serve all 23 Maryland counties. The project today is composed of other active partners including the Centers for Independent Living (CILS) in Maryland and Delaware State University.

The Eastern Shore counties of Maryland and Southern Delaware include numerous poultry farms. The poultry industry drives the economy and farming is a way of life on the Delmarva Peninsula. The proximity of the area to the Chesapeake Bay, Atlantic Ocean and other inland waterways also provides for a prosperous fishing industry including crabs and oysters. The watermen in this industry are an integral part of the agricultural climate of the area.

The partnerships within D-MAP are the strength of the project. The University of Delaware and the University of Maryland Cooperative Extension Services have a long established relationship with farmers and provides expertise on workplace modifications and assistive technology. Easter Seals provides the case management service for our clients, expertise in assistive technology, therapy services and adult day programs. CILS provide disability-based information and advocacy to the farmers in the entire project area of Delaware and Maryland and work closely with the AgrAbility Case Manager whose office is in Delaware.

In addition to the expertise offered by the six organizations that comprise D-MAP, clients benefit from the strong relationships AgrAbility has developed

with area organizations, especially with the rehabilitation services providers in both states. In Maryland, the Division of Rehabilitation Services (DORS) has utilized its Workforce and Technology Center in Baltimore, Md., to engage technical engineers who visited the farms of AgrAbility clients in Maryland and make recommendations. Their engineers are developing a special reacher for poultry growers to use in picking up dead chickens that weigh several pounds. DORS has provided funding for farm equipment and modifications to equipment.

In Delaware, the Division of Vocational Rehabilitation Services (DVR) has also played an important role in providing AgrAbility clients with the AT required on their farms. They were instrumental in assisting Brian McCahill with obtaining the Dead Bird Incinerator, a computer program and fork lift for his poultry operation.

Other groups which support D-MAP's efforts include University of Delaware student groups, FFA chapters, and 4-H clubs. The groups have participated in fundraising events for D-MAP and volunteered services for AgrAbility clients.

In 2005, D-MAP is partnering with the Mental Health Association of Delaware to provide information on mental wellness and stress for farm families. A doctoral student from the University of Delaware, who is also a clinical nurse/counselor, is working on a research project as well. This project will assess the need for education and mental health services within the agricultural community.

The University of Delaware has two poultry specialists, Bud Malone and Dr. Garret Van Wicklin who have been valuable assets to D-MAP. Although they are not AgrAbility staff members, they have each visited an AgrAbility client who is a poultry grower, completed an assessment, and made recommendations for assistive technology using their knowledge of poultry operations. ❖

Delaware-Maryland AgrAbility Project Staff



Ronald C. Jester, P.E. is the Principle Investigator for D-MAP and an Extension Safety Specialist at the University of Delaware. His duties include overall leadership of the D-MAP program, fundraising, network development and modification and design projects. He has been with the University of Delaware for 30 years and with D-MAP since it began 7 years ago.



Nancy Ranalli is the Co-Principle Investigator of D-MAP and the Director of ATRCs at Easter Seals. Her duties include overall administrative responsibilities for Easter Seals, physical therapy leadership, leadership on steering and advisory committees, and special projects. Nancy has been on the project two of her six years with Easter Seals.



Scott Rowe is a County Agent and the point of contact for the University of Maryland. He provides leadership on steering and advisory committees, and special projects as well as develops D-MAP's educational opportunities. He has worked with AgrAbility for three years since starting at the University of Maryland four years ago.



Shirl Tarbox is the CILS (Centers for Independent Living) Liaison and Director of the Eastern Shore CIL. She serves as the AgrAbility point of contact for CILS and provides leadership on steering and advisory committees, and special projects. She has worked for CILs for four years and with D-MAP for three.



John Clendaniel is a Farm Management Specialist and the liaison to Delaware State University (DSU). He serves as the AgrAbility point of contact for DSU and the chair for ag technology expos in addition to providing leadership on steering and advisory committees. He has been on the project three of his four years with DSU.



Sally Van Schaik is the Case Manager for D-MAP. She coordinates many activities of the project, conducts client visits and follow-up's, serves as the chair of AgrAbility Conference Planning Committee, and much more. She has been with AgrAbility since she started with Easter Seals six years ago. ❖

William Talley, Ph.D., is the Chair of the Department of Rehabilitation Services and the liaison to University of Maryland, Eastern Shore (UMES). He serves as the AgrAbility point of contact for UMES, provides leadership on steering and advisory committees, and special projects and hosts local area AgrAbility conferences. [No picture available.]

Delaware-Maryland AgrAbility Project
 16684 County Seat Hwy.
 Georgetown, DE. 19973
 Phone: 1-877-204-FARM (3276)
 Fax: 302-856-7303
 E-Mail: rcjester@udel.edu (Ron Jester)
 Web: <http://www.De-MdAgrability.org>

Channel composters offer a labor-saving alternative to individual bins. The compost mixtures are layered using a front-end loader in a series of long channels or alleys. This method eliminates the use of boards or gates and much of the hand labor associated with composting mortalities

Clean, double-burner incinerators (fig. 6)³ are an option for growers who have difficulty with the manual labor involved with bin composters. State regulations vary between states so prospective users should check their state regulations thoroughly. For

further information on regulations, check with your state department of agriculture.

Conclusion

There are numerous tasks involved in poultry farming that make it a physically demanding occupation. Today's technology can make it possible for farmers with disabilities or chronic health conditions to continue farming. ❖



Figure 6: An incinerator for dead bird disposal.

Special thanks to Ron Jester and Sally Van Schaik, Delaware-Maryland AgrAbility Project, for contributions to this publication.

Resources

Visit the University of Delaware Web site at <http://www.rec.udel.edu> or the National AgrAbility Web site at <http://www.agrabilityproject.org> to learn more about AgrAbility, evolving technologies, and the location of AgrAbility projects in your area.

References

1. USDA. No date. Trends in U.S. Agriculture - Broiler Industry. Washington, D.C.: USDA National Agricultural Statistical Service. Available at: <http://www.usda.gov/nass/pubs/trends/broiler.htm>. Accessed 23 March 2005.
2. Dozier, W. A., M. P. Lacy, and L. R. Vest. 2001. Broiler Production and Management. Athens, Ga.: University of Georgia College of Agricultural and Environmental Sciences. Available at: <http://pubs.caes.uga.edu/caespubs/pubcd/B1197.htm>. Accessed 23 March 2005.
3. Van Wicklin, G. L. and R. C. Jester. 2005. Assistive Technology and Workplace Modifications for Poultry Growers with Disabilities (Technology Facts TF-1). Georgetown, Del.: University of Delaware Cooperative Extension. Available at <http://www.agrabilityproject.org/assistentech> Accessed 16 March 2005.

NOTE: Mention or display of a trademark, proprietary product, or firm in text or figures does not constitute an endorsement by the U.S. Department of Agriculture, Easter Seals, the University of Wisconsin, or the AgrAbility Project, and does not imply approval to the exclusion of other suitable products or firms.

The **AgrAbility Project** promotes success in agriculture for individuals with disabilities and their families through on-site assistance and educational resources. For additional information on the **National AgrAbility Project** or for a current list of state project sites, addresses and telephone numbers contact:

University of Wisconsin - Cooperative Extension
460 Henry Mall
Madison, WI 53706
866-259-6280 or 608-262-5166

Easter Seals, Inc.
700 Thirteenth St., NW, Suite 200
Washington, DC 20005
800-914-4424 or 202-347-3066

<http://www.agrabilityproject.org>

The AgrAbility Project is administered by the U.S. Department of Agriculture CSREES. Funding for this document was provided under project number 2004-41590-01880.