JUNE 18 – 22, 2007
The Summer Agricultural Institute is a program of the University of Arizona Cooperative Extension, Maricopa County.

It is funded by the Arizona Foundation for Agricultural Literacy through generous donations from individual members and organizations:

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University of Arizona Cooperative Extension, Yuma County
University of Arizona Maricopa Agriculture Center
USDA Arid Lands Research Center
Wellton-Mohawk Irrigation District
Yuma County Farm Bureau
Yuma Fresh Vegetable Association
Arizona Grown

An agriculture commodity is something grown on a farm or a ranch. Milk, oranges, beef and cotton are agriculture commodities. This map shows all the major commodities grown in Arizona’s 15 counties. There are 7,500 farms in our state.

Source: 2001 Arizona Agricultural Statistics Bulletin
www.nass.usda.gov/az/
Monday, June 18 (Jeannette Fish and Sarah Brown)

Morning Sites

7:00 am  Registration/continental Breakfast  
*Hosted by Dairy Council® of Arizona*

(A) UA Cooperative Extension, Maricopa County  
4341 E. Broadway, Phoenix

7:30  Welcome/Introductions/AG Quiz

9:00  B  Anderson-Palmisano Farms – Oliver Anderson  
35840 W. Farrell Rd., Maricopa

10:15  C  Shamrock Farms – Debbie Downs  
40034 W. Clayton, Stanfield

12:00 pm  Lunch  
*Hosted by Dairy Council® of Arizona*

12:45  D  Pinal Energy/Ethanol Plant – John Skelly, Brian Pasbrig  
38585 W. Cowtown Rd., Maricopa

1:30  Depart
Monday
Morning Map
Monday, June 18  (Jeannette Fish and Sarah Brown)

Afternoon Sites

3:45 pm  A  McElhaney Cattle Company – Mike Sulpizo
          34673 E County 9th St, Wellton

5:00  Depart for Yuma

5:30  B  Hotel Check-in – Best Western
       1450 South Castledome Avenue, Yuma

6:30  C  Dinner at Booth Machinery
       6565 E. 30th St., Yuma

*Hosted by Arizona State Cowbelles, Inc.*
Welcome from Yuma Mayor, Larry Nelson
Misconceptions of Agriculture – Jeannette Fish
***NOTES***
***NOTES***
Tuesday, June 19  (Peggy Jo Goodfellow)

6:30 am  Breakfast at hotel - Best Western
         1450 South Castledome Avenue, Yuma

7:00  Depart

7:45  A  Coronation Peak Farms – Tyler Otto
      County 10 and Avenue 28E, Wellton

10:30  B  Dole Salad Plant – Dan Doyle
       3725 S. Avenue 3E, Yuma

11:30  C  Booth Machinery – Harold Maxwell
       6565 E. 30th St., Yuma

12:00 pm  Lunch at Booth Machinery
          *Hosted by Yuma Fresh Vegetable Association*
          Rick Rademacher - President

1:15  D  Date Pac – Dave Nelson
      2575 E. 23rd Lane, Yuma

2:15  E  Select Seed of Arizona – Louis and Michael Didier
      14260 S. Avenue 3E, Yuma

2:50  Depart for Hotel

3:00  F  Farm Family pick-up – Best Western Hotel
      1450 South Castledome Avenue, Yuma
Tuesday’s Map

20 Miles East
The 2007 Summer Ag Institute would like to thank all the families who hosted teachers and gave them an opportunity to experience a taste of real life in the agricultural community.

Ernesto Amado
John & Alice Boelts
Bob & Cheryl Harman
Marvin Marlatt
Bruce & Sari McLaurin
Louis Didier
John & Mary Jean Klingenberg
Marcos & Cindy Moore
Mike Rust
David & Melissa Sharp
Clyde & Vicki Sharp
Mark & Karen Spencer
Jose & Laura Solorzano
***NOTES***
**Wednesday, June 20** (Brett Cameron)

8:30 am  **Meet at Hotel** – Best Western  
1450 South Castledome Avenue, Yuma

9:00  **Depart**

9:15  **UA Cooperative Extension**, Yuma County – Kurt Nolte  
Session on Precision Agriculture – GPS Fieldwork  
2200 W. 28th St., Yuma

10:45  **Wellton-Mohawk Irrigation & Drainage District**  
Charlie Slocum, David Sharp  
30570 Wellton-Mohawk Drive, Wellton

12:30 pm  **Lunch** / on the bus

3:00  **Desierto Verde Nursery** – Susan Chase  
Old US Highway 80, north of I-8

5:30  **Hotel Check-in** – LaQuinta  
15241 S. 50th St., Ahwatukee

6:30  **Dinner** – Cracker Barrel (walking distance from hotel)

*Optional:* Activities Development and FFA Presentation in Conference room at hotel
Wednesday’s Map
***NOTES***
***NOTES***
Thursday, June 21 (Victor Jimenez and Ed Minch)

7:30 am  Breakfast at hotel

8:30  Depart

9:00  A  U of A Maricopa Agriculture Center – Victor Jimenez, Bob Roth

9:50  Insect Management & Collection – Ed Minch

10:35  Siphon Tube Experience – Victor Jimenez

11:05  Gila River Community Project – Sonny Nieto

11:35  Project WET – Charlene Saltz

12:15 pm  Lunch

1:00  Insect Science (Group A) – Al Fournier

Plant Science (Group B) – Ed Minch

1:40  Insect Science (Group B) – Al Fournier

Plant Science (Group A) – Ed Minch

2:20  MAC Ag-Ventures & Ag Jeopardy – Victor Jimenez

3:00  Tour USDA Arid Lands Research Center – Dave Dierig

3:30  Depart

4:15  B  Return to Hotel - LaQuinta

15241 S. 50th St., Ahwatukee

6:10  Depart

6:30  C  Sponsor’s Banquet – SRP’s PERA Club

1 E. Continental Dr., Tempe

9:00  D  Return to Hotel – LaQuinta
Thursday’s Map
***NOTES***
**Friday, June 22** (Monica Pastor)

7:30 am  **A**  **Breakfast** at Hotel – LaQunita  
15241 S. 50th St., Ahwatukee

8:00  **B**  **Depart** for **Phoenix Zoo** / Stone House Pavilion  
455 N. Galvin Parkway, Phoenix  
Hosted by Arizona Milk Producers

8:30  **Curriculum Incorporation** – Monica Pastor  
University of Arizona, AG Literacy

11:00  **C**  **Depart** for UA Cooperative Extension, Maricopa County  
4341 E. Broadway, Phoenix

11:30  **Arizona Department of Agriculture** –  
Jack Peterson, Associate Director

12:00 pm  **Lunch** and **Organizational Displays**

2:00  **Wrap up / Evaluation / Discussion**

2:30  **Adjourn**
Friday’s Map
***NOTES***
***NOTES***
### Friday Exhibitors

<table>
<thead>
<tr>
<th>Organization</th>
<th>Address</th>
<th>Contact Info</th>
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<tr>
<td>ADHS Office of Nutrition Services</td>
<td>150 N. 18th Ave, Ste # 310 Phoenix, AZ 85007</td>
<td>602-542-2827</td>
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<tr>
<td>Arizona Beef Council</td>
<td>1401 N. 24th St. Phoenix, AZ 85008</td>
<td>602-267-1129</td>
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<td>Arizona Farm Bureau</td>
<td>P.O. Box 9000 Higley, AZ 85236</td>
<td>480-635-3609</td>
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<td>Arizona Nursery Association</td>
<td>1420 West Broadway, Ste 110 Tempe, AZ 85282</td>
<td>480-966-1610</td>
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<td>Arizona State Parks</td>
<td>1300 W. Washington Phoenix, AZ 85007</td>
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<tr>
<td>Casa Grande Valley Cotton &amp; Agriculture Women</td>
<td>P.O. Box 12730 Casa Grande, AZ 85230</td>
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<td>Central Arizona Project</td>
<td>23636 N. 7th St. Phoenix, AZ 85024</td>
<td>623-869-2134</td>
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<td>Dairy Council of Arizona</td>
<td>2008 South Hardy Drive Tempe, AZ 85282</td>
<td>480-966-7211</td>
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<td>Junior Master Gardeners</td>
<td>4341 E. Broadway Rd. Phoenix, AZ 85040</td>
<td>602-470-8086</td>
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<td>Maricopa County Farm Bureau</td>
<td>4001 E. Broadway Rd., Ste B-9 Phoenix, AZ 85040</td>
<td>602-437-1330</td>
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<tr>
<td>National Agricultural Statistics Service</td>
<td>230 N. First Ave, Ste # 303 Phoenix, AZ 85003</td>
<td>602-280-8850</td>
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<tr>
<td>The Phoenix Zoo Education Programs</td>
<td>455 N. Galvin Parkway Phoenix, AZ 85008</td>
<td>602-286-3859</td>
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Resources and News Articles
Economics of Arizona Agriculture

The University of Arizona has conducted studies on the economic impact of agriculture in the state. As you may know these numbers tell a story about the growth of agriculture between 2000 and 2004. The economic impact was estimated at $6.6 billion, $9.0 billion, and $9.2 billion for 2000, 2002, and 2004 respectively. These figures represent the direct, indirect and induced effects, totaling economic impact.

Although these numbers provide a story for the state as a whole, we have taken the numbers one step farther. The nature of the University of Arizona's model does not provide for a breakdown of the economic impact by county but by incorporating the findings from U of A with statistics issued by NASS we were able to come up with a formula for determining the economic impact by county. By taking the total cash receipts provided for the State by NASS and dividing them by the total economic impact finding, a correlation was found between the two studies. That multiplier was 2.819 in 2000, 2.855 in 2002 and 2.906 in 2004.

Mathematically, these figures are very close. Although these numbers will be less accurate when applied to counties (direct, indirect, and induced effects will be different, for example, in Yuma County than they are in Cochise County), we can still derive estimates for the economic impact of agriculture by county. In the table above we have collected all cash receipts for each county as well as government payments made to each county through FSA and NRCS. By multiplying total receipts by 2.906 we determined the economic impact by county for 2004, the most recent year available. Remember these figures are only estimates and should be treated as such.

<table>
<thead>
<tr>
<th>County</th>
<th>Cash Receipts*</th>
<th>FSA Payments**</th>
<th>EQIP Payments**</th>
<th>Total Receipts</th>
<th>Total Economic Contribution***</th>
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<td>$14,496,000</td>
<td>$823,706</td>
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<td>$836,778</td>
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<td>$3,055,602,000</td>
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<td>$1,957,410</td>
<td>$3,146,956,110</td>
<td>$9,145,092,234</td>
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* Information from NASS 2004 Arizona Agricultural Statistics Bulletin
** 2004 Government Payments
*** Total receipts multiplied by 2.906
The Arizona State Cowbelles is a unified, professional organization made up of generations of Arizona women playing a vital role in the state's cattle industry. The organization got its start in 1939 when a group of ranchers' wives in the Douglas area formed a social club to cement good will and friendship among the wives and mothers of cattlemen in southeast Cochise County. The women named their organization "The Cowbelles." The club immediately began doing charitable work.

Word of the unique organization spread quickly. The Wyoming State Cowbelles was formed in 1940. Texas women also asked permission to organize their own state Cowbelles. The Arizona State Cowbelles was formally organized in January 1947, during the annual convention of the American National Cattlemen's Association in Phoenix. Mattie Cowan, president of the original Cowbelles in Douglas, was elected the first state president. A total of 16 local Cowbelles groups have been organized around the state.

Over the years, the Cowbelles have turned their primary focus to beef promotion and public education about the nutritional value of beef and the lifestyle of ranch families. Arizona Cowbelles work hand in hand with the Arizona Beef Council to bring the message of ranching and the beef industry to their local schools, communities, and businesses.

Find out more about the Cowbelles’ Scholarship Program.

Find out how to contact the Cowbelles’ Officers and Local Presidents.
HISTORY OF THE
ARIZONA CATTLE INDUSTRY

The cattle industry has been a vital part of Arizona for over 300 years. In the mid-1700's Father Kino introduced cattle into our state. For almost a century cattle flourished in the arid climate, providing early American immigrants, Indians and Spaniards with beef. The marauding Apache Indians were pacified with gifts and rations. However, after the commencement of hostilities between the U. S. and Mexico in 1846, Spanish support ceased and the ensuing Indian uprising drove miners and ranchers southward, away from Apache land.

As haciendas were abandoned, great numbers of beef animals spread throughout the hills and canyons to roam in a truly wild state. Military brigades that passed through the area commented on the huge herds of cattle and horses that grazed the Arizona ranges. They were surprised that although the grama grass on the hills was straw-colored and dead looking, the thousands of wild cattle and horses were fat.

The discovery of gold in California in 1849 created a great beef market. Still, the local industry did not revive until miners came to reopen old Spanish workings and prospect new fields. The first actual rancher in Arizona is said to be William S. Oury. He began with 100 Illinois heifers and four bulls in 1858.

After the Civil War there was a tremendous stimulus to the livestock business. Unattended herds in Texas had increased while the range had declined, creating a desperate rush to relieve the overburdened grazing lands. Hundreds of discharged Texas veterans poured into Arizona. They entered Arizona four different ways: the San Pedro River, Ft. Bowie, the San Francisco River and Beale's Road (Highway 66 and the Santa Fe Railroad route).

As the number of cattle in Arizona grew, so did competition. The ranching industry adopted more business-like methods including better blood in the herds and planned use of forage. Colonel H. C. Hooker is credited with bringing a large number of Hereford cattle to Arizona in 1884. However, Colin Cameron, established near Patagonia, ran a small group of the English breed in 1883. That winter Arizona experienced severe weather hardships, but the cattle not only survived, they were in good condition in the spring. Unrivaled rustling ability, early maturing qualities and prolific reproduction soon placed the Hereford breed in a favored position on the Arizona range.

The last years of the decade ending in 1890 were truly the heyday of Arizona's range cattle industry. Many an indolent man with money to invest must have been attracted by the imagery that claimed: "here the climate is almost perpetual spring and even in the driest season the feed never fails and the owner can sit under the shade of his comfortable hacienda and see his herds thrive and increase in winter and summer."

In 1890 practically every acre of range was being occupied. Unofficial estimates by experienced ranchers showed 1,500,000 cattle located on the Arizona range. However, overstocked lands and three years of drought beginning in 1891 produced catastrophic conditions for the cattle industry.
Located at the northern end of Sulphur Springs Valley, Willcox began its existence in the late 1870s as a railroad construction camp named Maley. The Southern Pacific Railroad began building a line across southern Arizona at Yuma and the first train had arrived in Tucson by March of 1880. The railroad reached Maley later that month.

The name of the town was changed to Willcox in honor of General Orlando B. Willcox who was on the first train to arrive at the station. General Willcox was well known for his military operations against the Indians as commander of the 23rd Infantry at Fort Bowie from 1877 to 1882.

By October 1880, Willcox had rapidly grown from a collection of tents with dirt floors to a permanent town of adobe and frame houses. The town was located in the center of one of the best grazing areas in Arizona and was fortunate in having a supply of water so near the surface that a well could easily be dug with a pick and shovel. It was reported that by 1884, Willcox had a population of 500 people.

The coming of the railroad to the area was a greater incentive to the growth of the cattle business, providing easy transportation to outside markets. By 1896, Willcox led Tucson in the number of cattle shipped that year and remained a leading cattle shipping point for many years. By 1936, Willcox was dubbed the “Cattle Capitol of the Nation”, shipping more cattle directly from the range than any other shipping point in the United States.
Wellton-Mohawk Irrigation and Drainage District

Wellton-Mohawk Irrigation and Drainage District (District) was created by an act of the Arizona State Legislature on July 23, 1951. It was organized to provide a legal entity which could enter into a contract with the United States to repay the cost of this irrigation and power project, and to operate and maintain the project facilities. Congress authorized the irrigation features on July 23, 1947 as the Wellton-Mohawk Division of the Bureau of Reclamation’s Gila Project. President Truman signed that legislation into law on July 30, 1947.

Construction work started in 1949, and the first water was delivered to fields in 1952. Wellton-Mohawk Irrigation and Drainage District, as a legal entity, assumed operation of the first-completed features of the irrigation works in 1953.

Currently the District is comprised of approximately 58,200 irrigable acres in the valley and 4,550 acres on the mesa, for a total of 62,750 acres irrigated.

In addition to being the water provider for the area, the District is also the electric utility responsible for delivering reliable electric service to the towns, scattered residences and the agricultural community. The power distribution facilities date from 1921 and were taken over by the District upon its legal formation in 1951.

The products produced by the agriculture in the area contribute well over $200,000,000 to the annual economy of the area. The crops grown include iceberg lettuce, romaine lettuce, purple cabbage, green cabbage, baby spinach, baby lettuce, broccoli, cauliflower, cantaloupe, watermelon, alfalfa, wheat, cotton, corn, Sudan grass and Bermuda grass. Many specialty crops are grown for seed such as, artichokes, broccoli, and cauliflower. There are several livestock operations in the area with one of the largest being McElhaney Cattle Company. There are also a couple of dairy operations here. In the winter sheep are brought down from the high country to graze, get sheared and have their lambs.

The Wellton-Mohawk Irrigation and Drainage District is the foundation on which all activity in the area is based. The water brought in by the District has made this area one of the most productive agricultural areas in the State of Arizona and the western United States. So when you are enjoying a cool slice of watermelon, a tasty, healthy salad, a wonderful steak or just a cool glass of milk, remember, that any one of these products may have been produced in the Wellton-Mohawk area for your pleasure.
Biotech cotton offers protection against pest

Farmers say genetically modified seeds help guard state's crop by keeping bugs at bay.

Ken Alltucker
The Arizona Republic
Feb. 6, 2007 12:00 AM

Americans are distrustful when scientists begin tinkering with the food supply by altering crops or cloning animals.

But the practice of planting biotech crops is widespread in Arizona and elsewhere.

Arizona's main foray into biotech agriculture is the use of a modified cottonseed designed to wipe out a pest that some say once endangered the state's cotton crop. The genetically modified seed, known as Bt Cotton, has improved cotton yields and nearly eradicated the pink bollworm.

"In my opinion, it probably saved the cotton industry in the state of Arizona," said Bruce Heiden, who owns a farm in Buckeye. "In our farming operation, genetically engineered plants and seeds have removed tons and tons of pesticides. I have been fighting all my life to make pesticides available. Now we're going to learn to live without them, and that's safer for the environment."

That's the argument farmers across the United States use as they switch to biotech crops. Those involved in agriculture tout the use of such crops as a way to use fewer pesticides and improve yields. Farmers increasingly are turning to biotech crops to grow cotton, corn, soybeans, alfalfa or other crops.

U.S. farmers have led a worldwide charge for the use of such crops. U.S. farms account for 135 million of 252 million acres of biotech crops planted worldwide in 2006, according to the International Service for Acquisition of Agri-biotech Applications.

Debate over altered crops

Even as more farmers plant such crops, a recent survey shows that Americans aren't aware that corn, alfalfa, processed foods or other foods found on supermarket shelves have been altered at the genetic level.

"Most people don't understand the extremes that commodity crops are genetically engineered," said Michael Fernandez, executive director of the Pew Initiative on Food and Biotechnology. Fernandez said public opinion over the use of such farming methods is up for grabs.

"There's a relatively small number of people who are strongly opposed and a small amount in favor," of biotech crops, Fernandez said. "Most people fall somewhere in the middle. Their opinions are not firmly held."

That's not the case with using cloned animals for food. Almost two-thirds of people (64 percent) say they are uncomfortable with the idea of cloning animals, according to a survey last year by the Pew Initiative.
Nevertheless, the Food and Drug Administration is expected to declare this year that meat from cloned cows, pigs and other animals is safe to eat.

The cloned animals likely will not be used as food because of the expense. Rather, farmers likely will clone their most desirable animals and use the meat and dairy products from the cloned animals' offspring.

Vicki Chandler, director of the Bio5 Institute in Tucson, said each biotech product must be evaluated on a case-by-case basis.

“"You need to take a look at the product and evaluate the safety from there," said Chandler, who cited cotton as productive use of biotechnology for plants.

Battling persistent pests

Heiden said he was skeptical about using biotech seeds on his family farm in Buckeye.

At the height of the pink bollworm invasion, Heiden said he would spray insecticides as often as 15 times a year. He worried that a modified seed would not curb the need for spraying pesticides and would end up costing a bundle.

"We're always skeptical of something until we have a chance to try it," said Heiden, a second-generation farmer who has been working the fields of his family farm, H-Four Farm, since the 1950s.

He has become a convert. Crop sprayings have dwindled to just a handful each year to ward off other pests and weeds.

The National Cotton Council of America estimates that pink bollworm cost cotton producers as much as $32 million in lost yields and related costs. Those lost crops have been all but eliminated under the pink bollworm eradication plan, a federally funded program targeting the bollworm in Arizona, California, New Mexico, Texas and parts of northern Mexico.

Bt Cotton is genetically modified to grow a natural insecticide known as Bt toxin. The modified seeds, engineered by St. Louis-based Monsanto Co., are made with a bacterium whose gene is placed into cottonseeds that resist bollworms.

Environmental groups abroad, particularly in the European Union, have assailed the use of Bt Cotton over fears that the modified cotton could develop resistance to antibiotics and prove harmful to humans. Those fears have not materialized, according to Bruce Tabashnik, head of the University of Arizona's entomology department.

"It is probably the most closely watched (eradication) program in the world. The resistance has not increased," Tabashnik said.

Farmers throughout the state now routinely plant the seed as part of the effort to get rid of the pest.

Wiley Murphy, who farms 500 acres in southern Arizona, said his entire farm is planted with biotech seeds. Just a few years ago, he would spray five or six times a year to fight off pink bollworm. That has been reduced to about once a year.

He said Arizona's use of biotech seeds won't restore cotton as one of the staples of Arizona's economy. The state's production has waned over the years as farmers increasingly sell valuable land to developers.

But he said the use of modified seeds allows cotton farmers to maximize production while avoiding the harmful effects of pesticides.

"Environmentalists should be happy with this," Murphy said. "I don't know of a single case where it has been harmful."
Shortage of workers imperils Yuma crops

Farmers point to lack of guest-worker law

Daniel González
The Arizona Republic
Nov. 21, 2006 12:00 AM

YUMA - C.R. Waters practically lives in his pickup now that harvest season has begun for the winter vegetable capital of the United States.

As the farm manager for a major vegetable distributor, he makes sure everything from iceberg lettuce to broccoli is ready to pick at precise times throughout the season.

"This one should be ready the first week of January," Waters said one recent morning, stepping out of his pickup into a field of romaine lettuce.

So far, good weather has created ideal growing conditions, but Waters is worried that when the vegetables are ready, there won't be enough laborers to get crops to market.

Waters, president of the Yuma Fresh Vegetable Association, said it will take 30,000 seasonal workers to harvest the sea of winter vegetables grown in Yuma County, where the fruit-and-vegetable crop was valued at $745 million in 2004. The area produces 90 percent of the winter vegetables consumed in the U.S. and Canada, and 98 percent of the iceberg lettuce.

If growers can't find enough workers, some crops may go unpicked. That could hike prices at the supermarket and create substantial financial losses for farmers.

Last year, however, some growers overproduced, so prices stayed low even though some labor contractors reported a 30 percent shortage of workers.

In other parts of Arizona, pepper farmers and others struggled to hire enough hands, as well. Yuma growers won't know how severe the labor shortage will be until the harvest kicks into high gear just after Thanksgiving. To hedge their bets, they planted 15 percent fewer acres this year.

Labor scarcities are common in the agricultural industry: Picking vegetables by hand stooped under the hot sun is tough, backbreaking work.

But growers and farm advocates say the shortages, even with thousands of legal Mexican laborers, have become more severe as stricter immigration enforcement, tighter border security and increased competition from construction and other industries have shrunk the pool of seasonal workers.

The shortages are not just limited to the Yuma region. Vegetable growers in Colorado, pear growers in northern California, and apple growers in Washington, all have lacked workers.

Many growers blame conservatives in Congress for failing to pass legislation that would have expanded a guest-worker program for agriculture. If the labor troubles continue, they warn, more growers will move crops to Mexico and other countries with access to cheap labor.
In the meantime, the harvest season has created a sense of urgency in Yuma.

"You can have the best crop in the world, but if you don't have the labor to harvest it, it's going to rot in the field," Waters said.

Workers harder to find

Situated between the Coloradoand Gila rivers, Yuma is blessed with fertile land and abundant water.

Because of its proximity, 20 miles from the Mexico border, Yuma also has what few other agricultural regions do: access to a large pool of legal immigrant workers like Jose Navarro, 45, and Martin Contreras, 32.

They are among the thousands of Mexicans who have gained U.S. citizenship or legal permanent residence but live across the border in San Luis Rio Colorado, Mexico, where the cost of living is cheaper than in the U.S.

Every day during harvest season, they stand in long lines for two hours or more to pass through the U.S. port of entry in San Luis, Ariz., where customs agents in blue uniforms examine their documents.

At 4:30 one morning in the predawn darkness, the town's main street was already alive. Thousands of farmworkers in hooded sweatshirts and wide-brimmed hats filled the sidewalks on the Arizona side. Navarro and Contreras stopped at a taco stand to buy last-minute coffees and burritos before climbing onto one of the dozens of old school buses idling in parking lots, waiting to transport workers to the fields.

From the border, Navarro and Contreras still faced an hour and a half bus ride to work on a thinning crew near Wellton, east of Yuma. On the way, they would pass through a Border Patrol checkpoint on Interstate 8, where agents would climb onboard and check their documents again.

Navarro and Contreras said they would earn $6.25 an hour that day working the lettuce fields.

During the harvest, lettuce pickers earn a base pay of $8 an hour, plus bonuses the faster they pick. The best lettuce pickers can earn as much as $12 to $14 an hour.

For years, these workers have served as the backbone of the labor force in Yuma. But many farmworkers, drawn by steady jobs that often pay better, have left the fields to work at housing developments and construction sites sprouting up around Yuma.

The long waits to cross the border also are driving workers to leave farmwork, while the increased presence of Border Patrol agents has scared some already in the U.S. away from Arizona.

In the past, migrant farmworkers, including many undocumented immigrants who get jobs with fake papers, followed the harvest from California to Arizona and back. Rather than risk arrest passing through Border Patrol checkpoints that ring Yuma, many migrants avoid the state.

"In the past, there were a lot of undocumented doing this work, but now there is so much border enforcement," said Gladys Sanchez, a lettuce crew foreman for Valley Pride, a vegetable harvester in Yuma.

Tighter enforcement

Yuma became a hotspot for illegal immigration after tighter border security in eastern Arizona and California squeezed traffic through the area.

On a recent tour, Border Patrol Agent Maranda Weber maneuvered an SUV through unpaved desert roads south of Yuma. On one side was the U.S.-Mexican border, on the other, thousands of acres of crops.

As the vehicle bumped along, she pointed out new measures to try to reduce illegal immigration. Along a levee, National Guard troops stationed every half-mile stood watch for signs of human smuggling and drug trafficking.
Farther south, Weber drove alongside new triple-layer fencing and glinting metal tube barriers that stop smugglers from driving vehicles across the border.

In the past year, the Border Patrol also doubled to 551 the number of agents assigned to the Yuma Sector. An additional 200 are on the way. The buildup is having an effect, the Border Patrol says. Arrests for fiscal 2006, which ended Sept. 30, declined 14 percent, to 118,549 from 138,438, the year before.

"As we gain more operational control, they (smugglers) are seeking other routes," Weber said.

No solution in sight

Waters said growers welcome the increased border security. Most migrants crossing illegally near Yuma are headed to other parts of the country and don't seek work in the area's fields.

This week, customs officials will open four pedestrian crossing lanes at the San Luis port of entry, increasing the number to six, Levin said. The new lanes, plus two temporary lanes that can be opened as needed, should alleviate the long waits for workers.

Some experts say growers would have less trouble finding workers if they paid more. But growers such as Doug Mellon, 61, scoff at that notion. With unemployment low, there simply aren't enough workers, he said. On top of that, most Americans shun farmwork.

"I don't care if you paid $40 (an hour), they'd do it about three hours and say, 'That's not for me,'" Mellon said.

Many growers say the long-term solution is an expanded guest-worker program for agriculture. Earlier this year, the Senate passed comprehensive immigration reform, legislation that included a provision known as AgJobs, which would have created a new temporary-resident status for seasonal farmworkers and given long-term farmworkers a chance to apply for permanent residence.

During negotiations in Congress this year, Yuma farmers offered to test a scaled-down version that would have allowed Mexican workers to commute daily across the border with temporary work visas.

Conservative Republicans in the House, however, refused to consider comprehensive immigration reform, angering growers, who tend to vote Republican.

Now, growers hope the new Democrat-controlled Congress will revive guest-worker legislation next year.

As for this year's harvest?

"It's too late," Mellon said.
Urban growth could push Arizona farmers to Mexico

Dennis Mitchell
Cronkite News Service
Feb. 17, 2007 12:00 AM

Urban growth into Arizona’s farmland will push farmers to take part of the state’s $6.3 billion-a-year agriculture industry into Mexico, the state’s agriculture director said.

"The growers are going to go to Mexico. They’re looking there now," Donald Butler, director of the Arizona Department of Agriculture, said Thursday in an interview. "You keep pushing and pretty soon you’re going to have a situation like you do with oil. It’s going to be imported," Butler said. "The growers here are going to go to Mexico and produce the crops and send them back up."

Butler said he doesn’t see a balance developing between agriculture and the population influx that has made Arizona the fastest-growing state in the nation.

"They’re going to come, and they have to be housed someplace, whether it’s prime farmland or not," he said. "I think agriculture is going to get the short end."

Butler said that’s because the land is more valuable to a developer than to the farmer.

Arizona lost 37 percent of its farmland between 1950 and 2000 to either residential, industrial or business uses, according to a 2003 report from Northern Arizona University’s Center for Sustainable Environments.

Butler said he remembers when Arizona had 500,000 to 600,000 acres of cotton. Last year, it was around 220,000 acres, and he said he has heard it’s now around 180,000 acres.

Asked what the state could do to keep agriculture strong in the long run, Butler said, "I guess the easy answer would be to stop putting concrete down on good farmland."

Butler said his department needs to do a better job of educating people about what agriculture adds to Arizona.

"People don’t realize the effort, the capital and everything that goes into agriculture," he said. "It’s much easier to go to Safeway or Bashas or the rest."

The state is the nation’s second-largest producer of head and leaf lettuce, spinach, cantaloupes, honeydew melons, broccoli and cauliflower.

Butler said the move of farms out of the country could make it more difficult to keep food safe.

He also pointed out that any food-borne illness outbreak would be more difficult to trace in imported food.

"People say, ‘is it safe food?’ They can do things in Mexico that we can’t do here in pesticides and in other areas." Butler said.

http://www.azcentral.com/business/articles/0217biz-agmex0217.html

2/23/2007
Produce distributors are working with Mexican growers to establish safety measures for their crops, he said, adding that such corporations as Wal-Mart are demanding a specific level of safety in the food that they purchase.

Butler said Sonora is the most advanced state in Mexico in terms of livestock and crops.

"It's a lot of money, and they take care of it," he said.

Butler added, however, that the 1,500 trucks passing through the port of Nogales each day carry produce from as far away as Guatemala and Chile.

While agriculture inspectors monitor what enters Arizona, it's impossible to inspect every truck and every cargo container, he said.

He said another border issue affecting Arizona growers is the availability of labor to work in the fields.

Butler said that in some Yuma lettuce fields, for example, only 20 workers are thinning the fields when 60 workers are needed for the job.

Butler said he favors a program to bring in field workers from Mexico "because you don't have the workforce in the United States that's willing to do it."
Facility helps turn desert plants into crops

Dennis Mitchell
Cronkite News Service
Apr. 14, 2007 12:00 AM

MARICOPA - Someone driving by the Maricopa Agricultural Center might see acres and acres of unremarkable desert plants. Bob Roth, however, sees the future of desert farming.

A shrub-like plant called guayule can produce hypo-allergenic latex. Lesquerella, a small plant with yellow flowers, yields powerful oil that can be used for cooking and in pharmaceuticals. The long green stalks of hesperaloe have strong fibers that can be used in paper products.

The 2,100-acre University of Arizona facility focuses on native desert plants that can be turned into profitable specialty crops, a segment that state officials say accounts for 35 to 40 percent of Arizona’s $9.2 billion agriculture industry.

“When I think of specialty crops, I think of new crops,” said Roth, the center’s resident director.

According to the U.S. Department of Agriculture, the total value of specialty crops in the United States is $49 billion, which exceeds the $45.8 billion value of the five traditional program crops: corn, wheat, soybeans, rice and cotton.

Arizona is the fifth-largest specialty-crop grower in the nation, growing everything from lettuce, spinach and broccoli to cantaloupes, grapes and gourds.

The state is a prime location for specialty crops because the climate allows for year-round production, according to Ed Hermes, public information officer for the state Department of Agriculture.

The center’s research goes beyond traditional specialty crops such as vegetables, fruits and nuts; it researches desert plants that can be grown only in certain arid climates such as Arizona’s.

“We’ve taken crops that have adapted to this region, and that’s what we are working with. We didn’t choose a crop from Alaska,” Roth said.

One particularly successful plant is guayule (pronounced why-YOU-lee), which Yulex Corp., based in Carlsbad, Calif., uses to make latex and rubber.

“It could be a very big boost to (Arizona’s) economy, and it could be very important to the medical industry,” Roth said.

In 2004, Yulex opened the first commercial plant to produce natural rubber in the United States at the Maricopa Agricultural Center. Last month, the company announced that it will sell the bio-based latex it makes from guayule to a medical-device manufacturer that will use it to produce hypo-allergenic catheters.

“The market and demand for this material in the medical industry is enormous,” Yulex spokeswoman Betsy Bratlund said.
The center has been researching guayule for nearly 30 years, Roth said. Guayule research began during World War II when the government was afraid of losing access to natural rubber, which is imported from Southeast Asia. Much of the original research was done in Yuma, Roth said.

Researching new crops can take decades to reach the point at which a crop can become profitable for farmers, Roth said.

The other two plants grown at the center are promising, according to Roth, but they have not yet reached the level of success of guayule.

Lesquerella’s pea-size pods reveal tiny seeds that can be crushed to make an oil that Roth said is like ”castor bean oil on steroids.” Castor bean oil is used in a wide variety of products, from cooking oils to pharmaceuticals.

The center also researches the potential of hesperaloe’s strong fibers, which can be used to create paper products.

“The fiber quality exceeds anything we’ve seen today,” Roth said, tying a long strip off one stalk in a knot to demonstrate the plant’s strength.

Specialty crops have received national attention in recent months after U.S. Agriculture Secretary Mike Johanns announced a proposal in the 2007 farm bill that includes nearly $5 billion in funding for specialty-crop assistance, marketing and research.

“Forever you’ve had a federal farm policy that’s ignored specialty crops,” said Paul Simonds, Western Growers Association communications manager. “Specialty growers are not looking for subsidies or handouts. Specialty-crop growers are interested in investment by the government.”

A major part of the proposal will seek to have the government purchase more fruits and vegetables to support public food-assistance programs. But another significant portion of the proposal, $1 billion over 10 years, will fund specialty-crop research.

The state Department of Agriculture announced last month that it has about $260,000 in grant money to award to specialty-crop producers who undertake projects aimed at increasing specialty-crop consumption and competitiveness.

Tim Dunn, vice president for the Arizona Farm Bureau, said that funding research is a key to helping the specialty-crop industry. Specialty crops will play a larger role in the future, he said.

“As farmers diversify, specialty crops will be a larger portion of their net income,” Dunn said.
Farmers in California and Arizona with parched wallets are eyeing a dangling carrot that could lead to improved grower incomes for those willing to produce specific feed grains to meet the insatiable needs of the nation’s exploding ethanol industry.

In the West, grower opportunities range from planting flexible corn hybrids that yield high-quality silage for dairies as well as corn for ethanol — to foregoing cotton production for corn and grain sorghum.

Monsanto Seeds System Manager Bill Cox of Visalia, Calif., said California corn for silage growers are seriously weighing their options due to lower silage prices in recent years versus escalating corn prices.

"On the scale of one to 10, I’d say the grower interest out there is between 5 and 6," Cox said. "Growers are very serious about growing a hybrid that yields great silage plus corn for ethanol as well. California corn growers have typically grown about 75 to 80 percent of the crop for silage and the remaining 20 percent for grain." He said some corn varieties currently on the market can grow both while some cannot.

For cotton growers contemplating the switch to feed grains, prices dictate the rationale. March ‘07 corn futures on the Chicago Board of Trade topped $3.74 a bushel on Dec. 1.

In 2004, corn prices were in the dismal $2 range. The price run-up is largely tied to the rush to grow corn, grain sorghum (milo), and other crops to fuel an estimated 100 ethanol plants already in production in the United States. An estimated 35 more plants are under construction.

What price level could push Western cotton growers to make the change to feed grains?

"To switch away from cotton, $7 per hundredweight for sorghum gets growers’ attention, which is about where sorghum prices are right now, $10 per hundredweight could be the breaking point," said Mike Ottman, feed grains specialist with the University of Arizona. "I can imagine cotton growers having a mix (cotton and feed grains) but to fully give up cotton is hard to imagine," he said. Ottman pointed to the huge capital investment cotton farmers have in planters and pickers.

Yielding Arizona cotton acres to feed grains is the goal of John Skelley, president and general manager of Pinal Energy LLC. The company is constructing the first ethanol plant in Arizona, a $62 million facility located near Maricopa about 30 miles southwest of Phoenix.

With fuel production scheduled to begin in May 2007, the plant will produce 52 million gallons of ethanol annually. The 18 million bushels of corn required annually to run the plant will initially be railed in from the Midwest. Pinal Energy will purchase the corn from its sister company, Arizona Grain. The corn will arrive weekly on a 100-car shuttle train. Down the road Skelley wants locally grown grain to fuel the plant.

"In five years, Arizona will be producing more acres of feed grains (corn and milo) than cotton," predicted Skelley during a renewable fuels discussion at the Arizona Farm Bureau annual meeting in November in Phoenix.

Skelley is offering jobs to Arizona farmers to switch from cotton to corn and milo to fuel the plant. The facility will “suck grain like a big vacuum cleaner,” noted Skelley, using 50,000 bushels per day. He wants local production.

"This is for real. If you’re a grower out there, we want you to talk to you about growing product for this plant because it gobbles up the grain," he said. "We want to sell you distiller’s grain if you’re a dairy, and we want to buy corn or milo from you if you’re a farmer. We’re there to be your customer and for you to be our customer.”

He plans to sell the plant’s bi-product, distiller’s grain, to dairies and feedlots within a 30-40 mile radius.

As expected, the Arizona Cotton Growers Association (ACGA) was far from enthusiastic over Skelley’s plans.

ACGA Executive Director Rick Lavis said, "If he can pay my (cotton) growers enough, fine — good luck." Lavis said Arizona cotton acreage in 1980 covered 631,000 acres compared to 295,000 in 2001. Cotton acreage in 2006 was 206,000 acres.

"The amount of acreage reflects that cotton prices have not been high enough. The price is roughly 54 cents per pound right now," he said. "It takes 32 cents to 35 cents to grow it. You do the math.

Lavis noted the ethanol industry is being pushed to the point of saturation with more plants in production than the corn to sustain them.

Outside of price, could other Arizona factors such as limited water supplies impact a switch from cotton to feed grains? Cotton grower Kevin Rogers of Mesa, Ariz., said milo could work in Central Arizona but would require double cropping possibly with barley. Water used for a double crop would run about the same for cotton so water in the crop conversion would not be a major factor. Rogers serves as an ACGA vice-president.
“Unless the cotton market turns around, growers including myself will be looking at options to pay the bills. I am not one to put all my eggs in one basket,” Rogers emphasized. “We’ve grown milo off and on over the years. If the milo price was over $9 per hundredweight, I’d find a couple of hundred acres and give it a shot.”

Wet distiller’s grain (DDG) is the leftover corn product once the starch is removed through the ethanol process. The DDG is usually fed to dairy and beef cattle, poultry and swine because its high digestibility, energy and higher fat content can yield higher milk production than soybean and canola meal.

While alfalfa is a critical mainstay in the animal’s diet, could a sudden large supply of DDG on the market replace alfalfa? No, said Otman. “Alfalfa is unique. It’s hard to duplicate its ruminant function.”

In fact, he said higher grain prices tend to push up alfalfa prices. “Alfalfa prices usually follow feed grain price increases,” he said. “Higher feed grain prices may be more of a positive effect for alfalfa than a negative.”

Arizona Forage Producers Association President Lee Banning of Leavon, Ariz., grows alfalfa near Gila Bend, Ariz., and opposes a local ethanol plant in the planning stages. Ethanol West LLC and Western Milling LLC plan to break ground on the plant in 2007. But Banning doesn’t want the plant in his backyard.

“I don’t want to compete against them for labor,” said Banning. “Labor supplies are very tight. If you throw 50 more (ethanol) jobs in the area, it will drive up everyone’s cost of labor.”

Skelley is seeking legislation to expand Arizona’s current six-month mandated use of fuel containing 90 percent gasoline and 10 percent ethanol blend to the entire year. He called E85, the blend of 85 percent ethanol and 15 percent gasoline, the future of the industry, as more new cars and trucks coming on the market can burn the higher ethanol blend.

“With E85, you’ll have the choice of buying fuel that came from Venezuela or from Maricopa, Arizona. We think you’ll prefer Maricopa,” Skelley proclaimed.

He acknowledged that E85 generates 10 percent to 15 percent less mileage because of fewer generated BTUs (British thermal units). “I suspect it will be priced accordingly.” He praised ethanol as a cleaner burning fuel with fewer tail pipe emissions.

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Ethanol-Bio Fuel Plants

By Cary Blake  
Farm Press Editorial Staff  
cblake@farmpress.com

Western state ethanol production is expanding and changing the focus of agriculture in California and Arizona. With 100 plus ethanol plants in operation in the United States, most are in the nation’s Midwest.

CALIFORNIA: Two ethanol plants are in production.

Altra Inc.: California-based Altra Inc. is operating a 27 million gallon per year ethanol plant in Goshen, Calif. Altra purchased the plant from Phoenix Bio-Industries, LLC on July 5, 2006. Altra plans to expand production to 35 million gallons. The company’s goal is to acquire 500 million gallons of biofuel production through the purchase of existing assets across the nation.

Pacific Energy: Pacific Energy opened its first ethanol plant in October 2006 in Madera, Calif., producing 35 million gallons per year. Pacific Energy has a plant under construction in Boardman, Ore. According to Pacific, the goal is to bring five ethanol plants in production totaling 220 million gallons per year by mid-2008, and a total of 420 million gallons in production by 2010. Pacific's wholly owned subsidiary, Kinergy Marketing, LLC, is the largest West Coast-based marketer of ethanol.

On the drawing board:

• Ethanol West, LLC and Western Milling, LLC plan to build ethanol plants in Keyes, Calif., (near Turlock) and in Famoso, Calif. (near Delano). Each plant would produce 55 million gallons annually with the ability to double production within a year. The plants are expected to be on line in 2007.

ARIZONA: Two plants are under construction.

• Pinal Energy LLC: Pinal Energy will open its 55 million gallon, $63 million ethanol plant in May 2006 in Maricopa, Ariz. The plant will use 18 million bushels of feed grains annually. Initially, corn railed in from the Midwest will fuel the plant. Then Pinal Energy hopes to persuade Arizona farmers to grow corn and milo for the plant.

Besides the distiller's grain and ethanol by-products, the plant will yield carbon dioxide to be sold as a liquid in the Phoenix and Tucson markets, and as a dried product for the hydroponics’ industry.

• XL Dairy Group, Inc: Located just off Interstate 10 near Vicksburg, Ariz., the XL Dairy Group Inc. is currently building a bio refinery. The facility will feature three components: dairy, waste energy and bio refinery.

Stage one of the dairy is completed with the ability to expand to milk 7,500 cows. The plant’s waste energy section will create enough energy primarily through methane digestion augmented by gasification to power the dairy and the bio refinery. The third sector, the bio refinery, will produce ethanol, biodiesel and carbon dioxide.

On the drawing board:

• Agrinext Ethanol AZ, LLC plans to build a bio ethanol plant near Tacna, Ariz., next to the proposed Arizona Clean Fuels Yuma, LLC oil refinery.

• Ethanol West, LLC and Western Milling, LLC plan to break ground on a plant in Gila Bend, Ariz., in 2007.
Old food meets new technologies, leaves food for thought

March 2, 2007 - There are big changes driven by small forces in two of the oldest industries of the U.S. economy – agriculture and agricultural production.

From fields to grocery store shelves, nanotechnology – technology that allows the control of unique, sub-molecular properties of matter – is revolutionizing the way food is produced, packaged and distributed, leaving many grappling with nanotechnology's numerous implications.

Sue Selke and John Stone, from the Institute for Food and Agricultural Standards at Michigan State University, were among a group of experts who addressed questions surrounding the union of agriculture and nanotech during the symposium, "What is Agrifood Technology?: Technical, Ethical, Legal and Social Questions," at the American Association for the Advancement of Science annual meeting in February.

“It’s not just food. Everything from food-processing equipment to packaging and distribution systems are being affected by nanotechnology,” Stone said. “Applications are found throughout the supply chain.”

Selke points out that nanotechnology plays an important role in the packaging of agrifood products. For instance, the interiors of snack food packages are often coated with a shiny, nano-thin layer of aluminum.

“This aluminum layer is much thinner than a piece of tissue paper and is an effective and economically beneficial way for keeping oxygen from getting in and keeping moisture out,” Selke said.

Nanotechnology also can be helpful in selecting ripe produce. Special sensors with nanotech components capable of detecting the ripeness and freshness of packaged produce are used in stores today. The sensors work by measuring the concentrations of oxygen within the package. A marker on the exterior of the package turns color, indicating to buyers that the produce has ripened to perfection.

Similar sensors able to detect microbial concentrations growing in food, drugs and medical devices have the potential to improve safety.

Despite the potential benefits to agrifood producers, retailers and consumers, nanotechnology’s applications in the food industry are a reason for concern for many.

Stone points out that privacy and control issues associated with agrifood and nanotechnology are likely to be among several hot-button issues.

Many companies store sensitive shipping and distribution information on chips which can be scanned and loaded onto computers and rendered insecure.

There also is potential for development of small environmental testing devices containing nanocomponents that may offer ordinary citizens the chance to monitor chemicals being emitted from a nearby factory or those being used on a local farm. Such advances likely would result in changing power relationships in food and environmental politics.

“There are some people that just don’t want it because nanotechnology is associated with risk, big companies and some just don’t like new technology,” said Paul Thompson, Kellogg Chair in Agricultural, Food and Community Ethics. “People like to think of food as a warm old-fashion kind of thing.”
Thompson organized the symposium with Larry Busch, University Distinguished Professor of sociology.

Stone presented a model for public collaboration with government and industry to lay the groundwork for more socially responsive agrifood nanotechnology. He called for an approach that builds on the collective experience of extension agents interacting with community members.

In this model, extension agents receive training on potential nanotechnology applications in food and agriculture and work at a grass-roots level to link public perceptions of risk and opportunity to agrifood policy makers and other stakeholder groups, Stone explained.
Land of milk and biofuel

By Ed Taylor
Tribune

Milk and biofuel might seem an odd combination, but a Phoenix-based company is planning to produce both at a proposed dairy/biorefinery in western Arizona. When fully built, the $260 million ag-industrial complex planned by the XL Dairy Group will produce 100 million gallons of ethanol, 25 million to 30 million gallons of biodiesel fuel and 21 million gallons of milk a year.

The concept is to use waste produced by the dairy cows to make energy that would be used to turn corn into ethanol and biodiesel, said Dennis Corderman, chief executive and chairman of XL Dairy Group. Byproducts of the ethanol and biodiesel production will be cycled back to produce internal energy for the biorefinery and to provide feed for the dairy cows, he said.

"The biggest difference between us and other ethanol plants is we will use waste streams from the dairy to produce our own energy," he said. "It will provide the electrical and heat and steam energy for the entire facility."

Because the plant will supply its own power, the operation will have an energy efficiency ratio of 10-to-1, he said. That means for every one British Thermal Unit of energy put into the process - including indirect energy consumption such as fuel needed to grow corn - the equivalent of 10 units of energy in the form of ethanol and biodiesel will be produced.

Conventional ethanol plants have an energy efficiency ratio of about 1.2-to-1, he said.

One similar cow-power facility exists in the United States - the E3 BioFuels Genesis plant in Mead, Neb., which has an ethanol plant attached to a dairy/feedlot. It became fully operational a few weeks ago.

XL Dairy Group has completed construction of the first phase of the dairy on a 307-acre site near Interstate 10 and Vicksburg Road, about 100 miles west of Phoenix. The firm will move in the first of 2,500 dairy cows in about three months to begin milk production, Corderman said. Also within three months, the company plans to begin construction on the second phase of the dairy, which will eventually house about 7,500 milk cows.

It is scheduled to begin operations at the end of this year.

Then construction will begin on the biorefinery and an internal energy plant, or "energy island," with completion of both expected by the end of 2008, Corderman said.

A second phase that would more than double the output of the biorefinery could be running in about five years.

APS Energy Services, an unregulated division of Phoenix-based Pinnacle West Capital Corp., will operate the internal energy island.
The result will be an efficient process without the need for outside electricity or natural gas to produce the fuels, said Project Coordinator Michael McCloud.

"We will be tied to the utility for redundancy, and we can use electricity from the grid for the startup," he said. "But at full operation we will not need any fossil-based fuels - natural gas or coal-fired power."

Corderman estimates the efficiencies will allow the Vicksburg Biorefinery to produce ethanol about 30 cents a gallon cheaper than conventional ethanol plants.

ALGAE POWER
But Corderman believes that real efficiencies will start after the second phase goes into action. Instead of corn shipped in by rail from the Midwest, it will use algae as the feedstock to produce both ethanol and biodiesel. XL plans to grow algae on 2,400 acres of adjacent state land, using manure water, carbon dioxide produced as a byproduct of the ethanol process and sunlight.

The company will propagate algae in a patent-pending system of horizontally mounted clear tubes, Corderman said.

"We feel that we have developed and are patenting the first commercial methodology to produce algae on a large scale," he said. "There is no question about the biology and efficiency of algae to produce fuel. The problem has been doing it cost-effectively, and we think we have resolved that."

But he said it will take 12 to 18 months to prove the efficiency of the algae system and another three years to have a facility producing fuel.

The reason algae are a potentially efficient fuel source is that huge amounts can be grown in a relatively small area. Algae grown on 2,400 acres could produce as much fuel as 115,000 acres of corn, Corderman said.

Another benefit of algae farming is that it consumes carbon dioxide, a greenhouse gas, produced in the ethanol-making process. Carbon dioxide also will be captured for other applications such as beverage carbonation, cooling and the production of dry ice.

The ethanol will be used primarily as an additive to gasoline to make it burn cleaner, not as a primary fuel known as E85 - a blend of 85 percent ethanol and 15 percent gasoline. The plant's service area - Arizona, Las Vegas and Southern California - demands so much ethanol that it will absorb all of the plant's production just as an additive, Corderman said.

"This region has a huge ethanol deficit," he said.

PLENTY OF POWER
Leonard Byrd, project manager for APS Energy Services, believes the project is economically and technically feasible. He said it uses existing technologies, although in a different combination than has been tried anywhere else.

"Right now all the preliminary numbers say we should be able to make all of the power and all of the steam that will be needed," he said. "And we're hoping to have surplus energy that could be put back in the market."

APS Energy Services has had preliminary discussions with other dairies and feedlots in Arizona to produce renewable energy from manure, he said. But some of them may wait to see how the XL Dairy project turns out first, he said.

"To some extent, people are wanting to see the actual product work."

LOCAL OPPOSITION
Opposition to the XL project surfaced last fall when the company applied for a special use permit from La Paz County. Neighbors in Vicksburg and Salome complained about potential traffic, smells, safety, environmental and other problems they believed the facility would generate. As a result of those concerns, La Paz County supervisors placed 23 stipulations on the project as conditions for receiving the permit.

Among the requirements are that the company coordinate with local fire districts and police to ensure the safety of the plant and surrounding area and draw up hazardous material and emergency response plans.
**Maximum efficiency**

XL Dairy Group is developing a new biorefinery that will integrate a dairy, a fractionation mill, an ethanol plant, a biodiesel plant and an on-site energy plant to produce renewable biofuels, quality animal feeds and milk products.

How all the parts of the dairy/biorefinery work together:

- **Dairy**
  - Manure: The dairy's waste manure produces methane that is captured and used as a fuel to produce electricity.
  - Corn Starch: Contains the fermentable sugars that are converted into ethanol.

- **Distillers Grain**
  - The process of converting the corn starch into ethanol will produce distillers grain as a byproduct, which will be used as feed for the dairy cows. Excess distillers grain will be sold to other dairies and poultry producers.

- **Ethanol plant**
  - Ethanol
  - Distillers Grain

- **Energy plant**
  - Electricity and steam
  - Corn Starch
  - Corn Bran
  - thin stillage

- **Biodiesel plant**
  - Corn Germ
  - Biodiesel

- **Fractionation mill**
  - Corn Germ

When complete, the dairy/biorefinery will produce:

- **100 million gallons of ethanol annually**
- **30 million gallons of biodiesel annually**
- **21 million gallons of milk annually**

**Source:** XL Dairy Group

Ed Taylor, Scott Kischel/PHOENIX
The county also required the company to comply with air-quality laws, implement a county-approved landscaping plan, pave access roads and parking facilities and submit periodic water-use reports.

La Paz County Supervisor Mary Scott, who represents the Vicksburg area, said she supports the project because of the economic impact it will have on the largely rural county.

The dairy/biorefinery is expected to create about 400 construction jobs and 175 permanent jobs once it is operating.

"We're a smaller county, so that's a big shot in the arm for our tax rolls," she said.

Steve Owens, director of the Arizona Department of Environmental Quality, said the biorefinery will require an air-quality permit and possibly a water-quality permit. Although the factory plans to recycle many of its materials, it still will produce some emissions, he said.

He declined to discuss details because final plans have not yet been submitted to the department. But on the basis of verbal discussions, Owens said it appears the operation will be "pretty clean."

CLOSED LOOP
Some of the technology to be used at Vicksburg is already operating at the E3 Bio Fuels plant in Nebraska. It employs an anaerobic digester to transform cow manure to biogas, which is used as a substitute for natural gas in converting corn to ethanol at an attached biorefinery. It also involves a closed loop system, using byproducts from the ethanol process as feed for the animals.

However, the Nebraska project is not independent of the local power grid.

"They could become self-sufficient, but electricity is so cheap in the Midwest that it doesn't pay to set up an internal generating plant," said Peter Kelley, a publicist for the fuel factory.

Still, the operation is more efficient than conventional ethanol production, he said. The biorefinery produces 46 BTUs of ethanol energy for every one BTU of outside energy put into the process, he said.

Eventually, the developers hope to use cellulosic material from the corn plants to increase ethanol production by about 20 percent, Kelley said.

The major obstacles to getting the plant operating have been weather related, including tornadoes and heavy snow during the past winter, he said.

"It is working," he said. "It's all proven technology. The novel thing was linking it in a closed loop."
BEIJING — Chinese authorities acknowledged for the first time that ingredients exported to make pet food contained a prohibited chemical, stepping up their probe of two Chinese companies' roles in one of the USA's largest animal-food recalls.

While pledging cooperation with U.S. authorities investigating the recall, the Chinese government in a statement Thursday also disputed that the chemical — melamine, which is used to make plastic — was responsible for harming pets.

"There is no clear evidence showing that melamine is the direct cause of the poisoning or death of the pets," the Ministry of Foreign Affairs in Beijing argued in a prepared statement. "China is willing to strengthen cooperation with the U.S. side ... to find out the real cause leading to the pet deaths in order to protect the health of the pets of the two countries."

In a sign of government urgency, Chinese police two days ago sealed the headquarters of Binzhou Futian Bio-Technology, which exported rice protein concentrate to the USA for use in pet food. Paper strips were pasted across the doors of the eight ground-floor rooms the company rents in Wudi County, a five-hour drive southeast of Beijing.

As inspectors from the U.S. Food and Drug Administration prepare to visit the firms where the ingredients were made, Chinese and American food experts here say China's vast and fragmented food-processing industry makes inspection difficult and increases the likelihood of future problems.

FDA tests identified melamine in imported wheat gluten and rice protein concentrate in pet foods. It also has said cyanuric acid, a chemical related to melamine used in cleaning pools, was found in wheat gluten. The agency has said melamine, a chemical high in nitrogen, might have been added to the grain products to make them appear higher in protein than they were.

Since March 16, cat and dog food sold under more than 100 brand names have been recalled. The FDA has said 14 pets died after eating recalled foods, but anecdotal reports from veterinarians and pet owners point to higher numbers.

President Hu Jintao this week urged officials to intensify work on food safety, a growing concern among consumers in China, where mass poisonings from tainted products are common. Hu called on officials to monitor the entire food-production process and focus on prevention and resolving problems at their source.
That won't be easy, said Luo Yunbo at the College of Food Science and Nutritional Engineering at China Agricultural University, who briefed China's leader Monday on the FDA's role in food safety. "China is such a large country, with such a large population, and agricultural production is by individual farmers on a very small scale," Luo said. "There are so many farmers and food producers that it is a great challenge to inspect all foodstuffs and teach people better agricultural standards."

About 6,000 hogs in eight U.S. states may have been fed pet food made from salvage products that had the tainted rice gluten. The pet food was sold for reformulation before melamine was found. Several hundred hogs may have entered the human food supply, FDA officials said. While there is no tolerance for melamine in food, the FDA's Daniel McChesney said, "we believe the risks to be very low to humans."

Two more recalls were announced Thursday.

Costco Wholesale Corp. announced a recall of its Kirkland Signature Super Premium Lamb and Rice canned dog pet food with sell by dates of Aug. 21 2008 to April 15 of 2009. The food was made by American Nutrition using rice protein concentrate from Wilbur-Ellis, which imported the product from Binzhou Futian in China. Costco will mail 230,000 letters to all members who purchased the canned food on Friday, said Craig Wilson, food safety chief for Costco.

Chenango Valley Pet Foods also has begun voluntarily recalling pet foods manufactured with a certain shipment of rice protein concentrate it received from Wilbur-Ellis, the company said Thursday.

The pet foods were sold to customers in Wisconsin, Massachusetts and Pennsylvania, who in turn sold the products to their customers through catalog mail orders or retail outlets

**Find this article at:**
It takes a group of dedicated individuals to pull together all the pieces and put on a program such as this. The Summer Agricultural Institute would like to thank the 2007 SAI Planning Committee for all their efforts to organize and coordinate the entire week of activities.

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HAVE A GREAT SUMMER!