22nd Annual
Summer Agricultural Institute
June 4 - 8, 2012
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:

**Sponsors**

A Tumbling T Ranches, Ron Rayner
Agri-Business Council of Arizona, Chris Udall
Arizona Ag Marketing & Consulting Group, Mark Howard
Arizona Cattle Industry Foundation, Bill McGibbons
Arizona Cotton Growers Association, Rick Lavis
Arizona Farm Bureau, Jim Klinker
Arizona Grain, Inc., Eric Wilkey
Arizona Grain Research & Promotion Council, Allan Simons
Arizona Milk Producers, Tammy Baker
Auza Ranches, Carmen Auza
Bill Kerr Dairy, Bill and Sine Kerr
Briggs & Eggers Orchards, Lance and Melissa Eggers
Buckeye Valley NRCD, Rayanne Leister
Chris and Monica Pastor
Condor Seed Production, Inc., Thomas Tolman
Desert Tree Farm, John Augustine
Discovery West Farming Co., Tim Smith
Ecologic Solutions, Linda Dee Diamontides
Gila Bend NRCD, Roy and Ella Pierpoint
Hidden Springs Ranch, Brett Hone
Lakin Milling Company, Chuck Lakin
Maricopa County Farm Bureau, Bill Kerr
MK Farms, Michael Brooks
Moore & Moore Cattle Ranch, Roy and Kathy Moore
Mountain States Wholesale Nursery, Bart Worthington
OX Ranch, John and Joan Murphy
R & S Farms, Rick and Sherry Saylor
SAI 2010 Participant, Chris Krause
SAI 2011 Participant, Linda Howard
SAI 2011 Participant, Larry and Patricia Hellman
Sun Circle Trail Riders, Marge Martin
Sun Circle Trail Riders, Ron Cordova
Tempe Farming Co., Dan Thelander
Treasures 4 Teachers, Louise Bunker
Wellton-Mohawk Valley NRCD, David Sharp

**In Kind Sponsors**

Arizona Beef Council
Arizona Cotton Growers Association
Arizona Crop Improvement Association
Arizona Department of Agriculture
Arizona Milk Producers
Arizona State Cowbelles
Arizona Stronghold Vineyard
Bingham Farm Equipment
Bonita Beans
Briggs and Eggers Orchard
Caballero Dairy Farms
Cienega Ranch
Civano Nursery
Curry Seed and Chile Co.
Dairy Council of Arizona
Farm Family Hosts
Gila River Community Project
Maricopa County Cattlewomen
Maricopa County Farm Bureau
Pinal Energy, LLC
Pinal Feeding Co.
Pistachio Corp of Arizona / A&P Growers
Salt River Project
U of A William J. Parker Agriculture Research Center
U of A Cooperative Extension, Maricopa Co
U of A Maricopa Agricultural Center
U of A Meat Science Laboratory
USDA Arid Lands Research Center
Willcox Cowbelles
Willcox Livestock Auction
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 15,600 farms in our state.

Source: 2010 Arizona Agricultural Statistics Bulletin
www.nass.usda.gov/az/
# Week at a Glance

The Summer Agricultural Institute is a highly interactive five-day tour designed to teach you about food and fiber production and to help you incorporate that knowledge in the classroom. You will visit a variety of agricultural operations, spend an entire day at the University of Arizona's research farm, and spend time with a family on a modern-day working farm or ranch. SAI is an action packed adventure that combines hands-on learning about agriculture with practical curriculum development.

Throughout this week you will tour the following sites and hear from a variety of additional agriculture related organizations and people. This book is designed to help you make the most of your trip. Let us know how we can support your learning adventure this week.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA Cooperative Extension, Maricopa County</td>
<td>Civano Nursery</td>
<td>Briggs and Eggers Orchard</td>
<td>U of A Meat Science Laboratory</td>
<td>UA Cooperative Extension, Maricopa County</td>
</tr>
<tr>
<td>UA Maricopa Agriculture Center</td>
<td>Curry Seed and Chile Co.</td>
<td>Pistachio Corp. of AZ / A &amp; P Growers</td>
<td>U of A Agriculture Research Center</td>
<td>Arizona Department of Agriculture</td>
</tr>
<tr>
<td>Pinal Feeding Co.</td>
<td>Bonita Bean Company</td>
<td>Willcox Livestock Auction</td>
<td>Caballero Dairy</td>
<td>Arizona Cotton Growers Association</td>
</tr>
<tr>
<td>Pinal Energy, LLC.</td>
<td>Arizona Stronghold Vineyard</td>
<td>Farm Family visits</td>
<td>Bingham Farm Equipment</td>
<td>Ag Organization Exhibits</td>
</tr>
<tr>
<td>USDA Arid Lands Research Center</td>
<td>Cienega Ranch</td>
<td></td>
<td>Sponsors Appreciation Banquet - SRP Pera Club</td>
<td></td>
</tr>
</tbody>
</table>
Week at a Glance
Monday, June 4, 2012

7:00 am  
Registration/continental breakfast  
*Hosted by Dairy Council® of Arizona*  
UA Cooperative Extension, Maricopa County  
4341 E. Broadway, Phoenix, AZ  85040  
http://extension.arizona.edu/maricopa  

7:30 
Welcome / Introductions / Ag Quiz  

8:15 
Depart  

9:00  
**U of A Maricopa Agriculture Center**  
Mailing address: 37860 Smith-Enke Rd., Maricopa, AZ 85238  
www.cals.arizona.edu/aes/mac  
Welcome – *Victor Jimenez*  
Insect Management & Collection – *Virginia Barkley*  

9:45 
Depart  

10:00  
**Pinal Feeding Co.** – Cattle feedlot  
Mailing address: 38585 W Cowtown Rd, Maricopa, AZ 85139  
Norm Hinz and Dr. Jerry Biwer, DVM  
www.pinalfeeding.com  
**Pinal Energy, LLC** - Ethanol plant  
Lee Steffen  
Mailing address: PO Box 143, Maricopa, AZ 85139  
www.pinalenergyllc.com  

11:00 
Depart  

11:15  
**U of A Maricopa Agriculture Center**  
Siphon Tube Experience – *Victor Jimenez*  

12:00 pm  
**Lunch - Hosted by Arizona Foundation for Agricultural Literacy (AFAL)**  
Addressing Misconceptions about Agriculture  
*Jeannette Fish, Maricopa County Farm Bureau*  
Gila River Community Project – *Sonny Nieto*  

1:30  
Insect Science (Group A) – *Virginia Barkley*  
Plant Science (Group B) – *Al Fournier*  
*Switch classes - Insect Science and Plant Science*  
MAC Ag-Ventures & Ag Jeopardy – *Victor Jimenez*  

3:30  
**USDA Arid Lands Research Center** – *Steve Naranjo*  
Mailing address: 21881 N. Cardon Ln., Maricopa, AZ 85138  

4:00  
Depart – processing time on the bus  

5:45  
**Dinner** – Cracker Barrel, Tucson  

6:45  
**Check into hotel** – La Quinta Inn  
6020 W. Hospitality Rd, Tucson
Monday, June 4, 2012
Journaling pages...

As you begin this week’s adventure, use these pages throughout the booklet to record your thoughts, comments, ideas, suggestions, etc. Think about how you may be able to use the information you are learning in your classroom and what additional resources you might need to help you impart this knowledge to your students. Throughout the week, there will be times planned for you to process your experiences and thoughts with each other in small groups and with the group as a whole. Refer back to these pages for those processing sessions - to remind yourself of your notes and to jot down ideas from your fellow teachers.

**MONDAY** - UA Cooperative Extension - Introduction, Ag quiz

---

Maricopa Ag Center: insect collection, siphon tubes, insect science, plant science, MAC Ag-ventures

---

Pinal Feeding Co.

---

Pinal Energy, LLC

---

USDA Arid Lands Research Center
** * * * Journaling - Monday * * * **

Today I learned...


Today, my opinion about was changed/supported by:


I would like clarification on...


I can use this in my classroom by...


High point of the day...
Tuesday, June 5, 2012

6:15 am  A  Breakfast at hotel and checkout

6:45  Depart

7:30  B  Civano Nursery  
*Chris and Nick Shipley*
5301 S. Houghton Road, Tucson, AZ 85747
www.civanonursery.net

8:30  Depart  
Activities Development on the bus  
*Monica Pastor, UA Cooperative Extension*

10:00  C  Curry Seed and Chile Co.  
*Ed Curry*
1091 E. Curry Farms Rd., Pearce 85625
www.curryseedandchile.com

11:00  Depart - Lunch on the bus

12:00 pm  D  Bonita Bean Company  
*Brent Haas and Bill Ellis*
7750 S. Kansas Settlement Rd., Willcox 85643
www.bonitabean.com

1:00  Depart

1:30  E  Arizona Stronghold Vineyard  
*Craig Martinsen*
6707 S. Wayward Winds Rd., Willcox 85643
www.azstronghold.com

2:30  Depart

3:30  F  Cienega Ranch  
*Helen and Chance Fraze*
9122 S. Hwy 186, Willcox, AZ 85643

5:00  Depart

5:30  Dinner: Big Tex BBQ

6:30  Depart

6:35  G  Quality Inn Willcox  
1100 W. Rex. Allen Dr., Willcox 85643
Tuesday, June 5, 2012

Willcox

TUCSON

Tuesday Overview
**Journaling - Tuesday**

Civano Nursery

Curry Seed and Chile Co.

Bonita Beans

Arizona Stronghold Vineyard

Cienega Ranch

High point of the day...

General thoughts...
* * * Journaling - Tuesday * * *

Activities Development Session:

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

Best ideas for classroom integration:

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
Wednesday, June 6, 2012

6:30 am  A  Breakfast at hotel and check out

7:00  Depart

7:30  B  Briggs & Eggers Orchard  (pg37)
Jean Briggs
27197 S. Brookerson Rd., Willcox 85643
www.briggs-eggers.com

8:30  Depart - process time on the bus, discuss Tuesday’s site visits

9:30  C  Pistachio Corporation of Arizona / A & P Growers  (pg 46)
Jim Cook
P.O Box 416, Willcox, AZ 85605

10:30  Depart

11:15  Willcox Livestock Auction  (pg 53)
Sonny Shores and Kayla Shores
PO Box 1117, Willcox, AZ 85643
www.willcoxlivestockauction.com

12:15 pm  D  Lunch
Hosted by the Willcox Cowbelles

1:00  Host Family Pickup
You will have an opportunity to spend time with a family actively working in agriculture in some way.

Dinner with Host Families

6:30  A  Host drop-off at Quality Inn
1100 W. Rex. Allen Dr., Willcox 85643

7:00  Depart - Process time on the bus.

8:30  E  Check into hotel – La Quinta Inn
6404 E. Broadway Blvd., Tucson
Wednesday, June 6, 2012
** * Journaling - Wednesday * * **

Briggs & Eggers Orchard

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Pistachio Corporation of Arizona / A & P Growers

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Willcox Livestock Auction

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Willcox Cowbelles

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

High point of the day...

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

General thoughts...

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
The 2012 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.

My host family was:  

About the family:  

What they do:  

Reflections on the experience:  

This year’s host families:  

David & Cathy Collins  
Moser Collins Farm  

Sonia Gasho  
Stronghold Beef  

Jim & Ruth Graham  
Cochise Groves  

John & Amanda Hart  
Wagonwheel Farm  

Anne Holcomb  
Apple Annie’s Orchard  

Craig Martinsen  
Arizona Stronghold Vineyards  

Lance & Alicia Owens  
LAD Farms  

Claire Owen  
Owen Agricultural Services
Thursday, June 7, 2012

7:00 am **Breakfast** at hotel and checkout

7:30  

Depart

8:00  
**U of A Meat Science Laboratory**  
*Dr. John Marchello, DVM*  
4181 N. Campbell Ave., Tucson 85719  
www.ag.arizona.edu/ANS/meat_sci_lab.html

9:00  
**U of A William J. Parker Agricultural Research Center**  
*Dr. Sean Limesand*  
Mailing address: UA Dept of Animal Science,  
1650 E. Limberlost Ave, Tucson, AZ 85719  
http://animal.cals.arizona.edu/ag_res_center.html

10:00  
Depart

11:15  
**Caballero Dairy Farm**  
*Craig Caballero*  
2943 W. Harmon Rd., Eloy 85131

12:45 pm  
Depart, *Lunch* on the bus

1:30  
**Bingham Farm Equipment**  
*Dave DeBold*  
815 W. Gila Bend Hwy., Casa Grande 85122  
www.binghamfarmmachinery.com

2:30  
Depart - processing time on the bus

3:45  
**Check into La Quinta Inn** to prepare for banquet  
911 S. 48th St. Tempe, 85281

5:15  
Depart

6:00  
**Twenty-second Annual Summer Agricultural Institute**  
**Sponsor’s Appreciation Banquet**  
Salt River Project PERA Club  
*Marc Campbell*  
1 E. Continental Dr., Tempe 85281  
www.srpnet.com/education

7:45  
Depart

8:00  
**Return to hotel – La Quinta Inn**  
911 S. 48th St. Tempe, 85281
**Journaling - Thursday**

U of A Meat Science Laboratory

U of A Agricultural Research Center

Caballero Dairy

Bingham Farm Equipment

Sponsor’s Appreciation Banquet
** Journaling - Thursday **

Today I learned...

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Today, my opinion about was changed/supported by:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

I would like clarification on...

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

I can use this in my classroom by...

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Friday, June 17  (Monica Pastor)

6:30 am  Breakfast at hotel and checkout

7:30  Depart

8:30  Arizona Cotton Growers Association  (pg 29)
Dan Thelander

8:45  Curriculum Incorporation Session  (pg 49)
Monica Pastor, U of A Ag Literacy Program
UA Cooperative Extension, Maricopa County
4341 E. Broadway, Phoenix, AZ 85040
www.cals.arizona.edu/agliteracy

11:45  Arizona Department of Agriculture presentation  (pg 30)
John Caravetta, Associate Director, Plant Services Division
www.azda.gov

12:00 pm  Lunch and Organizational Displays  (pg 42)
Hosted by Arizona Milk Producers

1:30  Final Discussions / Evaluation / Wrap up

2:30  Adjourn
## Friday Exhibitors

<table>
<thead>
<tr>
<th>Organization</th>
<th>Contact Person</th>
<th>Contact Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona Beef Council</td>
<td>Tiffany Hayes</td>
<td><a href="http://www.arizonabeef.org">www.arizonabeef.org</a></td>
</tr>
<tr>
<td></td>
<td>Lauren Scheller</td>
<td>602-273-7163</td>
</tr>
<tr>
<td>Arizona Farm Bureau Federation</td>
<td>Peggy Jo Goodfellow</td>
<td><a href="http://www.azfb.org">www.azfb.org</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:peggyjogoodfellow@azfb.org">peggyjogoodfellow@azfb.org</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>480-635-3609</td>
</tr>
<tr>
<td>Arizona Statewide Gleaning Program</td>
<td>Brian Simpson</td>
<td><a href="mailto:brian@azfoodbanks.org">brian@azfoodbanks.org</a></td>
</tr>
<tr>
<td>Arizona State Parks</td>
<td>Mary Alice Daenzer</td>
<td><a href="mailto:mdaenzer@azstateparks.gov">mdaenzer@azstateparks.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>480-458-8328</td>
</tr>
<tr>
<td>Central Arizona Project</td>
<td>Bob Navigato</td>
<td><a href="mailto:bnavigate@cap-az.com">bnavigate@cap-az.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>623-869-2134</td>
</tr>
<tr>
<td>Dairy Council of Arizona</td>
<td>Colleen Bergum</td>
<td><a href="http://www.dairycouncilofaz.org">www.dairycouncilofaz.org</a></td>
</tr>
<tr>
<td></td>
<td>Terri Verason</td>
<td><a href="mailto:tverason@dcaz.org">tverason@dcaz.org</a></td>
</tr>
<tr>
<td>Maricopa County Farm Bureau</td>
<td>Jeannette Fish</td>
<td><a href="mailto:mcfb@qwestoffice.net">mcfb@qwestoffice.net</a></td>
</tr>
<tr>
<td></td>
<td>Sherri Jepsen</td>
<td>602-437-1330</td>
</tr>
<tr>
<td>The Phoenix Zoo Education Programs</td>
<td>Gabby Herbert</td>
<td><a href="http://www.phoenixzoo.org">www.phoenixzoo.org</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:gherbert@thephxzoo.com">gherbert@thephxzoo.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>602-286-3822</td>
</tr>
<tr>
<td>USDA/NASS</td>
<td>Dave DeWalt</td>
<td><a href="mailto:dave.dewalt@nass.usda.gov">dave.dewalt@nass.usda.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>602-280-8850</td>
</tr>
</tbody>
</table>
** * * * Journaling * * * **

Overall impressions of the week:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

How this experience will improve my teaching:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Resources

and

News Articles
Table of Contents

Facility Visits
Arizona Cotton Growers Association .......................................................... 29
Arizona Stronghold Vineyard ............................................................... 34
Bingham Farm Equipment ........................................................................ 35
Bonita Bean Company ............................................................................. 36
Briggs and Eggers Orchard ....................................................................... 37
Caballero Dairy Farms .............................................................................. 38
Cienega Ranch .......................................................................................... 39
Civano Nursery ........................................................................................ 40
Curry Seed and Chile Co. ......................................................................... 41
Pinal Energy, LLC ..................................................................................... 44
Pinal Feeding Co. ...................................................................................... 45
Pistachio Corporation of Arizona, A & P Growers ...................................... 46
Salt River Project ....................................................................................... 47
U of A Agriculture Research Center ......................................................... 48
U of A Cooperative Extension, Maricopa County .................................... 49
U of A Maricopa Agriculture Center ........................................................ 50
U of A Meat Science Laboratory .............................................................. 51
USDA Arid Lands Research Center .......................................................... 52
Willcox Livestock Auction ....................................................................... 53

Additional Sponsors
Arizona Beef Council .................................................................................. 28
Arizona Department of Agriculture ............................................................. 30
Arizona Dept. of Educ. Career & Technical Services & FFA ..................... 31
Arizona Farm Bureau .................................................................................. 32
Arizona State Cowbelles, Inc. ................................................................. 33
Dairy Council of Arizona/Arizona Milk Producers .................................... 42
Maricopa County Farm Bureau ................................................................. 43

Articles of Interest
2010 Arizona Agriculture Overview ........................................................ 27
SAI Suggested Reading List .................................................................... 54
Additional Articles .................................................................................... 58
2010 STATE AGRICULTURE OVERVIEW

ARIZONA

Farms (2010)

<table>
<thead>
<tr>
<th>Description</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Farms</td>
<td>15,500</td>
</tr>
<tr>
<td>Land in Farms (acres)</td>
<td>26,100,000</td>
</tr>
<tr>
<td>Average Farm Size (acres)</td>
<td>1,684</td>
</tr>
</tbody>
</table>

Livestock Inventory

<table>
<thead>
<tr>
<th>Description</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle and Calves – All (Jan 1, 2011)</td>
<td>870,000</td>
</tr>
<tr>
<td>Hogs and Pigs – All (Dec 1, 2010)</td>
<td>165,000</td>
</tr>
<tr>
<td>Sheep (Jan 1, 2011)</td>
<td>150,000</td>
</tr>
</tbody>
</table>

Milk

<table>
<thead>
<tr>
<th>Description</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk Cows (Average head)</td>
<td>177,000</td>
</tr>
<tr>
<td>Milk Production per Cow (lbs)</td>
<td>23,441</td>
</tr>
</tbody>
</table>

Value of Crop Production

Includes:
- Food Grains: $118,808,000
- Feed crops: $301,926,000
- Cotton: $188,8069,000
- Fruit & Tree Nuts: $72,917,000
- Vegetables: $782,048,000

Value of Livestock Production: $1,527,272,000

Total Value of Agricultural Sector Production: $4,063,701,000

Changes Over Time  2007 - 2009

<table>
<thead>
<tr>
<th>Description</th>
<th>2007</th>
<th>2009</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Farms</td>
<td>15,600</td>
<td>15,500</td>
<td>- &lt;1%</td>
</tr>
<tr>
<td>Land in Farms</td>
<td>26,100,000</td>
<td>26,100,000</td>
<td>NC</td>
</tr>
<tr>
<td>Average Size of Farm</td>
<td>1673 acres</td>
<td>1684 acres</td>
<td>+1%</td>
</tr>
<tr>
<td>Cash Receipts</td>
<td>$3,589,202,000</td>
<td>$2,943,646,000</td>
<td>- 18%</td>
</tr>
<tr>
<td>Crops</td>
<td>$1,998,911,000</td>
<td>$1,765,703,000</td>
<td>- 12%</td>
</tr>
<tr>
<td>Livestock</td>
<td>$1,590,291,000</td>
<td>$1,177,761,000</td>
<td>- 26%</td>
</tr>
<tr>
<td>Average Per Farm</td>
<td>$230,077</td>
<td>$189,901</td>
<td>- 17%</td>
</tr>
</tbody>
</table>

Vegetable & Melon Harvested Acres  2009-2010

- Broccoli: 7,200
- Cabbage: 2,100
- Cauliflower: 3,000
- Chile Peppers: 2,900
- Lettuce: 8,500
- Leaf Lettuce: 18,500
- Okra: 3,700
- Potatoes: 3,700
- Radishes: 18,500
- Romaine: 18,500
- Spinach: 7,500
- Tomatoes: 34,000
- Watermelon: 5,300
- Cantaloupe: 20,800
- Honeydew: 8,300
WHO ARE WE?
Congress created the Beef Promotion and Research Act, the “Beef Checkoff Program,” with passage of the 1985 Farm Bill. Producers approved making the Beef Checkoff Program mandatory in 1988, with 79 percent voting in favor of it.

PRODUCERS ASKED THE CHECKOFF PROGRAM BE BUILT ON THESE TENETS:
• All producers and importers pay the same $1-per head.
• One-half of the money collected by state beef councils – 50 cents of every dollar- is invested through the beef council in each state.
• All national checkoff-funded programs are budgeted and evaluated by Cattlemen’s Beef Board, and independent organization of 104 checkoff-paying volunteers.
• Beef Board members are nominated by fellow state producers and appointed by the U.S. Secretary of Agriculture.

THE BEEF CHECKOFF ACTS AS A CATALYST FOR CHANGE...
The checkoff doesn’t own cattle, packing plants or retail outlets. It can’t control prices or single-handedly turn around a bad market. The Beef Checkoff Program was designed to stimulate consumers to buy more beef. This is accomplished through a combination of initiatives including consumer advertising, research, public relations, education and new product development.

RESOURCES FOR TEACHERS
The Arizona Beef Council provides materials for classroom, presentations and ranch tours with topics including nutrition, the basics of the beef industry, food safety, beef byproducts, and the Arizona Cattle Industry all for FREE! Visit www.arizonabeef.org for more information.

OTHER USEFUL CHECKOFF FUNDED WEBSITES...
• www.beefitswhatsfordinner.com - Helpful cooking tips and recipes
• www.explorebeef.org - Explains the story, environmental and economics of beef
• www.beefnutrition.org -All the nutrition information you need
• www.nationalbeefambassador.org - Opportunity for students to become ambassadors for beef
• www.zip4tweens.com - Helps kids and their families find a balanced approach to a healthier lifestyle.
• www.teachfree.com – Free, high-quality, downloadable educational materials for preschool -12th

For more educational questions or requests, please contact
Tiffany Hayes at 602.273.7163 or tnhayes@arizonabeef.org
Arizona Cotton Growers Association

The Arizona Cotton Growers Association was created in 1944 to help in the recruitment of labor. Such efforts led to the development of the “Bracero” through which the Federal Government assisted with the importation of Mexican laborers to pick Arizona cotton until the advent of mechanical pickers.

Over the years, the Association has been engaged in a wide range of issues from farm programs to pest eradication (boll weevil, white fly, pink bollworm) to air quality.

The Arizona Cotton Growers Association is governed by a 50 member Board of Directors composed of cotton producers from across the State. The mission of the Arizona Cotton Growers Association “is to protect and improve the economic viability of the Arizona cotton producer.”

**Bounty from a Bale**

People often wonder how many typical items can be made from a bale of cotton. We present these examples of selected products which come from a 480 pound net weight bale. Figures are approximations.

Source: National Cotton Council

| Men's woven handkerchiefs | 8,000 |
| Men's knitted stockings | 3,400 |
| Men's pajamas | 400 |
| Men's dress and business shirts | 800 |
| Men's sport shirts | 725 |
| Men's sweat shirts | 500 |
| Men's knit sweaters | 500 |
| Men's and boy's dress & sport trousers | 450 |
| Men's and boy's jeans | 325 |
| Men's and boy's work trousers | 375 |
| Men's and boy's shorts & briefs | 2,600 |
| Ladies blouses and shirts | 850 |
| Ladies knit and woven dresses | 350 |
| Ladies brassieres | 7,000 |
| Ladies Handkerchiefs | 22,000 |
| Diapers | 3,000 |
| Sheets, flat, full size | 200 |
| Pillowcases | 1,200 |

**Current Cotton Production**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Planted Acres</th>
<th>Yield (Lbs/Acre)</th>
<th>Production (# of bales)</th>
<th>Price per Lb</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>280,000</td>
<td>1,366</td>
<td>791,000</td>
<td>$0.39</td>
<td>$150 Million</td>
</tr>
<tr>
<td>2001</td>
<td>295,000</td>
<td>1,142</td>
<td>690,000</td>
<td>$0.28</td>
<td>$94 Million</td>
</tr>
<tr>
<td>2002</td>
<td>215,000</td>
<td>1,381</td>
<td>613,000</td>
<td>$0.48</td>
<td>$131 Million</td>
</tr>
<tr>
<td>2003</td>
<td>213,000</td>
<td>1,239</td>
<td>550,000</td>
<td>$0.69</td>
<td>$186 Million</td>
</tr>
<tr>
<td>2004</td>
<td>238,000</td>
<td>1,458</td>
<td>723,000</td>
<td>$0.50</td>
<td>$163 Million</td>
</tr>
<tr>
<td>2005</td>
<td>230,000</td>
<td>1,289</td>
<td>615,000</td>
<td>$0.516</td>
<td>$152 Million</td>
</tr>
<tr>
<td>2006</td>
<td>190,000</td>
<td>1,420</td>
<td>556,000</td>
<td>$0.499</td>
<td>$133 Million</td>
</tr>
<tr>
<td>2007</td>
<td>170,000</td>
<td>1,469</td>
<td>500,000</td>
<td>$0.60</td>
<td>$144 Million</td>
</tr>
<tr>
<td>2008</td>
<td>133,000</td>
<td>1,462</td>
<td>405,000</td>
<td>$0.58</td>
<td>$113 Million</td>
</tr>
<tr>
<td>2009</td>
<td>145,000</td>
<td>1,450</td>
<td>440,000</td>
<td>$0.65</td>
<td>$138 Million</td>
</tr>
<tr>
<td>2010</td>
<td>195,000</td>
<td>1,517</td>
<td>610,000</td>
<td>$0.87</td>
<td>$246 Million</td>
</tr>
</tbody>
</table>

**Pima Cotton**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Planted Acres</th>
<th>Yield (Lbs/Acre)</th>
<th>Production (# of bales)</th>
<th>Price per Lb</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>7,800</td>
<td>928</td>
<td>14,500</td>
<td>$0.84</td>
<td>$5 Million</td>
</tr>
<tr>
<td>2002</td>
<td>8,300</td>
<td>1013</td>
<td>17,300</td>
<td>$0.82</td>
<td>$6 Million</td>
</tr>
<tr>
<td>2003</td>
<td>2,400</td>
<td>920</td>
<td>4,600</td>
<td>$1.05</td>
<td>$3 Million</td>
</tr>
<tr>
<td>2004</td>
<td>3,000</td>
<td>896</td>
<td>5,600</td>
<td>$0.99</td>
<td>$2.9 Million</td>
</tr>
<tr>
<td>2005</td>
<td>4,100</td>
<td>820</td>
<td>7,000</td>
<td>$1.18</td>
<td>$4 Million</td>
</tr>
<tr>
<td>2006</td>
<td>7,000</td>
<td>919</td>
<td>13,400</td>
<td>$0.90</td>
<td>$5.8 Million</td>
</tr>
<tr>
<td>2007</td>
<td>2,500</td>
<td>960</td>
<td>5,000</td>
<td>$0.95</td>
<td>$2.3 Million</td>
</tr>
<tr>
<td>2008</td>
<td>800</td>
<td>480</td>
<td>800</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2009</td>
<td>2,000</td>
<td>997</td>
<td>4,000</td>
<td>$1.13</td>
<td>$2 Million</td>
</tr>
<tr>
<td>2010</td>
<td>3,000</td>
<td>845</td>
<td>4,000</td>
<td>$1.70</td>
<td>$4 Million</td>
</tr>
</tbody>
</table>
Arizona Department of Agriculture

The Arizona Department of Agriculture is a cabinet-level statewide agency with 263 employees and an annual budget of more than $22 million. Our goal is to regulate and support Arizona agriculture in a manner that encourages farming, ranching, and agribusiness while protecting consumers and natural resources. The agency consists of three main divisions: Animal Services, Environmental Services, Plant Services.

The Department also includes a State Agricultural Laboratory; a Citrus, Fruit and Vegetable Standardization and Fresh Produce Grade Inspection program; and an Agricultural Consultation and Training program.

Plant Services Division - Protecting Arizona’s native plants.
Ensure the public and the agriculture industry that dangerous plant infestations prevented or readily controlled. (Such pests include: gypsy moth, Mediterranean fruit fly, and imported fire ant, among others.)

Animal Services Division
We protect consumers from contagious and infectious disease in livestock, poultry, commercially raised fish, meat, milk, and eggs. We do this by enforcing laws concerning the movement, sale, importation, transport, slaughter, and theft of livestock. In addition, we conducting food quality and safety inspections of milk and meat products produced and processed in Arizona, and of egg and egg products produced in, or imported to, Arizona.

Environmental Services Division
Register and licensing feed, fertilizer, seed and pesticide companies or products in accordance with federal and state laws; Sampling for product quality to help protect the consumer; Enforce pesticide use compliance to ensure established buffer zones are adhered to, environmental concerns are met, and people are protected; Train and certify pesticide applicators and advisors. This includes the Worker Safety program, which is responsible for preventing or limiting farm workers exposure to pesticides.

Citrus, Fruit and Vegetable Standardization
The Citrus, Fruit, and Vegetable Standardization program monitors and enforces the quality standards for all fresh fruit and vegetables produced and marketed in Arizona. Citrus, Fruit, and Vegetable Standardization continues to support the state-wide gleaning program -- a collection of wholesome food for distribution to the poor and hungry. This program gathered and distributed over 40.3 million pounds of produce in FY 2009.

Agricultural Consultation and Training
The Agricultural Consultation and Training (ACT) Program is an innovative compliance assistance program unique to an agricultural regulatory agency. This program embraces the ADA’s goal of encouraging farming, ranching and agribusiness, while protecting consumers and natural resources by utilizing a non-enforcement approach. ACT is not affiliated with any of ADA’s enforcement programs, allowing staff members to provide a formal means by which the regulated agricultural community may request compliance assistance without regulatory intervention. ACT serves Arizona’s diverse agricultural community through the following compliance assistance and education programs: Pesticide Safety, Air Quality, and Agricultural Conservation Education.

ACT also houses the Livestock & Crop Conservation Grant Program, Specialty Crop Block Grant Program, AZ Citrus Research Council, AZ Iceberg Lettuce Research Council, AZ Grain Research and Promotion Council, Agricultural Employment Relations Board, and the AZ Agricultural Protection Commission.

State Agricultural Laboratory
We provide quality agricultural and environmental laboratory analysis, identification, certification and training services to various regulatory divisions of the Department and others as provided by law. To accomplish this mission, we are divided into Biology and Chemistry.
The National FFA Organization was organized as the "Future Farmers of America" in 1928 in Kansas City, Missouri. In 1988, the official name of the organization was changed to The National FFA Organization to reflect the broadening field of agriculture, which today encompasses more than 300 careers in everything from agri-science to biotechnology to turf grass management.

FFA operates on local, state and national levels. Student members belong to chapters organized at the local school level. Agricultural education instructors serve as chapter advisors. Chapters are organized under state associations headed by an advisor and executive secretary, often employees of the state department of education. States conduct programs and host annual conventions.

Through active participation in the FFA, members learn by taking part in and conducting meetings, speaking in public, participating in contest based on occupational skills, earning awards and recognition and becoming involved in cooperative efforts and community improvement. The FFA offers opportunities for becoming productive citizens in our democracy.

FFA members believe in leadership, citizenship, and patriotism. They believe in free enterprise—freedom under the law-in making their homes, schools, and communities’ better places in which to live and work.

Members participate in regular chapter meetings, present motions, debate issues, and take part in decision making. They work hard, but they also play hard, as recreation is also a part of each year's program of activities.
Arizona Farm Bureau

Arizona Farm Bureau is a grassroots organization dedicated to preserving and improving the Agriculture industry through member involvement in education, political activities, programs and services. The Arizona Farm Bureau is Arizona’s largest farm and ranch organization with membership that represents production agriculture throughout the state of Arizona.

Farm Bureau’s purpose is to be an independent, non-governmental grassroots organization that analyzes problems and formulates action to achieve educational improvement, economic opportunity, and social advancement in order to promote the financial and overall well being of agriculture and our members. We are the "Voice of Agriculture in Arizona."

As the agriculture industry faces new challenges in the future, Farm Bureau will be there to assist our members in meeting those challenges. We will be involved in lobbying on county, state and national issues. We will be there to discuss issues of profitability, property rights, labor, water, trade, farm policy, tax issues, environmental issues and much more. We will also continue to offer value to our members by providing products and services.

We reach out to the public in many ways to teach them that their food, fiber and ornamentals come from farms and ranches, not from the store. Activities to promote agriculture to the public and the schools are also a focal point of the Farm Bureau.

**Ag in the Classroom**
The Arizona Farm Bureau Ag in the Classroom program strives to develop and implement curriculum and programs that are aligned to the state and core learning standards to help students and teachers be successful, while increasing agricultural awareness in K-6 classrooms and beyond.

**Free Resources for Teachers** - You take the kits or we come to your classroom
- Curriculum Kits
- Farmer/Rancher Pen Pals
- Classroom presentations
- School Field Trips
- Ag Lending Library
- Informational websites

**Online Product Directory**
Arizona Farm Bureau’s Fill Your Plate is an on-line direct market product directory. From apples to zucchini, and everything in between, Arizona’s farmers and ranchers will fill you up with the best knowledge of where your Arizona food comes from. Find locally grown products at www.fillyourplate.org.

Farm Bureau is local, county, state, national, and international in its scope and influence, and is non-partisan, non-sectarian, and non-secret in character. We are supported by dues-paying members, and we offer a myriad of services, discounts and benefits to our members.

Arizona has 13 active county Farm Bureaus covering all 15 counties. These are the basis of our grassroots organization. Each county Farm Bureau is an independent entity governed by local farmer and rancher volunteer leaders. All ideas, solutions, and leadership come from the members of the county Farm Bureau.
Arizona State Cowbelles, Inc.

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.

Visit www.ArizonaCowbelles.org to find out more about the Cowbelles’ Scholarship Program or to contact the Cowbelles’ Officers and Local Presidents.
Arizona Stronghold Vineyard
Arizona Wines from Cochise County

Arizona Stronghold Vineyards (ASV) farms the eastern and northern edges of the Sulfur Springs Valley, on 200 acres in southeastern Arizona and we sustainably farm grapes on 120 of them. Our Stronghold vineyard, located in Kansas Settlement, 15 miles south of Willcox, AZ, lies in Cochise County and our Bonita Springs Vineyard can be found 20 miles north of Willcox in Graham County. We source the overwhelming majority of our grapes from our own estate, but sometimes dabble with other growers fruit to explore other expressions of our great state. These additions never comprise more than 15% of our total production.

The oldest 20 acres of the vineyard were planted in 1983 by a gentleman named Robert Webb for his R.W. Webb Winery. The middle aged 20 acres were planted in 1995 by Al Buhl, founder of Dos Cabezas Winery. In 2001, Al Buhl and Film Director Sam Pillsbury partnered on an additional 20 acres which they donned “Norte”. In 2003 Buhl and Pillsbury also planted a small outlying block to the west of Norte which was named the “nursery” block, as it was planted alongside the nursery where vine cuttings for replanting dead vines are rooted.

Arizona Stronghold Vineyards was formed in 2007 to put Arizona on the fine wine map. Great wine doesn’t have to be expensive; it doesn’t have to be pretentious; and it shouldn’t be hard to find. It just has to be great and it has to be made by people that care. ASV is all about place, people, quality and value. Enjoy a taste of Arizona from the bottle and open your mind to the potential of our stunning landscape.

Arizona Stronghold Vineyard, 6707 S. Wayward Winds Rd., Willcox 85643
www.azstronghold.com
Bingham Equipment Company

Bingham Equipment Company was established by Norm and Audrey Bingham in 1955 as a Ford tractor dealer in Casa Grande, Arizona. Two years later, a second branch was opened in Mesa, followed by a Yuma location in 1965. Today, the company’s 150 employees operate 11 branches that serve construction, agricultural and compact equipment customers throughout Arizona. Norm says: “As founder of Bingham Equipment Company in 1955, I felt then, as I do now, that sensitivity and understanding of customers’ needs have always been paramount in achieving a strong customer relationship.”

For 54 years, the Bingham Companies have been developing the power to help you succeed by delivering quality products and services from a location near you. Please stop by one of our dealerships soon and let us show you how “we are working hard to keep you working.” Our success flows from our dedication to providing the ultimate in service after the sale.

We offer a full line of agricultural equipment including:
- Tractors
- Combines
- Cotton Harvesting
- Hay and Forage
- Sprayers
- Planting and Seeding
- Tillage
- Material Handling
- Cutters and Shredders
- Scrapers
- Gator Utility Vehicles
- Engines
- Ag Management Solutions
- Home and Workshop Products

Bingham Equipment Company, 815 W. Gila Bend Hwy, Casa Grande, AZ 85222
www.binghamequipment.com
Our name, Bonita Bean is a tribute to the small hamlet of “Bonita”, a Spanish word meaning “beautiful”. A village established in 1872, Bonita is located in the Sulphur Springs Valley, surrounded by the Pinaleno, Galiuro, & Winchester Mountain Ranges.

A valley rich in history and in agriculture, where the footsteps of the famous Indian Chief Cochise, Colonel Henry C. Hooker, the Earp Brothers, and Billy the Kid still linger, is now home to Bonita Bean’s finest bean fields. Bonita, a “beautiful” jewel in the high desert where rich soil, pristine waters and ideal climate provide the perfect environment to grow pinto beans that are second to none.

Bonita Bean Company has been processing locally grown pinto beans since 1997. Our growers dot the Sulphur Springs valley from the north end in Bonita, to the Kansas Settlement in the center of the valley, where our bean plant is located, to the southernmost point near Elfrida, close to the border of Mexico.

Grown locally, our beans are also processed locally in our Kansas Settlement bean plant. Here, our beans are triple cleaned and processed to the highest quality standards in the industry. Locally grown and processed insures our promise of the freshest pinto bean in the marketplace. A commitment to quality is paramount to us at Bonita Bean. From production to processing to delivery, we believe our customers deserve superior, naturally produced pinto beans.

At Bonita Bean Company we are proud to be American Farmers, promoting agriculture and producing the highest quality food for the American public, and the world.
Briggs and Eggers Orchard

A Family Tradition
It all started when Joe and Jean Briggs began farming in the fertile Bonita Springs Valley in 1968. The 4,500-foot elevation, sunny days, cool nights, and plentiful supply of pure water create the perfect environment for growing deliciously sweet fruit! Melissa, and her husband, Lance Eggers, joined the family operation in 1993.

The pride in our orchard is reflected in every detail from the blossom on the tree to the apple in your hand. That’s why our fruit tastes so great. It’s the freshest, sweetest, tree-ripened fruit available anywhere!

Quality
At the Briggs & Eggers Orchards we are committed to producing the finest organic fruit available. This is achieved through personal involvement in every detail...from the first day of frost control to the final shipment of each box.

Joe can be found early on harvest mornings selecting fruit for picking. Sugar content, flavor and maturity are tested to determine when the fruit is at its peak of perfection. The fruit is then hand picked by crews who have worked with us for over 15 years.

Our fruit is packed in a state-of-the-art facility. They are washed with pure well water and then moved along a computerized line that weighs and optically scans the fruit for color. Computerized bagging machines provide uniform bag weight and gentle fruit handling. Lance and Melissa personally monitor the fruit throughout the packing and loading process.

Freshness
Thirty minutes after being picked, our fruit is moved to coolers. Most of our fruit is shipped within 48 hours of being packed. As a result, we offer the freshest, sweetest tree-ripened fruit available.

Growing Seasons

Briggs & Eggers Orchards
www.briggs-eggers.com
Caballero Dairy Farms

Dairy cows are treated like queens on Arizona dairy farms and Caballero Dairy Farms is no exception - it’s a high tech cow spa.

Owned and operated by the Caballero family, the dairy was started by Manuel and Dorothy Caballero in 1958 as a 90-cow operation in Mesa, AZ. Today it has grown to a 7500-head operation with 4400 of those cows being milked three times each day.

Cow comfort is an obvious priority at the facility and Caballero has invested millions of dollars in cooling the cows. Fans and misters adjust the atmosphere to keep the cows cool, while side curtains help keep the cool air inside. The milking parlor contains a state of the art milking carousels that has 72 stalls. By the time the carousel makes one complete revolution, milking

Sustainability is also important for Caballero Dairy. About 70% of the feed is grown on the family’s farming operation and feed storage and mixing takes place right there on the grounds. Environmental issues are a key element as the family works to protect the soil and water to provide a good home for their cows, their families and their communities.
Cienega Ranch

Cienega Ranch is a commercial cow calf operation. The ranch consists of approximately 35 sections of ranching land. Ranch is managed by a seasoned cattleman who has been in the business for 70 years. All cattle on the ranch are ranch-raised except the bulls that are purchased for breeding purposes. The operation runs at this time due to drought conditions 300 head of older cows and 75 to 100 head of first calf heifers. All cattle are electronically tagged as well as visually tagged. Animals are handled in a low stress environment. Cattle are rotated from pasture to pasture in a holistic range management rotation. Despite the many challenges facing the cattle industry, Cienega Ranch continually strives to improve the quality of cattle produced, while remaining a good steward of the lands. Our goal as a cattle ranch is to raise well cared for animals who are healthy and happy in their environment.

History of Cattle in Arizona
Father Kino brought the first known breeding herd of cattle to Arizona in the mid-1700s, introducing cattle husbandry and farming at San Xavier del Bac, just south of Tucson. By 1804, there were some 3,500 head of cattle around Tucson and an additional 1,000 near Tubac. Ranching in the region continued to expand with consumption of beef locally and exporting tallow and hides to Europe via South America. In 1822, approximately forty thousand hides, worth two dollars apiece, and one million pounds of tallow were exported.

Ranching at the Turn of the Century
At the time of Arizona’s statehood, there were approximately 915,000 head of cattle, quickly growing to 1,750,000 head roaming the range by 1918. Ranching in Arizona truly was the Wild West and faced many tests including drought, attacks, rustling, territorial disputes, and transportation challenges. Through struggles and adventures, lean times and prosperity, cattle ranching and raising beef have been an integral part of Arizona’s rich history.

Cattle Ranching in Arizona Today
In some ways, cattle ranching has not changed much in the last 100 years. Arizona ranching families care about conservation, they care about their animals, and most importantly, they care about the consumer, providing nutrient-rich beef for all to enjoy. They continue to raise safe, wholesome, and nutritious beef not only to feed their families and Arizonans, but also to fulfill export markets throughout the world. Beef provides zinc, iron, protein and other key nutrients in one powerful and delicious serving. Many ranching families have remained stewards of the land for longer than Arizona has been a state. Cattlemen and women care for the wildlife, the environment, and water resources while giving the utmost care to their animals.

Cienega Ranch, 9122 S. Hwy 186, Willcox, AZ 85643
Civano Nursery

Civano Nursery is a family owned and operated business. The nursery has been open since 1999 and we have gone through a lot of changes over the years. Running a business can be a challenge, but it has been one that we have enjoyed every step of the way. Now gone from single, to married, to driving kids in a minivan! Life has taught me the importance of having a place that you can shop at that has a little something for everyone. That’s why we have a play area for the little ones, a putting green for the older ones and an abundance of plants for the avid gardener. If you don’t feel like digging a hole, no problem! We can design it, deliver it, and plant it for you.

The majority of the plants found at our garden center have been grown by my younger brother Nick at our 70 acre Sahuarita farm. He really has a passion for plants, and it shows in the quality and variety of plants that he chooses for each season. He has propagated some great new trees for smaller spaces: the Leslie Roy Mesquite (named after Dad), The Sweet Katie Burgundy Desert Willow (named after Nick’s wife), and The Doris D Willow Acacia (named after Mom).

How did we get here? Well it all started with our Dad Les Shipley, who taught us the value of a hard day’s work and the joy of growing plants. At a very young age my brothers and I could be found running through the greenhouses or potting up plants. We’ve just always been exposed to agriculture and the joy of growing plants. Now it’s our turn to pass it down to our children and teach them what our father taught us. That’s why we strive to provide a family atmosphere that enlightens, inspires, and ultimately guides you to a successful garden.

We also do our part to care for the environment and participate in our community. Civano Nursery has partnered with Tucson Electric and Power to gather tree limbs and brush trimmed from around utility poles and power lines that are then used to make compost. We also take pride in the fact that we recycle used plant containers, just another way we reduce waste in our landfills.

We truly love what we do, and our garden professionals are as passionate as we are about gardening. If you want to learn more about gardening in our climate come down to Civano Nursery and let us show you how.
The Curry Seed & Chile Company, which was founded 33 years ago by native Arizonan Edward Curry, is a 1,200 acre farm operation nestled among the fields of the Sulphur Springs Valley in the small town of Pearce in southeastern Arizona.

Ed’s love for chiles began at a very early age when his parents planted their first chile crop in 1957. He essentially grew up in the chile fields. His passion for chiles continued to grow into what eventually became a lifelong interest in chile genetics. For 25+ years, he worked closely with his partner, Phil Villa, a well-known chile breeder, in developing new and improved hybrids that can be produced with uniform quality, flavor and heat. Careful plant breeding also resulted in improving certain strains of chiles that are now producing nearly double their average yield. The seed from these hybrid chiles come with pedigrees and with care and feeding guidelines to ensure that growers using Curry’s seeds earn the best yield possible.

Ed Curry continues to work extensively in chile genetics. In the farming industry, it is said that the genetic origins for 80 – 90 percent of the chiles grown commercially in the U.S. can be traced back to Curry’s farm in Arizona. The Curry Seed & Chile Company supplies chile seed to growers in the Southwestern U.S. and in several states in Mexico.

The Curry Seed & Chile Company's seed are of exceptional quality. We proudly offer a fine selection of seed from a wide range of red and green chile varieties with their unique flavors in three heat levels – HOT, MEDIUM and MILD.

Guinness World Record for Curry Farms
On November 6th, 2009 the prestigious Guinness World Records Ltd organization awarded Ed Curry, of Curry Farms, a Certificate specifying "The heaviest pepper is 0.29 kg (.063 lb), grown by Edward Curry (USA) at Curry Farms in Pearce, Arizona, United States, and measured on 6 November 2009."
Dairy Council® of Arizona
Arizona Milk Producers

Dairy Council® of Arizona is a nonprofit nutrition education organization funded by Arizona’s milk producers and is an affiliated unit of National Dairy Council®. We strive to provide you with the latest in nutrition research and educational materials to help make your job easier. We offer a wide range of scientifically based education materials for all age groups, from pre-school through adult audiences. As a leader in nutrition education services in Arizona, we provide information on current nutrition issues such as calcium needs, osteoporosis, hypertension, weight management, lactose intolerance, dental health, and general nutrition. All Dairy Council of Arizona nutrition education materials are based on the MyPyramid Food Guidance System. Some of our materials are also available in Spanish.

No school wellness policy can be complete without incorporating nutrition education into the plan. Dairy Council of Arizona provides nutrition curriculum packages for several grade levels, as well as other nutrition education materials you can use to help you implement the best wellness policy you can. Dairy Council of Arizona is proud to provide these award winning, age-specific nutrition education materials throughout the state at no charge.

Arizona Milk Producers is the advertising and promotion arm of the organization, dedicated to promoting the benefits of milk and dairy foods to consumers. One aspect of this promotion is to highlight the importance of agriculture in the state and how dairy farmers care for their land and animals.

Arizona’s dairy farmers are committed to providing you and your family with wholesome milk and dairy products. This commitment starts on the farm with top-notch animal care and extends across the supply chain - from the milk tanker trucks to the processing plant to the grocery store - to ensure that the dairy foods you enjoy each day are as wholesome and pure as nature intended.

Dairy farmers work hard every day to bring you fresh, great tasting, milk products. Most dairies are family-owned, and as active members of their communities, farm families take pride in maintaining natural resources. That means preserving the land where they live and work, protecting the air and water they share with neighbors, and providing the best care for their cows - the life-blood of their business.

Dairy Council of Arizona
www.dairycouncilofaz.org
Maricopa County Farm Bureau

Maricopa County Farm Bureau (MCFB) is a grassroots membership organization dedicated to promoting and defending agriculture in a county with nearly 4 million residents. A non-profit organization governed by an elected board of directors who are local agriculture producers, MCFB concentrates its efforts on four areas: representing agriculture in local and county legislative and regulatory actions; education and communication; member benefits; and developing leaders for the agriculture industry.

MCFB is one of the 13 county Farm Bureaus that make up the Arizona Farm Bureau Federation.

As part of our educational outreach, MCFB helps organize such public events as Arizona Agriculture Day, and a children’s activity called “Farmer for a Day” at the Maricopa County Fair. Our farmers are also seen on media features that show the real source of food, fiber and ornamental plants.

Our Ag in the Classroom program includes a partnership with the University of Arizona Extension, Maricopa County, to bring presentations to your school to help your students learn about the plants and animals that provide all the food they eat, most of the clothes they wear, the materials to build their homes and the ornamental plants and trees that make their homes and properties beautiful.

MCFB originated the popular “How to Grow a Pizza” traceback exercise that shows how many farms it takes to provide the ingredients for pizza. Schedule “How to Grow a Pizza” presentations for your school by calling MCFB at 602-437-1330 or Brandon Moak at the Extension office, 602-827-8200, ext. 389.

Farm Bureau is an “umbrella” organization that covers all aspects of agriculture – large and small production facilities growing everything from cilantro to horses and shrimp, from dairy cattle to hay and zucchini. That’s why we call ourselves “The Voice of Agriculture.”
Pinal Energy, LLC

Pinal Energy LLC, a privately held company, is proud to be the first ethanol production facility to be built in Arizona. The facility began production in August, 2007. The plant plays an important role in improving Arizona’s air quality, provides 45 jobs for the Maricopa area and, most importantly, makes a local source of ethanol available. Pinal Energy’s annual ethanol production rate is 50 million gallons from roughly 18 million bushels of grain acquired from both local producers as well as from the Midwest. The fuel-grade ethanol is used in blending with gasoline components to produce E10, a 10% ethanol blend. Ethanol produced at the plant is also used for blending E85, a clean-burning blend of 85% ethanol and 15% gasoline for use in flex fuel vehicles. Production of ethanol results in two other commercially viable by-products: distiller’s grain and CO2. Distiller’s grain is a feed utilized by dairies and feedlots. The CO2 produced is captured and recycled for use in the Arizona soft drink, dry ice, and hydroponics industries.

What is Ethanol?

Ethanol is a high octane, liquid, domestic and renewable fuel, produced by the fermentation of plant sugars. In the United States, ethanol is typically produced from milo and other grain products, although in the future it may be economically produced from other biomass resources such as agricultural and forestry wastes or specially grown energy crops.

- Ethanol reduces the incidence of greenhouse gas emissions.
- Ethanol is domestically produced and promotes energy independence.
- Ethanol production increases the value of feed grains grown by farmers.
- Ethanol is biodegradable and does not contaminate water.
- Ethanol can be produced from a number of different feedstocks including paper and agricultural waste.

The United States faces many challenges as our consumption of gasoline increases. While ethanol alone will not solve these challenges, it can play a significant role in an overall solution.

Reduces Dependence on Foreign Countries

In the year 2000, for the first time in our history, the US imported more foreign oil than we produced domestically. As our gasoline consumption continues to increase, our dependence on foreign nations is also projected to increase. Most people agree that something must be done to reverse this trend.

Ethanol blended into our gasoline extends our fuel supply, which reduces the amount of oil the US must import. Since ethanol is produced from domestically grown crops, utilizing our own resource shifts some of this dependence back to the United States.

Renewable Energy

As our gasoline consumption grows, the search for new oil resources expands. To gain access to these precious reserves, we are drilling deeper into our oceans and threatening to destroy our protected lands. The pristine wilderness lost may never be restored, and it will take literally millions of years to replace these oil sources. Ethanol is produced from a variety of organic materials replanted or renewed annually.

Portions that are not converted to ethanol are dried and sold as premium, high-protein cattle feed. CO2 is another useable and marketable byproduct.
Pinal Feeding Company

Started in 1959, Pinal Feeding Company is one of the largest cattle feeding operations in the southwest. We have several feeding yards located throughout Pinal County, Arizona with capacity for over 150,000 head of cattle.

Our affiliate companies include Northside Hay Company, Sacate Pellet Mills, and Red River Cattle Company.
Jim Cook’s family has ranted and farmed in Arizona since the 1880’s. In 1973, he began farming pistachios, a new crop in the area. He raised his sons, Mark and Michael, farming alongside with him and now they’re all farming their own land as well as managing the farms of others in Southeastern Arizona.

Growing American Pistachios
The pistachio tree (pistacia vera) originated in western Asia and Asia Minor, made its way into Mediterranean Europe and now thrives in the dry climates of the American west. Advanced production technologies, efficient harvesting and sophisticated growing techniques now make the United States #1 in global commercial production.

Harvesting
Harvest takes place anywhere from late August to early October. Between 5 and 7 years of age, the pistachio tree begins bearing fruit (yes, it’s a drupal). A biennial bearer (a heavy crop one year and little crop the next), there appears to be no upper age limit to a tree’s viability. Once ripened, the nuts are quickly harvested, cleaned, sorted and roasted for the perfect snack or for ingredient usage.

Nature decides when it’s time to harvest pistachios. In the American West, harvest occurs in September or October when the fruit is mature and the shell has split. For American Pistachio Growers, the year’s work culminates in the highly coordinated effort between our member growers and processors to harvest and deliver the crop quickly and efficiently. This process ensures the highest quality pistachios year after year,
Salt River Project

SRP, based in Phoenix, was established in 1903 as the nation’s first multipurpose reclamation project authorized under the National Reclamation Act. Today, SRP is the nation’s third-largest public power utility and one of Arizona’s largest water suppliers, providing power to customers throughout a 2,900-square-mile service territory in central Arizona.

SRP is two entities: the Salt River Project Agricultural Improvement and Power District, a political subdivision of the state of Arizona; and the Salt River Valley Water Users’ Association, a private corporation.

The District provides electricity to about 920,000 retail customers in the greater Phoenix metropolitan area. It operates or participates in 11 major power plants and numerous other generating stations, including thermal, nuclear, natural gas and hydroelectric sources.

The Association delivers nearly 1 million acre-feet of water annually to a service area in central Arizona. An extensive water delivery system is maintained and operated by the Association, including reservoirs, wells, canals and irrigation laterals.

**SRP addresses issues in education**

Education is the key to our future, and SRP annually contributes more than $1.3 million to education initiatives, grants and partnerships throughout Arizona. SRP is pleased to offer an array of complementary educational resources in support of Arizona educational standards. These resources are on the topics of energy, water and the environment. Complete the online order form at www.srpnet.com/education or call (602) 236-2484 to request these materials.
The William J. Parker Agricultural Research Center is a one-of-a-kind environmental control facility that is unique in that it combines state-of-the-art environmental control capabilities, including solar radiation, for heat stress with the ability to simultaneously study expression of over 20,000 individual genes in cattle and sheep.

The building includes environmental rooms that can mimic any climate or heat cycle, surgery suites and laboratory facilities. Phase II of the facility was complete in September, 2006 and a third phase is slated for construction in the future.

Directions: This facility is just a short 4 mile drive from main campus. To reach the facility from the main campus, take Speedway Boulevard east to Campbell Avenue. Drive north on Campbell Avenue 3.5 miles to Roger Road. Turn left onto Roger and then take the first right turn into the Campus Agricultural Center.
U of A Cooperative Extension
Maricopa County

Cooperative Extension plays a unique role in both urban and rural areas of the state. Extension provides practical information and education to help people make their lives better. Outreach efforts translate relevant University of Arizona research into effective practices people can put to immediate use in their homes and businesses.

Programs are conducted by the University of Arizona College of Agriculture and Life Sciences Cooperative Extension faculty in each county office and by campus-based Extension Specialists. Faculty members – Extension Agents – form partnerships with community groups and with trained volunteers to bring the university to the people.

Cooperative Extension programs address key quality of life issues pertaining to Animals; Environment & Natural Resources; Family, Youth & Community; Marketing, Trade & Economics; Nutrition, Food Safety & Health; and Plants.

Creating a Better Environment for Families and Consumers: Healthy people are better able to contribute to a robust economy. Cooperative Extension programs are designed to strengthen families, promote healthy lifestyles and wise financial decisions and develop community leaders. Programs are offered at community centers, churches, and other venues to reach diverse audiences.

4-H Youth Development: Youth ages 5-19 can be involved in more than 100 educational projects that are offered through 4-H. 4-H uses experiential learn-by-doing projects, meetings, community service and a variety of educational experiences to teach life skills while having fun. 4-H is young people and adults growing together to become informed, educated citizens.

Agriculture and Natural Resources: Extension promotes environmental stewardship through Horticulture, Field Crops, Turfgrass and Invasive Species programs. The Water Sustainability programs create quality interactive learning experiences to promote responsible water stewardship, including conservation.

Cooperative Extension has offices across the state, in counties and on Indian Reservations, that can be accessed through the web site cals.arizona.edu/extension. These offices are located in:

- Apache (St. Johns)
- Cochise (Willcox & Sierra Vista)
- Coconino (Flagstaff)
- Gila (Payson & Globe)
- Graham (Solomon)
- Greenlee (Duncan)
- La Paz (Parker)
- Maricopa (Phoenix)
- Mohave (Kingman)
- Navajo (Holbrook)
- Pima (Tucson & Sahuarita)
- Pinal (Casa Grande)
- Santa Cruz (Nogales)
- Yavapai (Prescott & Cottonwood)
- Yuma (Yuma)
- Colorado River Indian Tribes (Parker)
- Hopi Tribe (Keams Canyon)
- Navajo Nation (Window Rock & Shiprock)
- Hualapai Nation (Peach Springs)
- San Carlos Apache (San Carlos)

U of A Cooperative Extension, Maricopa County, 4341 E. Broadway, Phoenix, AZ 85040
http://extension.arizona.edu/maricopa.
U of A Maricopa Agriculture Center

As one of the major centers of the Arizona Agricultural Experiment Station, the Maricopa Agricultural Center strives to be at the forefront of disciplinary field investigations, to develop, deliver and service the best appropriate integrated agricultural technologies for all problems faced by Arizona consumers and producers, and to provide assistance to all scientists conducting their research and educational outreach programs. The Center not only provides facilities and support for extension outreach programs, but also provides support and facilities for teaching University classes and Ag-Literacy to all age groups.

The **MAC Farm Ag-Ventures** educational programming includes a combination of videos, educational presenters, hands on learning experiences and trailer rides around certain parts of the 2100 acre farm for a first hand view of what makes a working plant farm work. Our philosophy is for students to learn and to have a fun time learning about the source of our food and fiber.

**Nutrition Ag-Ventures - (September-October, March-May)**
In this “food comes from the farm series”, students learn how many farms it takes to make a pizza. As pizza is the most popular item of choice among today’s youth, students learn about how plants grow and all the work it takes to bring healthy, nutritious food to the table. Classroom activities are provided to help further the Ag-Literacy experience.

**Amazing Corn Festival - (October, November)**
For thousands of years, corn has been a major staple in our diets. We have grown, ground, and gobbled it down! Students participate in a variety of educational activities ranging from harvesting, grinding and tasting corn products to corn art.

**Desert Ag-Ventures - (January, February)**
During the months of January and February, a special series titled ‘Desert Ag-Ventures' opens up to let seniors and winter visitors learn about arid land agriculture. Most of the world’s agriculture takes place in arid environments, so this is a great opportunity for adults from around our nation and Canada to learn about and experience Arizona’s agriculture in a fun way.

**Water & Science Ag-Ventures - (February)**
Junior high school and high students participate in a cooperative effort with U.S. Water Lab research scientists, community supporters and MAC to learn about the science and technologies being applied in agriculture today. In addition to experiencing various rotating workshop presenters, students also get an opportunity to learn about aquaculture in addition to trying their hand as using siphon tubes in the fields.

**Garden Ag-Ventures - (March, April, May)**
Vegetables are an important part of our diet. Elementary students learn about nutrition, growing techniques, effects of weather, insects, & have the chance to harvest vegetables (depending on harvest conditions.)

For program reservations contact Victor Jimenez at (520) 568-2273 or vjimenez@ag.arizona.edu.
University of Arizona
Meat Science Laboratory

The University of Arizona Meat Science Laboratory is a state of the art, USDA inspected processing facility with full harvesting facilities, meat lockers and an interactive auditorium classroom connected to the meat lockers that allows instructors to use actual carcasses and demonstrate processing techniques in the classroom for instruction in meat science and food safety.

The U of A Meat Science facility is the only one of its kind at a University in the Southwest.

Classes taught at the Meat Science Complex include:
   - ANS 102 Lab - Introduction to Animal Industry Laboratory
   - ANS 320 - Food Safety
   - ANS 380 - Meat Animal Composition

Meat Sales:
The University of Arizona Meat Science Lab offers various beef, lamb and pork products for sale to the general public through the Collegiate Cattle Growers Association. For available products, meat sale days, times and prices go to the CCGA Meats website at http://www.ccgameats.com/index.html.

U of A Meat Science Laboratory, 4181 N. Campbell Ave. Tucson, AZ 85719
http://ag.arizona.edu/ANS/meat_sci_lab.html
USDA Arid Lands Research Center

The U.S. Arid-Land Agricultural Research Center integrates the former Western Cotton Research Laboratory and the U.S. Water Conservation Laboratory on a 20-acre site at the University of Arizona, Maricopa Agricultural Center. The 97,000 ft² research center houses 26 research scientists and over 90 research and administrative support personnel. The mission of the research center is to develop sustainable agricultural systems, protect natural resources, and support rural communities in arid and semi-arid regions through interdisciplinary research. Research topics include crop management, integrated pest management, irrigation technology, remote sensing, water reuse, crop breeding and physiology, and global climate change. The facility opened in February 2006.

Water Management and Conservation Research
Irrigated agriculture is the major user of water in the western United States. While water is considered a renewable resource, it is often in short supply or of poor quality. Increasing demands are being made on limited water supplies by agriculture, cities, and industries. Thus, the objectives of the Water Management and Conservation Research Unit are to develop management strategies and physical hardware needed to attain the most efficient use of irrigation water, to protect groundwater in areas where agricultural practices would have the potential for degrading water quality, and to reuse wastewater.

Research Projects:
• Water Management in Arid Irrigated Agriculture
• Remote Sensing for Crop and Water Management in Arid Irrigated Agriculture
• Reuse of Treated Municipal Waste Water for Irrigation

Plant Physiology and Genetic Research Unit
The mission of the Plant Physiology and Genetic Research Unit is to increase the productivity, profitability and sustainability of agriculture in arid environments by developing new germplasm for both traditional and alternative crops and by improving plant responses to abiotic stresses and to changes in the global environment. Research is conducted under three major projects:
• Physiological and Genetic Basis of Cotton Acclimation to Abiotic Stress
• Commercialization of New Industrial Crop Germplasm and Cropping Systems
• Predicting Impacts of Climate Change on Agricultural Systems and Developing Potentials For Adaptation

Pest Management and Biological Control Research Unit
The mission of the Pest Management and Biocontrol Research unit is to develop unique and improved biological, behavioral, cultural, and genetic based methods to reduce losses by insects and mites affecting crops in arid land production areas of the U.S. The goals are economically, socially and environmentally acceptable pest population suppression technologies based on the use of behavioral chemicals, genetics, cultural practices, biological control, sampling and decision aids, modeling and population dynamics of pests and their natural enemies. Emphasis is placed on development of fully integrated, ecologically-based management strategies in a changing agricultural environment that includes recognition of the agriculture-urban interface.

USDA Arid Lands Research Center
http://www.ars.usda.gov/Main/site_main.htm?modecode=53-47-00-00
Willcox Livestock Auction, Inc.

Cattle are our business!!

Arizona is home to five livestock auction houses with four of those five exclusively selling cattle. In general, an auction is a place to trade a good and reach an agreed value between buyer and seller in the shortest time possible. At a livestock auction the goods traded can be cattle, horses, sheep, hogs, goats, or lambs. An auctioneer is employed to take bids on the goods presented for sale and his or her job is to get the most money possible for that item. After a short session of bid taking, the auctioneer ends the bidding and determines who acquires the item from who placed the last and highest bid.

The livestock auction is one that relies on supply and demand to continue staying in business. Most auction houses draw consigners and buyers from the local area surrounding the auction house. When supply and demand equals each other fair market value is reached. The auction houses and auctioneer help this process along by getting it done in a matter of minutes.

The Willcox Livestock Auction has been in the business of selling cattle for over 50 years. Every Thursday, anywhere from 800 to 1000 animals are sold. Every week after the auction has concluded, a weekly market report is compiled listing information such as how much the cattle sold for on average which depends on weight, sex, and age. This report helps give an estimate of how the cattle market will look in the week to come and assist buyers and sellers in making their decisions to purchase or sell cattle.
<table>
<thead>
<tr>
<th>BOOK</th>
<th>AUTHOR</th>
<th>ISBN NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventures of 100% Happy Shirt, The</td>
<td>Murphree, Pennee</td>
<td>096461880X</td>
</tr>
<tr>
<td>Agriculture for ME</td>
<td>Grenier, Willie Sawyer</td>
<td>agclassroom.org/ME</td>
</tr>
<tr>
<td>All Kinds of Farms</td>
<td>Shepard, Daniel</td>
<td>736829121</td>
</tr>
<tr>
<td>All the Places to Love</td>
<td>MacLachlan, Patricia</td>
<td>0060210982</td>
</tr>
<tr>
<td>Amazing Grazing</td>
<td>Peterson, Cris</td>
<td>156397942X</td>
</tr>
<tr>
<td>American Family Farm, The</td>
<td>Anderson, Joan &amp; Acona, George</td>
<td>0152014810</td>
</tr>
<tr>
<td>American Farmer</td>
<td>Mobley, Paul &amp; Fried, Katrina</td>
<td>1599620472</td>
</tr>
<tr>
<td>An Amish Year</td>
<td>Ammon, Richard</td>
<td>9781590784655</td>
</tr>
<tr>
<td>Ancient Agriculture: From Foraging to Farming</td>
<td>Woods, Michael &amp; Mary B.</td>
<td>0822529955</td>
</tr>
<tr>
<td>Animal, Vegetable, Miracle</td>
<td>Kingsolver, B; Kingsolver, C; &amp; Hopp, S.L.</td>
<td>0060852569</td>
</tr>
<tr>
<td>Animals on The Farm</td>
<td>Brampton, Bob</td>
<td>1858544424</td>
</tr>
<tr>
<td>Apples</td>
<td>Gibbons, Gail</td>
<td>0823414973</td>
</tr>
<tr>
<td>Apples to Oregon</td>
<td>Hopkinson, Deborah &amp; Carpenter, Nancy</td>
<td>0689847696</td>
</tr>
<tr>
<td>Aristocrat in Burlap: A History of the Potato in Idaho</td>
<td>Davis, James W.</td>
<td>0991723244</td>
</tr>
<tr>
<td>Arizona Rangers</td>
<td>DeSoucy, M. David &amp; Trimble, Marshall</td>
<td>0738548316</td>
</tr>
<tr>
<td>Barn Burner, The</td>
<td>Willis, Patricia</td>
<td>439305284</td>
</tr>
<tr>
<td>Beef Princes of Practical County, The</td>
<td>Houts, Michelle</td>
<td>9780440422709</td>
</tr>
<tr>
<td>Benny Broccoli &amp; His Buddies</td>
<td>American Crop Protection Association</td>
<td><a href="http://www.croplifeamerica.org">www.croplifeamerica.org</a></td>
</tr>
<tr>
<td>Big Moon Tortilla</td>
<td>Cowley, Joy</td>
<td>9781590780374</td>
</tr>
<tr>
<td>Biggest Pumpkin Ever, The</td>
<td>Kroll, Steven</td>
<td>590411136</td>
</tr>
<tr>
<td>Black Stallion, The</td>
<td>Farley, Walter</td>
<td>0679813438</td>
</tr>
<tr>
<td>Blue Potatoes, Orange Tomatoes</td>
<td>Creasy, Rosalind</td>
<td>871565765</td>
</tr>
<tr>
<td>Brave Dogs Gentle Dogs</td>
<td>Urbigkit, Cat</td>
<td>9781590786741</td>
</tr>
<tr>
<td>Burro's Tortillas</td>
<td>Fields, Terri</td>
<td>9781934359181</td>
</tr>
<tr>
<td>Can A Rooster Drive a Tractor</td>
<td>Murphy, B.R. &amp; Richardson, S.P.</td>
<td>971441901</td>
</tr>
<tr>
<td>Cattle Kids</td>
<td>Urbigkit, Cat</td>
<td>9781590785089</td>
</tr>
<tr>
<td>Century Farm</td>
<td>Peterson, Cris</td>
<td>1563977710</td>
</tr>
<tr>
<td>Children Just Like Me</td>
<td>Kindersley, Barnabas &amp; Anabel</td>
<td>789402017</td>
</tr>
<tr>
<td>Corn</td>
<td>Gibbons, Gail</td>
<td>9780823421695</td>
</tr>
<tr>
<td>Corn Belt Harvest</td>
<td>Bial, Raymond</td>
<td>395562341</td>
</tr>
<tr>
<td>Cotton, Now and Then</td>
<td>Willing, K. &amp; Dock, J.</td>
<td>964182033</td>
</tr>
<tr>
<td>Cowful of Cowboy Poetry, A</td>
<td>Black, Baxter</td>
<td>939343304</td>
</tr>
<tr>
<td>Coyote School News</td>
<td>Sandin, Joan</td>
<td>0805065558X</td>
</tr>
<tr>
<td>Crosswire</td>
<td>Enderle, Dotti</td>
<td>9781590787519</td>
</tr>
<tr>
<td>Day in the Life of a Farmer, A</td>
<td>Adamson, Heather</td>
<td>9780736846745</td>
</tr>
<tr>
<td>Days on the Farm</td>
<td>Lewis, Kim</td>
<td>760762635</td>
</tr>
<tr>
<td>Desert Gardening for Beginners</td>
<td>Cromwell, C.; Guy, L. A.; &amp; Bradley, L. K.</td>
<td>965198723</td>
</tr>
<tr>
<td>Desert Landscaping for Beginners</td>
<td>Arizona Master Gardeners</td>
<td>965198731</td>
</tr>
<tr>
<td>Desert Water Gardening for Beginners</td>
<td>Cromwell, Cathy</td>
<td>9780965198752</td>
</tr>
<tr>
<td>Digging Deeper, Integrating Youth Gardens</td>
<td>Kiefer, J. &amp; Kemple, M.</td>
<td>188443004X</td>
</tr>
<tr>
<td>Dirty Life On Farming, Food, and Love, The</td>
<td>Kimball, Kristin</td>
<td>9781416551607</td>
</tr>
<tr>
<td>Disappearing Earth, The</td>
<td>Peterson, Doug</td>
<td>1883097274</td>
</tr>
<tr>
<td>Dr. Bird to the Rescue</td>
<td>Smith, D. J.</td>
<td>1932082085</td>
</tr>
<tr>
<td>Earth-Friendly Desert Gardening</td>
<td>Cromwell, C.; Miller, J.; &amp; Bradley, L. K.</td>
<td>96519874X</td>
</tr>
<tr>
<td>Eat 'um!</td>
<td>Oahu Head Start Program</td>
<td>Oahu Head Start</td>
</tr>
<tr>
<td>Everybody Bakes Bread</td>
<td>Dooley, Norah</td>
<td>087614864X</td>
</tr>
</tbody>
</table>
### SAI Suggested Reading List (cont.)

<table>
<thead>
<tr>
<th>BOOK</th>
<th>AUTHOR</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Cheese, Please!</td>
<td>Peterson, Cris</td>
<td>1563971771</td>
</tr>
<tr>
<td>Fall is Here! I Love It!</td>
<td>Good, Elaine W.</td>
<td>1561481424</td>
</tr>
<tr>
<td>Farm Animals, Chickens</td>
<td>Bell, Rachael</td>
<td>1575725304</td>
</tr>
<tr>
<td>Farm Animals, Cows</td>
<td>Bell, Rachael</td>
<td>1575725290</td>
</tr>
<tr>
<td>Farm Animals, Horses</td>
<td>Bell, Rachael</td>
<td>1575725312</td>
</tr>
<tr>
<td>Farm Animals, Pigs</td>
<td>Bell, Rachael</td>
<td>1575725320</td>
</tr>
<tr>
<td>Farm Animals, Sheep</td>
<td>Bell, Rachael</td>
<td>1575725339</td>
</tr>
<tr>
<td>Farm Animals, Turkeys</td>
<td>Bell, Rachael</td>
<td>1575725347</td>
</tr>
<tr>
<td>Farm Life</td>
<td>Spurr, Elizabeth</td>
<td>0439657180</td>
</tr>
<tr>
<td>Farmer George Plants a Nation</td>
<td>Thomas, Peggy</td>
<td>9781590784600</td>
</tr>
<tr>
<td>Farming</td>
<td>Gibbons, Gail</td>
<td>0823406822</td>
</tr>
<tr>
<td>Food</td>
<td>McDonald, Fiona</td>
<td>0778702383</td>
</tr>
<tr>
<td>Food and Farming</td>
<td>Kindersley, Dorling</td>
<td>1564583872</td>
</tr>
<tr>
<td>From Seed To Plant</td>
<td>Gibbons, Gail</td>
<td>9780823408726</td>
</tr>
<tr>
<td>Fruit Is A Suitcase For Seeds, A</td>
<td>Richards, Jean</td>
<td>9780761316220</td>
</tr>
<tr>
<td>Fun With GPS</td>
<td>Cooke, Donald</td>
<td>1589480872</td>
</tr>
<tr>
<td>Future of Food, The</td>
<td>Pardey, Philip G.</td>
<td>0896297098</td>
</tr>
<tr>
<td>G is For Grand Canyon</td>
<td>Gowan, Barbara</td>
<td>1585360686</td>
</tr>
<tr>
<td>Garden Genetics</td>
<td>Rice, Elizabeth; Krasney, M.; &amp; Smith, M.</td>
<td>9780873552646</td>
</tr>
<tr>
<td>Giant Cabbage, The</td>
<td>Stithler, Cherie B.</td>
<td>1570613575</td>
</tr>
<tr>
<td>Goat in The Rug, The</td>
<td>Blood, Charles &amp; Link, Martin</td>
<td>0689714181</td>
</tr>
<tr>
<td>Grow Your Own Pizza</td>
<td>Hardesty, Constance</td>
<td>1555913989</td>
</tr>
<tr>
<td>Growing Apples and Pumpkins</td>
<td>Hutchings, Amy &amp; Richard</td>
<td>0439223520</td>
</tr>
<tr>
<td>Growing Ventures</td>
<td>National Gardening Association</td>
<td>0915873451</td>
</tr>
<tr>
<td>GrowLab, Revised Edition</td>
<td>National Gardening Association</td>
<td>0915873470</td>
</tr>
<tr>
<td>Harvest Song</td>
<td>Fiorello, Frank</td>
<td>0964630087</td>
</tr>
<tr>
<td>Harvest Time</td>
<td>Cipriano, Jeri</td>
<td>0736828850</td>
</tr>
<tr>
<td>Harvest Year</td>
<td>Peterson, Cris</td>
<td>1563975718</td>
</tr>
<tr>
<td>Heartland</td>
<td>Siebert, Diane</td>
<td>0690047304</td>
</tr>
<tr>
<td>Heartstrings and Tail-Tuggers</td>
<td>Porter, Penny</td>
<td>1893660109</td>
</tr>
<tr>
<td>Horsepower, The Wonder of Draft Horses</td>
<td>Peterson, Cris</td>
<td>1563976269</td>
</tr>
<tr>
<td>How a Seed Grows</td>
<td>Jordan, Helene J.</td>
<td>0060201045</td>
</tr>
<tr>
<td>Hungry Planet</td>
<td>Menzel, Peter &amp; D’Aluisio, Faith</td>
<td>9781580086813</td>
</tr>
<tr>
<td>Ice Cream The Full Scoop</td>
<td>Gibbons, Gail</td>
<td>9780823421558</td>
</tr>
<tr>
<td>If America Were a Village</td>
<td>Smith, D. J.</td>
<td>9781554533442</td>
</tr>
<tr>
<td>If it Weren’t for Farmers</td>
<td>Fowler, Allan</td>
<td>0516060090</td>
</tr>
<tr>
<td>If the World Were a Village</td>
<td>Smith, David J.</td>
<td>9781550747799</td>
</tr>
<tr>
<td>Insects of the Southwest</td>
<td>Werner, Floyd &amp; Olsen, Carl</td>
<td>1555610609</td>
</tr>
<tr>
<td>Investigating Plants</td>
<td>Sinclaire, T.R. &amp; Johnson, Marty</td>
<td>0941212211</td>
</tr>
<tr>
<td>It's Summertime!</td>
<td>Good, Elaine W.</td>
<td>1561481440</td>
</tr>
<tr>
<td>Jeremy Jackrabbit Harvests the Rain</td>
<td>Glassman, Sasha &amp; Rodney</td>
<td>9780981461618</td>
</tr>
<tr>
<td>Johnny Appleseed</td>
<td>Kellogg, Steven</td>
<td>0590426168</td>
</tr>
<tr>
<td>Johnny Appleseed</td>
<td>Lindbergh, Reeve</td>
<td>0316526347</td>
</tr>
<tr>
<td>Johnny Appleseed</td>
<td>Moore, Eva</td>
<td>0590420278</td>
</tr>
<tr>
<td>Johnny Appleseed-My Story</td>
<td>Harrison, David L.</td>
<td>0375812474</td>
</tr>
</tbody>
</table>
### SAI Suggested Reading List (cont.)

<table>
<thead>
<tr>
<th>BOOK</th>
<th>AUTHOR</th>
<th>ISBN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kids Around The World Celebrate</td>
<td>Jones, Lynda</td>
<td>047134527X</td>
</tr>
<tr>
<td>Kids Container Gardening</td>
<td>Krezel, Cindy</td>
<td>1883052432</td>
</tr>
<tr>
<td>Last Child in the Woods</td>
<td>Louv, Richard</td>
<td>9781565125223</td>
</tr>
<tr>
<td>Laura Ingalls Wilder</td>
<td>Mara, Wil</td>
<td>0516278401</td>
</tr>
<tr>
<td>Leah's Pony</td>
<td>Friedrich, Elizabeth</td>
<td>1563978288</td>
</tr>
<tr>
<td>Little Joe</td>
<td>Wallace, Sandra Neil</td>
<td>9780375860973</td>
</tr>
<tr>
<td>Little Red Hen, The</td>
<td>Galdone, Paul</td>
<td>0395288037</td>
</tr>
<tr>
<td>Little Star...Raising Our First Calf</td>
<td>Chaney, Rianna &amp; Sheridan</td>
<td>9780981846804</td>
</tr>
<tr>
<td>Living on Farms</td>
<td>Fowler, Allan</td>
<td>0516270850</td>
</tr>
<tr>
<td>Loaves of Fun</td>
<td>Harbison, Elizabeth M.</td>
<td>1556523114</td>
</tr>
<tr>
<td>Los Tre Pequenos Jabalies</td>
<td>Lowell, Susan</td>
<td>9780873586610</td>
</tr>
<tr>
<td>Man Who Fed the World, The</td>
<td>Hesser, Leon</td>
<td>9780981848662</td>
</tr>
<tr>
<td>Material World</td>
<td>Menzel, Peter</td>
<td>0871564300</td>
</tr>
<tr>
<td>Math in the Garden</td>
<td>National Gardening Association</td>
<td>091587346X</td>
</tr>
<tr>
<td>Midnight Farm, The</td>
<td>Lindbergh, Reeve</td>
<td>0803703317</td>
</tr>
<tr>
<td>Mini Milk Maids on the Mooove</td>
<td>Chaney, Rianna &amp; Sheridan</td>
<td>9780981846811</td>
</tr>
<tr>
<td>Mom When Will it be Halloween?</td>
<td>Fiorello, Frank</td>
<td>0964630044</td>
</tr>
<tr>
<td>Oh Say Can You Seed</td>
<td>Worth, Bonnie</td>
<td>0375810951</td>
</tr>
<tr>
<td>On the Farm</td>
<td>Cherrington, Janelle</td>
<td>0439679982</td>
</tr>
<tr>
<td>One Grain of Rice</td>
<td>Demi</td>
<td>059093998X</td>
</tr>
<tr>
<td>Our Farm</td>
<td>Stango, Diane E.</td>
<td>0823981177</td>
</tr>
<tr>
<td>Our Favorite Stories From Around the World</td>
<td>Gavin, Jamila</td>
<td>0789414864</td>
</tr>
<tr>
<td>Our Super Garden</td>
<td>Nagro, Anne</td>
<td>9780982498651</td>
</tr>
<tr>
<td>Painted House, A</td>
<td>Grisham, John</td>
<td>038550120X</td>
</tr>
<tr>
<td>Pigs &amp; Pork in the Story of Agriculture</td>
<td>Anderson, Susan &amp; Buggey, JoAnne</td>
<td>9781926781013</td>
</tr>
<tr>
<td>Pigs an A-to-Z Book</td>
<td>Anderson, Susan &amp; Buggey, JoAnne</td>
<td>9781926781006</td>
</tr>
<tr>
<td>Place to Grow Voices, A</td>
<td>Hassler, David &amp; Gregor, Lynn</td>
<td>0829812954</td>
</tr>
<tr>
<td>Polar Polka</td>
<td>Stihler, Cherie B.</td>
<td>9781570615207</td>
</tr>
<tr>
<td>Pumpkin Book, The</td>
<td>Gibbons, Gail</td>
<td>0823414655</td>
</tr>
<tr>
<td>Pumpkin Patch Scarecrows</td>
<td>Fiorello, Frank</td>
<td>0964630036</td>
</tr>
<tr>
<td>Pumpkins</td>
<td>Farmer, Jacqueline</td>
<td>157091558X</td>
</tr>
<tr>
<td>Reasons for Seasons, The</td>
<td>Gibbons, Gail</td>
<td>0823411745</td>
</tr>
<tr>
<td>Rice Is Life</td>
<td>Gelman, Rita Golden</td>
<td>0805057196</td>
</tr>
<tr>
<td>Romance and Reality of Ranching, The</td>
<td>Hadley, C. J.</td>
<td>0974456306</td>
</tr>
<tr>
<td>Schoolyard Mosaics, Designing Gardens &amp; Habitats</td>
<td>National Gardening Association</td>
<td>0915873443</td>
</tr>
<tr>
<td>Scrambled States of America, The</td>
<td>Keller, Laurie</td>
<td>0805058028</td>
</tr>
<tr>
<td>Seasons of Farm Bureau, The</td>
<td>Thornton, Mace</td>
<td>1564690180</td>
</tr>
<tr>
<td>Seed, Soil, Sun, Earth’s Recipe for Food</td>
<td>Peterson, Cris</td>
<td>978-1-59078-713-7</td>
</tr>
<tr>
<td>Shepherd's Trail, The</td>
<td>Urbigkit, Cat</td>
<td>9781590785096</td>
</tr>
<tr>
<td>Soybeans an A-to-Z Book</td>
<td>Anderson, Susan &amp; Buggey, JoAnne</td>
<td>9780981133515</td>
</tr>
<tr>
<td>Soybeans in the Story of Agriculture</td>
<td>Anderson, Susan &amp; Buggey, JoAnne</td>
<td>9780981133522</td>
</tr>
<tr>
<td>Spring Waters, Gathering Places</td>
<td>Chisholm De Yonge, Sandra</td>
<td>1888631058</td>
</tr>
<tr>
<td>BOOK</td>
<td>AUTHOR</td>
<td>ISBN</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>----------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Steel in the Field</td>
<td>Bowman, Greg</td>
<td>188862602X</td>
</tr>
<tr>
<td>Story of Calvin Cotton, The</td>
<td>Carvalho, Paula &amp; Johnson, Christine</td>
<td>0971563608</td>
</tr>
<tr>
<td>Story of Pumpkin, The</td>
<td>Fiorello, Frank</td>
<td>0964630028</td>
</tr>
<tr>
<td>Success with School Gardens</td>
<td>Guy, L. A.; Cromwell, C.; &amp; Bradley, L. K.</td>
<td>0965198707</td>
</tr>
<tr>
<td>Sugarbush Spring</td>
<td>Wilson Chall, Marsha &amp; Daly, Jim</td>
<td>0688149073</td>
</tr>
<tr>
<td>T.C. Cobb and the Cornstalk Riddles</td>
<td>Prankey, Susan M.</td>
<td></td>
</tr>
<tr>
<td>That's What Happens When It's Spring!</td>
<td>Good, Elaine W.</td>
<td>1561481459</td>
</tr>
<tr>
<td>The Yummy Alphabet Book</td>
<td>Pallotta, Jerry</td>
<td>9780881068986</td>
</tr>
<tr>
<td>These Florida Farms</td>
<td>Seamans, Gary &amp; Wright, Mike</td>
<td></td>
</tr>
<tr>
<td>Those Mean Nasty Dirty Downright Disgusting But Invisible Germs</td>
<td>Rice, Judith Anne</td>
<td>1884834310</td>
</tr>
<tr>
<td>Three Little Javelinas</td>
<td>Lowell, Susan</td>
<td>9780873586610</td>
</tr>
<tr>
<td>Til The Cows Come Home</td>
<td>Icenoggle, Jodi</td>
<td>9781590788004</td>
</tr>
<tr>
<td>Time to Go</td>
<td>Fiday, Beverly &amp; David</td>
<td>0152006087</td>
</tr>
<tr>
<td>Tree Farmer, The</td>
<td>Leavell, C. &amp; Cravotta, N.</td>
<td>1893622169</td>
</tr>
<tr>
<td>True Tale of Johnny Appleseed, The</td>
<td>Hodges, Margaret</td>
<td>0823412822</td>
</tr>
<tr>
<td>Understanding Place</td>
<td>Sinton, Diana Stuart &amp; Lund, Jennifer J.</td>
<td>1589481496</td>
</tr>
<tr>
<td>Vegetable Alphabet Book, The</td>
<td>Pallotta, Jerry</td>
<td>9780881064698</td>
</tr>
<tr>
<td>Vegetables We Eat, The</td>
<td>Gibbons, Gail</td>
<td>0823420019</td>
</tr>
<tr>
<td>View From Bald Hill, The</td>
<td>Bock, Carl E. &amp; Jane H.</td>
<td>0520221834</td>
</tr>
<tr>
<td>Visit to the Farm, A</td>
<td>Hol, Coby</td>
<td>155858000X</td>
</tr>
<tr>
<td>Way Out In the Desert</td>
<td>T.J. Marsh</td>
<td>9780873586870</td>
</tr>
<tr>
<td>What is a Plant?</td>
<td>Kalman, Bobbie</td>
<td>0865059829</td>
</tr>
<tr>
<td>When I Read</td>
<td>Fiorello, Frank</td>
<td>0964630060</td>
</tr>
<tr>
<td>When Vegetables Go Bad!</td>
<td>Gillmor, Don &amp; Gay, Marie-Louise</td>
<td>1552091929</td>
</tr>
<tr>
<td>Where Does Food Comes From?</td>
<td>Rotner, Shelley &amp; Goss, Gary</td>
<td>9780761329350</td>
</tr>
<tr>
<td>White Wonderful Winter!</td>
<td>Good, Elaine W.</td>
<td>1561481432</td>
</tr>
<tr>
<td>Wiggle-Waggle Woof!</td>
<td>Stthler, Cherie B.</td>
<td>9781570615597</td>
</tr>
</tbody>
</table>
9/27/2010

Dairying in the Desert

_Caballero sees weather as benefit, challenge of dairying in Arizona_

by Jennifer Burggraft

ELOY, Ariz. – Dairying in the desert does not sound appealing to most Midwest producers. But to Craig Caballero, the arid climate of central Arizona provides a nearly perfect dairy scenario.

“We battle the heat, but we’ve become very effective at it here in Arizona," Caballero said. “... There’s four months where it’s tough, but I don’t know a better place to dairy then Arizona because of the dry, cool weather [the rest of the year].”

Caballero is the manager and an owner/partner of Caballero Dairy Farms near Eloy, Ariz., along with his wife, Heather. They have four children: John, Anika, Joseph and Ethan.

The dairy was started by Caballero’s parents, Manuel and Dorothy Caballero, in 1958 as a 90-cow operation in Mesa, Ariz. Since then it has grown to an 8,000-head (including youngstock, dry cows and milking cows) dairy based out of Eloy, about 45 minutes southeast of Phoenix in Pinal County. Fifty people are employed between the main dairy and their heifer raising facility, which houses calves from one day to one year old.

“Pinal County is a big dairy area,” Caballero said. “There are close to 100,000 dairy cows in the county, and the infrastructure is very dairy friendly.” That’s over half the dairy population in the entire state.

“Arizona is a very small dairy state, with only 150,000 to 170,000 milk cows,” he said. “About 98 percent of the dairies are within a 100-mile radius of Phoenix.”

Today the Caballero family has a mixed milking herd of 3,600 cows, almost twice the size of the average Arizona dairy. The herd is milked three times a day in a 72-cow rotary parlor, another fact that sets them apart from other Arizona dairies.

“There are around seven rotary parlors in the state. That’s less than 10 percent,” Caballero said. Part of that stems from the fact that they are also one of the newest dairies in the state, opening at the Eloy location in June 2006.

Being in a desert climate where summer temperatures average 108 to 110°F, with lows between 80 and 85°F, the Caballeros have learned to handle the heat. The Caballeros’ herd is housed in Saudi barns – large, high-roofed, composted bedded pack loafing sheds designed from the barns used in Saudi Arabia. Fans hang every 20 feet throughout the barn.

“We have to spend millions of dollars of capital investments in cooling [our cows],” Caballero said. “We don’t deal with humidity, but we have four to five months that we have to concentrate on cooling by fans, misters and overhead soakers to keep our milk production and reproduction. Dairies here are built around cooling and cow comfort.”

But while June through September are challenging, the rest of the year provides ideal temperatures for dairying. Winter temperatures average 65°F for the high and 30°F for the low, though Caballero has seen it drop as low as 12°F in winter and get as hot as 120°F in the summer.

http://www.dairystar.com
“Ninety degrees in Arizona is more comfortable than 90°F in Minnesota,” Caballero said. “It’s very dry here, and if there is any breeze, it’s not as uncomfortable as it sounds.”

While the fact that it’s dry helps with cow comfort and cow health, it does present a problem when it comes to growing crops. The average rainfall in Arizona is approximately 7.5 inches per year, Caballero said.

“Typically we get three-fourths of that in a three-month window. There are four to five months [out of the year] when it won’t rain at all,” he said. “We’re in the desert, so water is and always will be a huge problem and challenge.”

Because of this, all cropland in Arizona is irrigated. Producers have to purchase water rights for home and farm use. In many cases, water rights for irrigation are grandfathered in when a farm is purchased, Caballero said.

“There’s a lot of cost to water here,” he said. “… We have to do things here to make water last, to make the ground more efficient.”

One of those practices is laser leveling their land – discing fields so the water is evenly distributed throughout. Excess water is caught up in drains at the end of a field and recycled for the next field.

While part of their water supply comes from the summer rains, what they depend on for irrigation and farm use comes during the winter months, in the form of snow pack in the northern part of the state, which drains into their reservoirs.

But although it snows in the mountains surrounding the desert, Caballero has only seen it snow twice in the Phoenix area, averaging once every 15 to 20 years, he said. The last snow they got was in 2006, shortly after opening in Eloy.

The Caballeros raise around 2,000 acres of alfalfa and 1,000 acres of corn silage each year. The soil is mainly fertile clay with some sand, and because they are in a valley, the landscape is flat, surrounded by mountains. “Most dairies [in Arizona] have to purchase a majority of their feed,” Caballero said. “In our case, we are able to grow around 70 percent of our forages in house, but the other 30 percent we buy. We’re able to grow more than most.”

They also buy soybeans and corn each year, most of which comes from the Midwest. “Ultimately, we’re more dependent on purchasing than growing,” he said. In recent years, this has caused their cost of production to drastically increase.

“Since ethanol took off, our cost of production has gone up inherently,” Caballero said. “It costs us $1 to $2 more, and it’s directly feed driven.” The cost of locally grown feed has also increased with the cost of water.

“So between what we are able to grow and the cost of water, it’s been a struggle to stay efficient,” he said.

What has helped is their co-op, United Dairymen of Arizona (UDA), which represents over 90 percent of the milk in Arizona.

“We have a great co-op. They’re very agile and producer-friendly, and they are able to make good decisions quickly,” said Caballero, who serves on UDA’s executive committee. Their co-op has helped the Caballeros build their farm to what it is today: a prominent modern Arizona dairy.

“We’re currently concentrating on doing what we can to become as efficient as we can,” Caballero said about future plans. “We’ll do as well as we can, and when an opportunity comes about, we’ll take advantage of it. We’ll keep on working hard every day.”

http://www.dairystar.com
Building a better pepper

By Ainslee S. Wittig/Arizona range news ---- January 27, 2010

Ed Curry found his passion in the chile fields of Southeast Arizona

Edward Curry's parents planted their first chile crop in 1957, and he grew up in those chile fields in Southeastern Arizona. "My Mom and Dad worked hard at it, and chilies kept them profitable. My Dad started us farming young," he said. "When I was just eight, my Dad was looking for a better chile and I flew with him to New Mexico to a seed farm. That made a big impression on me and I became interested in genetics at a young age."

He went to Elfrida High School and then on to one semester of college, but he really didn't enjoy learning at a desk. So, he turned to his passion for chilies, and started to build his own education. "I wanted to do more than just grow chilies; I wanted to breed chilies. It was a challenge," he said, and his desire grew into a lifelong interest in chile genetics.

Now, Curry, at 53, is internationally known for his work in chile genetics. He has just filed a utility patent on a chile that he and his partner, Phil Villa, bred. The 'Phil Villa' chile pepper, as he calls it, "has very unique properties and flavor. To file for a utility patent on a plant, you have to show extreme differences and specific value. It's a very difficult thing to do," Curry said. "I am also currently working with a group doing the Genome mapping for peppers - making descriptions of every gene in peppers. There are five scientists tied to it and the project costs about $30 billion," he said.

But let's back up a bit.

In 1986, Curry started the Curry Seed and Chile Co., now a 1,200-acre farm in the Sulphur Springs Valley near Pearce. Curry said most of his knowledge of genetics came from working with his former teacher and current partner, Phil Villa, a well-known chile breeder. Others who helped him learn were Jeff Silvertooth of the University of Arizona; Ben Villalone of Texas A&M - known as 'Dr. Pepper' for "taming" the jalapeno, and Stephanie Walker of New Mexico State University, among others. "I have spent the last 30 years trying to understand gene traits - and I still don't have near the knowledge I need," Curry said.

For many years, he has worked on developing new and improved hybrids that are now produced with uniform quality, flavor and heat. "In 1993, we were the first to stabilize heat in the commercial chile industry. Once you learn how, it's not hard to do," he said.

Then about eight years ago, Curry was asked by Mexico's Department of Agriculture to improve the yield of the Guaillo pepper. "I doubled the yield and kept the unique flavor of the Guaillo," which is a popular Mexican pepper with high oil content used for drying, he said.

In another pepper, Curry has developed a thin-skinned cross. "By making the epidermis of the chile thinner (for roasting purposes), this has made a 10-percent difference in sales in the industry and several millions of dollars per season," Curry said. "This allows people to start eating the skin, which has more nutrients."

"We have a patent pending for this new thin-skin variety," he added. Curry summed up his work: "We're playing with gene packages."

In 1995, Curry was asked to attend the Asian Vegetable Research & Development Center in Taiwan, where he was invited to swap genetic material, which PhDs use for breeding work. "I came back with the specific gene I was looking for," he said. "I was very honored to be there. This center is supported by the United Nations and there are 7,000 cultivars of pepper in the seed bank there."

http://www.willcoxrangenews.com
Curry said, "In third world countries, most of the farms are very small - often one acre - and they're trying to keep up with growing populations. The numbers of acres of farmland are shrinking and the population is growing. It is the job of the agriculturists to feed the world. Nutrition and high yield are important. That is why genetic breeding is important."

Locally, the Currys hosted their fourth Field Day in September 2009, where about 70 researchers from the Southwest (and elsewhere in the U.S.) come to his farm to study the genetics of the chili industry. The genetic origins for 80 to 90 percent of the New Mexico variety green chilies grown commercially in the U.S. can be traced back to Curry's farm in Arizona, he said, as the Curry Seed & Chile Company supplies chile seed to growers in the Southwestern U.S. and in several states in Mexico. "We're at the heart of chili research," he said.

"There's great joy in that, however I always worry about making a mistake. I could screw up and that could affect 90 percent of the industry," he said. In 1996, he partnered with Jeannie England at the Santa Cruz Chilli & Spice Co., a manufacturer and retailer of chili products. He said his father and Jeannie's father (Gene England) had worked together since Gene started the company in 1943.

His chile paste is canned at Curry's Farm in Pearce and he sends it to Santa Cruz. It ends up at several big-name companies. And, Curry's hot pepper mash ends up at Tyson Foods for hot wings. "Our farm is one of the few seed-to-shelf farms. We do the genetics, grow the crops in the fields, and then all the processing and canning right here," he said. Chile research is not only for the food industry, however.

Capsaicin is the ingredient found in different types of hot peppers that makes the peppers spicy hot. When a capsaicin cream or ointment is used on the skin, the capsaicin helps relieve pain by first stimulating and then decreasing the intensity of pain signals in the body. "The capsaicin is formed at the top of the placenta where the seed is formed and it can be used for anesthesia - it deadens the nerves. The chile industry is on the cutting edge in bio-pharmaceuticals. In the work that I am doing (generally, making genetic selections based on Scoville heat unit measurements for peppers and the five genes that make up capsaicin), I had to sign a silence agreement," Curry said.

Created in 1912, the Scoville heat unit is the closest thing to a standard for measuring the heat in a pepper. It is a measurement that involves adding sugar to a solution until one can no longer taste the pepper. The more sugar, the higher the spice, the greater measurement in Scoville units. "I'm 53 and my kids think I can eat fire! I've spent 30 years tasting chilies - it deadens the nerves over the years, so I really can't taste the heat as much. That's what we've found out for local anesthetics, as well," Curry said, adding if you walk into the area where the chile is crushed, the atomized capsaicin "is great for a sinus headache." "Over the next 30 years, there will be a lot more usage of capsaicin medicinally," he added.

Curry is a bit surprised by his status at this point. In September 2008, he was the guest speaker at the International Pepper Conference held at Rutgers University in New Jersey. "I was this farm boy talking to a bunch of doctors!" he said, obviously amazed at his own predicament.

Curry and his wife Jeanette have four children currently at home, Keiffer, Mikey, Jordan and Tyler, who is running part of the farm: "We may be Curry & Sons Farm one day," he said.

While speaking to members of several FFA chapters who visited Curry's farm in October, he said, "If I can inspire one of you to study genetics, it's worth doing this. Gene manipulation is what will hold our world together and keep us from being hungry. And I'd like to keep America in the forefront of this industry. "But, I enjoy speaking and encouraging young folks. And I tell them, whatever you do, you've got to have passion for it. Education never stops. We are searching every day for something to uncover. So, if there's one thing I can pass on, it is, love what you do.

"For me, my heart is here on my farm. I put what profit we make back into my research — it is my hobby, my passion. People go on vacation, or love fishing. For me, I don't have to go to the mountains to have fun. It's here. The farm and my research … it's my life."

http://www.willcoxrangenews.com
UN admits flaw in report on meat and climate change

The UN has admitted a report linking livestock to global warming exaggerated the impact of eating meat on climate change.

By Alastair Jamieson
Published: 7:16AM GMT 24 Mar 2010

A 2006 study, Livestock’s Long Shadow, claimed meat production was responsible for 18 per cent of greenhouse gas emissions – more than transport.

Its conclusions were heralded by campaigners urging consumers to eat less meat to save the planet. Among those calling for a reduction in global meat consumption is Sir Paul McCartney.

However, one of the authors of the report has admitted an American scientist has identified a flaw in its comparison with the impact of transport emissions.

Dr Frank Mitloehner, from the University of California at Davis (UCD), said meat and milk production generates less greenhouse gas than most environmentalists claim and that the emissions figures were calculated differently to the transport figures, resulting in an “apples-and-oranges analogy that truly confused the issue”.

The meat figure had been reached by adding all greenhouse-gas emissions associated with meat production, including fertiliser production, land clearance, methane emissions and vehicle use on farms, whereas the transport figure had only included the burning of fossil fuels.

Pierre Gerber, a policy officer with the UN's Food and Agriculture Organization, told the BBC he accepted Dr Mitloehner's criticism. "I must say honestly that he has a point – we factored in everything for meat emissions, and we didn't do the same thing with transport," he said.

"But on the rest of the report, I don't think it was really challenged."

He said a more comprehensive analysis of emissions from food production was being produced and should be available by the end of the year.

Dr Mitloehner told a meeting of the American Chemical Society in San Francisco that producing less meat and milk would only result in "more hunger in poor countries" and that efforts should be focused on “smarter farming, not less farming”.

Earlier this year, the UN's Intergovernmental Panel on Climate Change apologised after wrongly claiming the Himalayan glaciers could vanish within 25 years.
Arizona teachers become the students at Summer Agricultural Institute

BY JOYCE LOBECK, SUN STAFF WRITER
July 8, 2007 - 12:02AM

Twenty teachers from around the state recently got a crash course in agriculture in Yuma County. They were participants in this year's Summer Agricultural Institute, held annually to educate the state's educators about the scope and value of agriculture in hopes they will take that awareness back to the classroom, said Monica Pastor, a University of Arizona Cooperative Extension agent in Maricopa County and coordinator for the program.

The goal is expose K-12 teachers to the diversity of agriculture in the state, provide motivation and resources for them to incorporate it into their lesson plans and demonstrate the career possibilities for their students, Pastor said.

"Many start with no background in agriculture," she said. "But we all eat, wear clothes, have a roof over our heads. We need to keep agriculture in this country."

Hundreds of teachers have participated since the program began 17 years ago. In past years, the five-day institute has visited various areas of the state. This year was Yuma County's turn.

"We've been avoiding Yuma because of the heat," Pastor said, "but there is so much agriculture here. It is the top agriculture area for the state."

The trip proved to be eye-opening. "We had never done seed distribution," she said. "We had never seen black-eyed peas, never seen dates processed." Pastor said the group also heard about the need for more students to go into science, whether in farming or agriculture-related careers such as research and technology development.

Among the participants were two teachers from eastern Yuma County. Even they were amazed at the scope of agriculture here, and the experience has them considering the many ways they can use what they learned and the resources they were given in their classrooms.

"Even with my background, I found out new things," said Judy Newman, a longtime Roll-area resident since the eighth grade whose family has been involved in agriculture. She was particularly impressed by "all the new high tech stuff. I'm very aware of laser leveling ... and knew about GPS (Global Positioning System), but I didn't realize how much it is used in farming."

Newman also said she was familiar with produce being grown in the fields, but a tour of the Dole salad processing plant gave her a new awareness and appreciation for Yuma County's fresh vegetable
production. That's definitely an experience she wants to share with her students, many of whose parents labor in the fields, planting and harvesting the crops.

A visit to the new ethanol plant in Pinal County and presentation on the planned plant near Tacna brought the emerging industry home to Newman. "I definitely will bring some of what I learned into my classroom," said Newman, an English teacher at Antelope High School. "We were given a lot of resources. Now I have to figure out how to put them to use. I'm on the lookout for lesson and project ideas."

She's already planning a couple of field trips "to help my students become more aware of agriculture beyond the fields." She also wants to bring in people to talk about high tech in agriculture. "And it doesn't hurt to do some reading," she said. "Maybe it would be topics for research papers."

The trip also gave Newman a chance to catch up on a couple of people she had previously known. One presenter, Marcos Moore, who works for the University of Arizona, was one of her fifth-grade students. "It was nice to see him go on in the farming world," Newman said.

Each teacher spent a night with a host farming family. As it turned out, Newman's host, Mark Spencer, had been in the same 4-H club with her while they grew up in Mohawk Valley. "So we did a lot of reminiscing."

A highlight of the trip for Newman was listening to her fellow participants talk about how much the experience had changed their perception of agriculture and the people who labor to provide this nation's food. "One said she had never met so many intelligent people," Newman said. "They gained an awareness of what agriculture is about. It's not just the guy in overalls."

Sarah Rodriguez, who teaches seventh- and eighth-grade science at Wellton Elementary School, said the trip "re-energized me" and will be a big help in teaching science. "It was an eye-opening experience in how we can use our surrounding area in our teaching," she said. "Everything we observed was tied in with our curriculum and (teaching) standards. There are a lot of good ideas out there, but it's not always clear how we can tie it in. They gave us a lot of resources and even lesson plans." She also appreciates gaining a network with other teachers to share ideas.

Even though she was born and raised in Wellton, Rodriguez said she "learned so much about agriculture" and the importance of farming there to the region and nation. As a result, she not only will be able to share with her students the many opportunities in the industry, but also to help them gain "new pride in what their fathers do. Without them, we wouldn't have what we have today."

Both teachers would recommend the trip to others. "It was an inspiring week and educational," Newman said. Rodriguez expressed appreciation to her administrator for recommending her for the trip and to Wellton-Mohawk Irrigation and Drainage District for sponsoring her.

For more information, contact Monica Pastor, coordinator, at 1-602-470-8086 or mpastor@ag.arizona.edu.

Joyce Lobeck can be reached at jlobeck@yumasun.com or 539-6853.
Maricopa Agricultural Center hosts Arizona educators
Ag Institute puts teachers in field

By GLORIA SAVKO, Staff Writer                June 28, 2007

More than 20 schoolteachers and administrators from throughout Arizona recently visited Maricopa to expand their knowledge of agriculture. All were participants in the annual Summer Ag Institute, a program presented by the University of Arizona Cooperative Extension.

Monica Pastor, associate agent for the extension in Maricopa County, said the program arose 17 years ago from a desire to bring the subject of agriculture into the classroom and to be able to do so without time restrictions and staff limitations.

"I may have gotten into a classroom one time in a school year for maybe half an hour," Pastor said. "We decided if we could train the teachers that we could have them in the classroom 180 days a year, all day long, if they wanted to incorporate agriculture into their lessons."

This year's five-day institute was held June 18-22, and encompassed hands-on activities and classes not only in Maricopa, but also in Phoenix, Yuma, Wellton and Stanfield.

On Thursday, June 21, the group visited the Maricopa Agricultural Center (MAC), a 2,100-acre educational research facility on Smith-Enke Road.

Outdoor activities included using a net to "sweep" an alfalfa field for insects, placing the insects in bags and then freezing them. Later, the group identified what kind of insects they had gathered and cataloged them as either "good" or "bad" bugs.

"(Sweeping) gives them an appreciation for how many insects they found because they go out in the field and ... they don't really see much. For every insect they see, there are probably 500 to 1,000 more they don't see," said Ed Minch, task leader and an Arizona Department of Agriculture retiree.
Participants also learned how to operate irrigation siphoning tubes and listened to presentations about cotton, plant science, the Gila River Community Project and Project WET (Water Education for Teachers).

The week’s curriculum had a positive impact on the teachers. "The broad spectrum of farming and agriculture has really opened my eyes to a lot of things," said Lee Scott, a seventh- and eighth-grade teacher at Gilbert Junior High School. "We stayed with a farm family a couple of nights ago, and that was really neat because I would never have the time to just chat and get to know them. I was surprised at how much they are like me. It's been a really fun experience."

Anne Howe teaches fourth grade at Sacaton Elementary School in the Gila River Indian Community, which is home to the 16,000-acre Gila River Farms. It produces cotton, alfalfa and various food crops. "We've been asked by the tribe to work with the elementary school to get the students more interested in agriculture," she said. "I'm hoping to plant gardens and to do some kind of in-classroom agricultural activities, so that when the students get to middle school, where they have more agricultural options, they will participate in it."

Pam Petterborg, a seventh- and eighth-grade teacher at Gilbert Junior High School, said, "I'm all about food in the classroom, so I like to enhance the perspective of how food goes from the seed to the plate and all that's involved in the agricultural industry to produce it.

Mike Cox, principal of Alpine Elementary School, said he looks forward to sharing what he's learned with his staff. "It's going to help, especially with the AIMS science test coming up," he said.

Darryn Elliott, a second-grade teacher at Buckeye Elementary School, said the institute was "very beneficial."

Admission to the program is by application. The process requires a detailed account of the reasons for applying and an explanation as to what the applicant plans to do with what is learned. "We want to make sure we get good-quality teachers," Pastor said. "We accepted 22 teachers this year, and we have funding for up to 30. They pay an $85 registration fee, but it actually costs us $450 per person to present this program."

Funding is provided by the Arizona Foundation for Agricultural Literacy. Victor Jimenez, project leader for the Ag-Literacy program at MAC, said the Summer Ag Institute is one of several programs available.

"We reach all ages," he said, "from elementary school to high school through to the winter visitors and senior citizens who come from around the country."

©Casa Grande Valley Newspapers Inc. 2008
Earthbound Farm Organic: Meet Our Farmers

Arnott Duncan calls himself a “dirt nerd.” He loves being out in the field; he says it’s his strength. He’s been farming for more than 20 years now, first with his father and brothers (he’s part of the fourth generation of his family to work the land), then on his own. Even after all these years, he still loves every moment he’s out in the field.

His wife Kathleen was a city girl from San Francisco, but she planted firm, healthy roots in the Arizona soil after she met Arnott at the University of Arizona, where they both played volleyball. Their partnership has built a thriving farm and a thriving family.

Sharing a love of farming

The Duncans farm near Phoenix, Arizona. For a time, they ran very successful public programs that helped them share the farm experience with the community in an educational and entertaining way. It seemed like a natural way to combine Arnott’s farming expertise and Kathleen’s degrees in counseling psychology and special education into a family business.

“When we first opened to the public,” Kathleen explains, “the image of farming in Arizona had hit an all-time low. People thought farmers exploited the land pretty shamelessly, just spraying chemicals all over everything with crop dusters.”

Arnott recalls the surprise he’d hear in the voices of local agriculture officials who’d call to arrange inspection visits. Just come out, he’d tell them, you don’t need to have an appointment. “I’m the first one who wants to know if we’re doing something wrong,” he says. “Just tell us and we’ll change it. That’s it.”

One ending, another beginning

Unfortunately, the Duncans had to close their public programs due to security concerns from the nearby Air Force base after 9/11. The Duncans had already been growing organically on some of their land, and they’d been planning to transition more acreage to organic when they met Todd Kodet, Earthbound Farm’s senior vice president of farming.

“You learn in farming that when one door closes, another opens,” Arnott says. “The opportunity to start growing for Earthbound Farm came along at just the right time.”

“Our public programs were such a huge investment in time and energy that maybe we wouldn’t have been able to do both,” observes Kathleen. “Today we reach many more people with our produce, and we want people to have a wonderful experience eating it.”

The Duncans are currently growing many of the baby lettuces and other varieties of baby greens that go into Earthbound Farm’s organic spring mix, as well as herbs and spinach; past seasons have seen them growing organic red cabbage, romaine, and broccoli as well.
History of the Arizona Cattle Industry

The cattle industry has been a vital part of Arizona for over 300 years. In the mid-1700s 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 gramma 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 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.

These difficulties, harsh as they were, conferred certain benefits upon Arizona ranchers. First, the realization was brought home with emphasis that stock raising had become an involved procedure an adventure had become a business. Second, planned use of range and water was necessary. Having learned these lessons, the industry turned to more scientific husbandry and subsequently recouped its losses.

Today, Arizona ranchers continue to practice sound range ecology practices. Through improvements to the land such as adding watering sites and rotating pastures, the Western rangelands are in the best condition they’ve been in for more than a century. Almost three hundred and fifty years after their introduction into our state, cattle is Arizona’s highest valued cash commodity crop.
Arizona Cattle Industry
Source: 2009 Arizona Agricultural Statistics, released September 2010

- Arizona’s inventory of cattle and calves on January 1, 2010 was estimated at 930,000 head, down 90000 head from the previous year. The 2009 calf crop of 295,000 was down 5,000 head from 2008. The value of cattle and calves on January 1 was $753,300, down 24 percent from the previous year.

- Monthly all beef cattle prices varied by $12.70 per hundredweight during 2009, from a low of $58.40 in January to a high of $70.10 in April. The marketing year average price for beef cattle decreased $12.50 per hundredweight from a year ago to $62.30. The annual average steer and heifer price decreased $0.50 to $95.60 per hundredweight and the annual average calf price decreased $4.00 to $102.00 per hundredweight. The annual average price for cows increased $6.90 per hundredweight to $45.40.

- Cattle and calf marketings in Arizona increased 12 percent to 925 million pounds but the gross income from these marketings decreased 9 percent to $603 million.

- Arizona’s feedlot inventories ranged from 358,000 head on January 1 to 275,000 head on August 1.

- Arizona’s 12 livestock harvesting plants produced 362.5 million pounds of red meat during 2009, down 11 percent from 2008.

- Arizona ranks 32nd in the country in total numbers of all cattle and calves at 930,000 head. Arizona’s cattle on feed rank 10th highest in the country at 288,000.

- As of 2009, approximately 45 percent of Arizona’s total area of 72,750,000 acres is Federal and State public trust land administered by the United States Department of Interior (USDI) Bureau of Land Management, the United States Department of Agriculture (USDA) Forest Service and the Arizona State Land Department. A majority of these public lands are leased for livestock grazing.

- The average number of milk cows maintained by Arizona’s dairy operations in 2009 decreased 9,000 head from a year ago to 177,000 head. Milk production per cow during 2009 was 23,028 pounds, down 1.5 percent from last year.

- Milk production totaled 4.08 billion pounds in 2009, a decrease of 6 percent from 2008. Value of milk produced, at $493 million dollars, was down 36 percent from the 2008 value. The average return per 100 pounds of milk in 2009 was $12.10, down $5.50 from 2008.
Animal Agriculture and Responsible Antibiotic Use

By Alun M. McClure, DVM with Hard Health Management, LP

Last month, CBS News producers created a special report on the use of antibiotics in livestock production. The piece, reported by Evening News anchor Katie Couric, is not a factual representation of the scientific, safe and careful use of antibiotics in animal agriculture. My lifetime of experience in animal agriculture makes their report seem to me biased and misleading. My parents who migrated from family farms in Oregon raised us in a small Southern California community with chickens and rabbits for meat and eggs. I worked my way through high school and college on farms and fruit orchards, a 12,000 head beef feedlot, and a university-owned dairy and milk processing plant. Professionally I have worked for 36 years with dairies, feedlots, cattle and sheep ranchers in 12 states in the U.S. and in Mexico.

Without exception I have found these owners and managers to be very concerned about the ethical treatment and welfare of their animals, including the responsible use of antibiotics. They have been interested in scientific and applied research, and have worked diligently to improve every aspect of herd health and implement management programs to prevent disease and minimize the need for the use of antibiotics.

Last week I was leaning against a fence post on a third generation family dairy farm in Arizona pondering how I might respond to the CBS report since I’d gotten word they’d be airing a story on the subject. While I was reflecting, I was watching cows returning from the milking parlor playfully loping back to their pen and rapidly placing their heads side by side through the self-locking stanchions to eat. They were voraciously consuming a well-balanced total mixed ration of locally grown forages, processed grains and agricultural by-products. They had just been calmly milked by caring professional milkers using state-of-the art milking equipment. These cows walk to and from their pen twice a day on dry, padded concrete walkways to be milked. They are bedded on clean, dry and comfortable bedding in open dry lots and under shades that protect them from the elements in the winter and cool them with water spray and fans in the summer. This family has implemented many technologies to now efficiently and humanely manage thousands of milk cows better than when they started with 40 cows years ago. These cows have never been fed antibiotics, and are only treated with antibiotics when needed to cure or prevent a bacterial infection to prevent pain, suffering and death, to enable these cows to achieve their potential to feed us and a starving world with safe, wholesome, and affordable food. That is how less than 1% of the U.S. population is involved in agriculture and can provide for the other 99% and have surplus to export to developing nations.
How are antibiotics used in animal agriculture? Besides treatment of an individual sick animal, after every possible effort has been made to successfully manage genetics, housing, environment, nutrition, feeding, vaccination and other herd or flock health practices, antibiotics may be used in feed or water to treat, control or prevent disease and to promote growth and feed efficiency. This use has been proven to improve animal health and welfare (less disease and mortality), improve growth and feed conversion (reduces bad bacteria; promotes good bacteria), and improve food safety.

I welcome open dialogue and evaluation of our agricultural production practices. It can only make us better. I do ask the evaluation to be scientific and objective, and the reporting to avoid sensationalism, hyperbole, and misleading statements aimed at inflaming opinion. The CBS News report is extremely critical of the use of antibiotics in agriculture, repeating the oft-stated but unsupported assertion that there is an alarming rise in the incidence of antibiotic resistant bacteria among farm animals. I have not recognized this as a problem in 36 years of dairy practice. Surveillance data regarding bacterial isolates from cattle by the National Antimicrobial Resistance Monitoring System does not support their claim either.

Opponents of antibiotic use in food animals claim that we don’t need antibacterials to produce meat and eggs, that their use has lead to a significant increase in antibiotic resistant bacterial infections in humans, and that their use reduces the effectiveness of human medicines. In 1999, the Heidelberg Appeal Nederland Foundation, renowned for its unbiased scientific research, conducted a study on the effect of antibiotics used for growth promotion in food animals, and concluded that there was no conclusive evidence that their use contributed to human disease or compromised the efficacy of related antibiotics in human medicine.

After growth-promoting antibiotics were legislatively banned in food animals in Denmark in 1999 in an attempt to protect public health from antibiotic resistance, there has been no reduction in the incidence of antibiotic-resistant hospital isolates in humans. In some cases resistance has increased and the incidence of some types of infections in humans has also increased. Unfortunately, disease and mortality have increased among animals, producing adverse animal welfare conditions. As a result, to treat the higher incidence of disease in animals in Denmark, it has been necessary to increase the use of antibiotics for therapeutic treatment in animals. The use of antibiotics in humans has also increased. The increased health costs and labor and the reduction in growth and feed conversion in pigs have resulted in increased production costs of $5.29 per pig.

Some purport that antibacterial-free farming makes food safer. The truth is that antibiotic use in food animals makes them healthier which makes our food safer. Chickens raised without antibiotics are three times more likely to carry bacteria that can make people sick. When the EU phased out certain antibiotic uses there was no discernable improvement in food safety. Food handling and preparation has a much greater impact on food safety. In the U.S., food-borne pathogens decreased by 15 to 49% from 1996 to 2001 following the implementation of the new FSIS/HACCP (Food Safety Inspection Service/Hazard Analysis Critical Control Points) regulations. Proper food handling and cooking prevents human infection by food-borne pathogens.

Some bacteria are naturally resistant to certain antibiotics; others acquire resistance by genetic mutation over time; and some acquire resistance after exposure to an antibiotic used in human medicine or animal production. For a person to have an antibiotic treatment failure due to acquiring a foodborne bacterial disease from eating, for example, pork, the following things would have to happen:

• The antibiotic would be used in the animal;
• The animal would have to develop a resistant bacterial strain;
• The resistant strain would have to survive through food processing/handling;
• The resistant strain would have to survive through food preparation;
• The resistant strain would have to transfer to the human;
• The resistant strain would have to colonize;
• The resistant strain would have to cause a disease; and
• The antibiotic treatment would have to fail.

What is the probability of a person experiencing a treatment failure due to antibiotic use in swine? Here are some risk comparisons:

<table>
<thead>
<tr>
<th>Risk Comparison</th>
<th>Annual Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being struck by lightning</td>
<td>1 in 550,000</td>
</tr>
<tr>
<td>Dying from a bee sting</td>
<td>1 in 6 Million</td>
</tr>
<tr>
<td>Dying from a dog bite</td>
<td>1 in 18 million</td>
</tr>
<tr>
<td>Acquiring resistant campylobacter from macrolide-treated swine resulting in treatment failure</td>
<td>&lt; 1 in 53 million</td>
</tr>
<tr>
<td>Acquiring resistant <em>E. faecium</em> from macrolide-treated swine resulting in treatment failure</td>
<td>&lt; 1 in 21 million</td>
</tr>
</tbody>
</table>

It’s easy for me to say that antibiotic resistant bacteria are not a problem when I haven’t personally experienced such an infection, but that’s meaningless to a person who has. It’s like trying to console a person who has been unable to find work for six months by informing them that the national unemployment rate is only 10%. In fact, while competing in high school athletics my daughter got a nasty skin infection on her leg caused by antibiotic resistant staphylococcal bacteria (MRSA). A few months later my wife got a lip infection caused by the same type of bacteria. These infections did not come from animal agriculture nor did the antibiotic resistance. The resistance is real but many scientists believe the primary cause is misuse (over prescribing) of antibiotics in human medicine and/or failure of patients to complete the prescribed regimen.

Antibiotic use in animal agriculture is by or on the order of a licensed veterinarian using antibiotics approved by the FDA, having passed its stringent testing requirements for efficacy and safety (for animals, our food and the environment). All major industry associations have established prudent drug usage guidelines: the American Veterinary Medical Association, American Association of Bovine Practitioners, American Association of Swine Veterinarians, American Association of Avian Pathologists, National Chicken Council, National Pork Board, National Cattlemen’s Beef Association, and others. These guidelines and FDA oversight insure that antibiotic use in food animals will protect animal health and welfare leading to production of safe, affordable and abundant food, critical to our U.S. food security.

Maintaining the health of U.S. herds and flocks requires agriculture producers and their veterinarians to have all approved safe and effective technologies, including animal health products, available to us. It would be a tragedy for misconceptions, misrepresentations or non-science based political agendas to deprive us of any valuable tools for preventing animal disease without substantial evidence of a benefit to human health.

*Editor’s Note: Many of Dr. McClure’s clients are members of the United Dairymen of Arizona and the Arizona Farm Bureau.*
Corporate Environmentalism is Generating Big Green
Want to Know How Charitable Donations Really Work?

By Stefanie Smallhouse
Arizona Farm Bureau Second Vice President

Having recently concluded that time of year when the dining room table was buried in paper, we pored over receipts, notes scribbled on the checkbook, cancelled checks, deposit records, and of course our charitable donations. According to Giving USA, Americans contributed a total of $307.7 billion to charity in 2008. For those donations going to environmental organizations to save anything and everything, have you ever wondered what you get for your donated dollar?

I suggest the last time you hung up your shower towel at the Holiday Inn instead of dropping it on the floor (this is code for don’t waste precious water on providing me with another fresh towel since theoretically I was clean when I dried off anyway) resulted in a more genuine investment for the environment than the check you wrote to Big Green.

Your donation to one of the big corporate environmental groups – Sierra Club, The Nature Conservancy, or Natural Resource Defense Council to name a few – most likely went to pay for litigation or buying land, but what was the on-the-ground result for conserving anything? How did the cactus ferruginous pygmy owl benefit from your generous donation? How was your dollar used to stop erosion along Arizona’s river ways, or improve water quality along the Colorado River?

In 2008, $758 million was donated to The Nature Conservancy, $43 million to the Sierra Club, and $108 million to the Natural Resources Defense Council (NRDC). The NRDC prides itself on “defeating, blocking, and freezing” through litigation any action that it deems harmful to the earth. But I was unable to find any on-the-ground work that they are doing to actively conserve natural resources. Apparently this organization is the self-appointed legal representation for Mother Nature and that’s it.

The self-appointed realtor happens to be The Nature Conservancy (TNC). Unfortunately, Mother Nature is hard to pin down, so not only does the sales commission go to TNC, but so does all the profit. For example TNC currently has land for sale along the San Pedro River in southeast Arizona acquired as 2,156 acres of contiguous farm land and now subdivided by TNC into 5 parcels with the option of splitting further into 10. This land could have remained unfragmented and seeded with native grasses, but instead has been left to a hostile takeover by invasive woody plants that use significantly more water than farm land.

Other large expanses of land have either been donated to the organization to take advantage of tax
credits or sold to TNC for less than appraised value and then in turn flipped to the federal government for more than appraised value. This organization is in the business of nationalizing private land for a profit, while shrinking the tax base for our schools and community infrastructures.

Purchasing agricultural land, beautiful landscapes, and waterways facing no eminent threat of destruction should not exactly qualify for saving anything. To other environmental groups this is considered to be focusing on “sub-national targets.” These targets generate revenue directly for the non-profit and would be very valuable on a carbon offset market. This is the same carbon market that would be created following passage of a cap and trade taxation system fiercely lobbied for by these same groups.

This type of focus results in what is called “leakage” in environmental language. A specific action stopped in one area only shifts or leaks the same action into other areas, but is in no way diminished. It does not result in any on the ground conservation work. I know of a few old mine reclamation sites that could sure use some of Nature Conservancy’s $758 million annual revenue for re-seeding and erosion control. Of course those pieces of land are neither profitable for flipping nor for carbon credits.

It’s no wonder that the spectrum of environmental groups ranging from land baron organizations like TNC to small potato radical organizations like the Center for Biological Diversity (CBD) are eating their own. CBD is trying to change policy on a national level to send us back to the 17th century, while TNC is subdividing farm land, and the Sierra Club in return for corporate cash is providing its stamp of approval on cleaning products sold as “green” chemicals to flush down your toilet. Where are your conservation dollars in all of this? Despite their differences, all of them are successfully using your donations for systematically dismantling roads, dams, logging, mining, ranching, farming, fishing, and manufacturing throughout the United States – forcing industry to move across international boundaries and oceans unregulated; All the while increasing the costs of agriculture production by those few left in this country.

Remember that shrinking tax base I mentioned before? Maybe your donation would be better spent going toward your local education tax credit to make up for the loss in property tax base to the school.

Editor’s Note: Stefanie Smallhouse is married to a fifth-generation farmer and rancher in Southern Arizona. She previously worked for a federal land management agency as a wildlife biologist, and is currently working to further conservation of Arizona’s natural resources through the locally led efforts of Arizona landowners.
* * * Journaling * * *
* * * Journaling * * *
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 2012 SAI Planning Committee for all their efforts to organize and coordinate the entire week of activities.

Brandon Moak - Committee Chair
University of Arizona Cooperative Extension, Maricopa County

Committee Members

Brett Cameron  Arizona Department of Agriculture
Colleen Bergum  Dairy Council of Arizona
Dennis Fiscus  Arizona Department of Education
Farm Family Hosts  Local Farmers and Ranchers
Jeannette Fish  Maricopa County Farm Bureau
Jennifer Weber  Arizona Department of Agriculture
Jimmy Wojcik  Arizona Agribusiness & Equine Centers
Marge Martin  Arizona State Cowbelles, Inc.
Monica Pastor  U of A Cooperative Extension, Maricopa County
Peggy Jo Goodfellow  Arizona Farm Bureau
Terri Verason  Dairy Council of Arizona
Tiffany Hayes  Arizona Beef Council
Tyler Grandil  Arizona Department of Education
Victor Jimenez  U of A Maricopa Agricultural Center

HAVE A GREAT SUMMER!