USDA and Cotton in Kern County

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SHAFTER COTTON RESEARCH STATION


CALIFORNIA REGISTERED HISTORICAL LANDMARK NO. 1022

PLAQUE PLACED BY THE STATE DEPARTMENT OF PARKS AND RECREATION IN COOPERATION WITH THE CALIFORNIA COTTON GROWERS ASSOCIATION, SEPTEMBER 22, 1997
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California Cotton Printed History
C.S. Capp Collection, 1872
Topics to Cover

• World and US history
• California history
• Kern county history
• Formation of the Cotton Research Station
• Station campus in the 1920’s
• Impact of station on cotton
• Station life
World

• Cotton came from the East (?)
• Europe: “a treasure from the Orient”
• England: cotton changed history
  – Cotton promoted colonization
  – Cotton challenged Wool
• US: cotton molded the South
  – Gin elevated cotton to world market
Cotton

Old Southern Definition

• “Cotton is the overcoat of a seed that is planted and grown in the southern states to keep the producer broke and the buyer crazy ...”

• The fiber varies in color and weight and the man who can guess the nearest the length of the fiber is called a cotton man by the public, a fool by the farmer and a poor business man by his creditors ...”
Cotton in California

- Cotton is not a tradition
- Influence of California Missions
- Influence of Civil War
- Influence of California Legislature
California Legislation Prizes
State Agricultural Committee Fair

- 1856 - $75 prize for best acre
- 1858 - $25 for best ¼ acre
- 1859 - $50 for best acre
- 1863 - Prize system totaling $15,000
- 1865 - $3000 for 1st 100 acres
- 1870 – Last prize
Kern County Cotton

- 1862 – First Record of cotton grown
- 1863 – Kern Island growers
- 1865 – Kern Island Courier reports
- 1865 – First gin
- 1865 – Prize award controversy
Cotton Research in California

• Why was it needed?
  – Cotton industry languishing in California
  – Market for quality cotton established
  – Markets on the east coast
  – Another war!
Cotton Research in California

• A new Concept
  – One Variety District
• Aid for marketing
• Concentrate research efforts
• “Jump start” an industry
Bill Camp Initiates Program

- Arrived with 32 cotton varieties
- 1917: First field tests
  - Cedar and 24th, Bakersfield
- Experimental Plantings
  - from Imperial to Sacramento Valleys
  - Success with big-bolled cottons
  - Prompted idea of a Research Station
Origins of “Acala”

- **Ocosingo, Chiapas, Mexico**
  - Single plant with large bolls and quality lint
- **Acala, Chiapas, Mexico**
  - Small field similar to Ocosingo plant
  - Selections made in Texas and Oklahoma
  - Shafter seed from USDA, Clarksville, Texas
- **Acala 8**
CHECK YOUR INSURANCE BEFORE ENTERING MEXICO

U.S. automobile insurance is not valid in Mexico. Arrange for full coverage, including property damage and public liability, with a reliable Mexican insurance company having complete adjusting facilities in cities throughout Mexico. AAA offices in border states can provide Mexican automobile insurance to members. ACSC and CSAA offices will issue insurance documents for rented vehicles provided that the rental car is driven only in Baja California, the 16-mile border zone along the Mexican mainland or the Mex. It "tourist route" from Lakeville, Ariz. to Puerto Peñasco, Son.

Acala, Mexico
Native Mexican Tree Cotton
Early Years of Acala, 1906-19

1919
San Joaquin Valley, California

1918

1917

1916

1915

1914
Clarksville, Texas
Selection #1
Waco, Texas

1911-13

1907-10
San Antonio, Texas

1906
Acala, Mexico

Original Seed

Selection #8

#5

#3 Oklahoma

#2

#6

Clarksville, Texas
Pima Cotton, late 1920’s
Fred Herbert, Breeder
The Station Sited

- W.B. Camp chose the area for the site
- 40 acres from Kern County Land Company
  - Nov 9 1921; Agreement Authorized
  - Nov 30 1921; Agreement signed by USDA
  - Perpetual lease for $1 per year
  - Open prairie or pasture?
The Station Develops

• 1922 to 1926 Kern County Allocated $7,500
  – Office, employee dwelling, implement shelters
• 300 foot length fields delineated
  – Labeled A, B, C, & D
• 40 foot wide plots established = 1/4th acre
• Gravity flow concrete irrigation system
  – Valve number used to specify field location
Adobe Office
Kern County Experimental Farm
Reservoir in the 1960’s
Entry and Office Before 1952
Employee Housing 1923
Bunkhouse and Guesthouse 1923
Additional Land

• Kern County Land Company
  – 1925: Sells two 10-acre adjacent field to Kern Co.
    • Origin of fields E and F
  – 1926: Transfers title to original 40 acres
  – Total Cost $12,000 for the total 80 acres
  – USDA continues lease for $1 per year
• The So.-40 purchased 1951 by Kern County
  – Included in $1 lease
ARS Station & Research Leaders

- W. B. Camp  
  - 1922 - 1934
- George Harrison  
  - 1934 - 1952
- John Turner  
  - 1952 - 1967
- H. B. Cooper  
  - 1967 - 1976
- Lyle Carter  
  - 1976 - 1988
- Lloyd Elliott  
  - 1988 - 1990
- Claude Phene (interim)  
  - 1990 - 1992
- John McLaughlin  
- Lyle Carter (interim)  
  - 1998 - 2000
- Michael McGuire  
  - 2000 -
W.B. Camp
1st Station Director
Acala P18
California Acala Series
The Beginning: 1922 to 1925

- W. B. Camp, first director
  - Continues work started in 1917
- Station becomes center of cotton research
  - Named “US Experimental Farm”
- Agronomy and breeding/selecting
  - Acala 8, Durango and many others
- Acreage increased from 50,000 to 129,000
- Value increased from $2.8 to $10.3 million
1925: Crucial Decisions
Legislative One Variety Law

• “An act to provide for the growing of one variety or species of cotton, to wit: Acala in certain prescribed and defined districts in the State of California: to prohibit the picking of any variety or species other than known as Acala in such districts, prohibits possession within such districts of cottons other than that known as Acala … penalty for violation of this act.”

   April 30, 1925
The One Variety Idea

- Old idea to encourage quality and profit
  - Uniform product from an area
  - Basis of a reputation
  - Simplified marketing
  - Remove stigma of “foreign” or mixed quality

- Promoted by Dr. O. F. Cook, USDA

- Supported by U.C. Professors
Breeding for One Variety Law

- USDA exclusively responsible for breeding
  - Defined “Acala”
- University of California cooperator
  - Agronomy and Entomology
- Farm Bureau responsible for increasing seed
  - Formed the F.B. Planting Cottonseed Distributors
- Seed release decisions: USDA and UC
1926: First Reorganization

- California Planting Cottonseed Distributors
  - Management of seed a burden for Farm Bureau
  - A cooperative of all California cotton growers
  - Responsible for increase of parent seed
  - Responsible for distribution of seed
  - Responsible for maintenance of quality
  - Provides support for breeding and station
Cotton’s Critical Age
1930’s and 1940’s

• George Harrison assigned as Director
• Verticillium tolerant strains
• Insect problems and control strategies
• Geneticist, Entomologist and Pathologist
• Major Accomplishment – Acala 4-42
  – Planted to one-variety district 1949
  – Established California’s claim to high quality
• Station renamed: US Cotton Field Station
John Turner and Bill Camp
Acala 4-42
John Turner
3rd Station Director

Acala SJ series
1952: Beginning of Golden Age

- John Turner becomes leader
  - Originator of Acala SJ series of cottons
    - Introduced new germ plasm
    - Increased verticillium tolerance
    - All current cottons derived from this stock
  - Releases SJ-1 and completes SJ-2
- USDA and University add disciplines
  - “Seed and information to grow the seed”
- New offices and laboratories
Golden Age
Resident Projects with Leader and Staff

- USDA, ARS
  - Variety Breeding
  - Genetics
  - Variety Improvement
  - Special Traits Breeding
  - Engineering
  - Nematology
  - Weed Science
  - Weed Physiology
  - Forage Crops
  - Small Seed Crops
  - Physiology *Plant Growth*
  - Physiology *Aflatoxin*
  - Pathology
  - Castor bean Harvesting

- University of California
  - Irrigation
  - Entomology
  - Fertility
  - Extension
  - Sweet Potato breeding
  - Vegetable Crops

- CPCSD
  - Variety Management
H.B. Cooper
1st Research Leader
Released SJ-2, 3, 4, & 5
1967: Shift in Leadership

- **H.B. Cooper**: breeder and leader
  - “Director” position redefined as two positions
    - “Research Leader”
      - responsible for all ARS research
    - “Location Leader”
      - responsible for station administration
      - Releases SJ-2 and SJ-5
- **Name Change**: “US Cotton Research Station”
1976: Leadership Changes Again

- Role of breeder shifts from leader to project
- Lyle Carter becomes Research Leader
  - ARS program renamed “Cotton Systems”
    - Emphasis on agronomic systems for cotton
  - Initiates the Zone Production System Research
1978: USDA Program Change

- Mission of ARS at Shafter changes
  - ARS no longer responsible for the one variety system
    - US Dept of Justice rules: “system may be a monopoly”
    - ARS program concentrates on Cotton Production
    - Breeding research limited to special traits development
    - All cotton germ plasm made available to industry

- CPSCD becomes a private breeding organization
  - ARS breeder joins CPCSD as director of research
Last Day as USDA Station
1996: The Station Changes

• Management shifts to Univ. of Calif.
• Land and facilities deeded to Kern County
  – Regardless of source of original funds
• New cooperative agreement
  – ARS will remain at the Shafter site
  – UC will manage land and facilities
  – Kern County provides use of land and facilities
• New Name:
  – Shafter Research and Extension Center
Station Impact on Cotton: I

- Cotton varieties
  - High quality with consistent premiums
    - SJ-2 and progeny
  - World renown and demand for seed and lint
  - Gossypol free seed and plant
  - Verticillium resistance/tolerance
  - Basic genetics
    - Brown lint problem to niche market
  - High yields
Station Impact on Cotton: II

- Cotton production practices
  - Basic nitrogen fertilization relationships
  - Practices for increased water penetration
  - Irrigation frequency studies
  - Crop rotation studies
  - Feasibility of “broadcast” planted systems
  - Methodology to assess seed quality
Station Impact on Cotton: III

• Knowledge for efficient production
  – Remote sensing of cotton environment
  – Models for plant and production
  – Expert system for diagnosis
  – Multidiscipline integration
  – Precision farming
  – Conservation tillage systems
Station Impact on Cotton: IV

• Efficient and high quality harvest
  – Harvester development
  – Defoliation
  – Irrigation/Fertility management
  – Growth regulators
  – Physiology of abscission
  – Progress to eliminate sticky cotton
  – Methodology for minimization of contaminants
  – Vertical studies: field – gin – spin – weave
Station Impact of Cotton: V

- Pest Management
  - Cultural and chemical nematode control
  - Pre-emergence weed control in arid culture
  - Perennial weed control systems
  - Physiology of nutsedge
  - Lygus pheromone search
  - Bio-control of spider mite
  - Fusarium/nematode syndrome
  - Aflatoxin in cotton seed
Station Impact on Cotton: V

- Pest management (continued)
  - Cultural control of verticillium wilt
  - Remote sensing of pest populations
  - Methods for distributing bio control agents
  - Seedling disease complex
  - Integrated pest management
  - Integrated weed management
  - Pink bollworm cultural control
Station Impact on Cotton: VI

• Agronomic systems
  – Precision tillage
  – Controlled traffic systems
  – Zone system concept
  – Narrow row culture
  – Alternate stalk management systems

• Automation
  – Feedback control
  – Serial bus
Station Life 1920’s-1940’s

• Work
  – Selfing
  – Rogueing
  – Ginning
  – Harvesting
  – Fiber lab
  – Animal power

• People
  – Mess club
  – Homes
  – Sports
  – Gardens
  – Guest house
  – Family