USDA-NIFA SACC project Oklahoma/Texas

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Participants

Oklahoma State

- Brian Arnall- Crop Management
- Misha Manuchehri- Pest Management
- Tom Royer- Pest Management
- Kris Giles- Pest Management
- Kristen Baum- Pest Management
- John Damicone- Pest Management
- Carol Jones- Crop Management

Texas A&M AgriLife Resrach and Extension

- Paul DeLaune- Crop and Pest management
- Clark Neely- Crop Management
- Jourdan Bell- Crop and pest management
- Emi Kirmara- Crop management

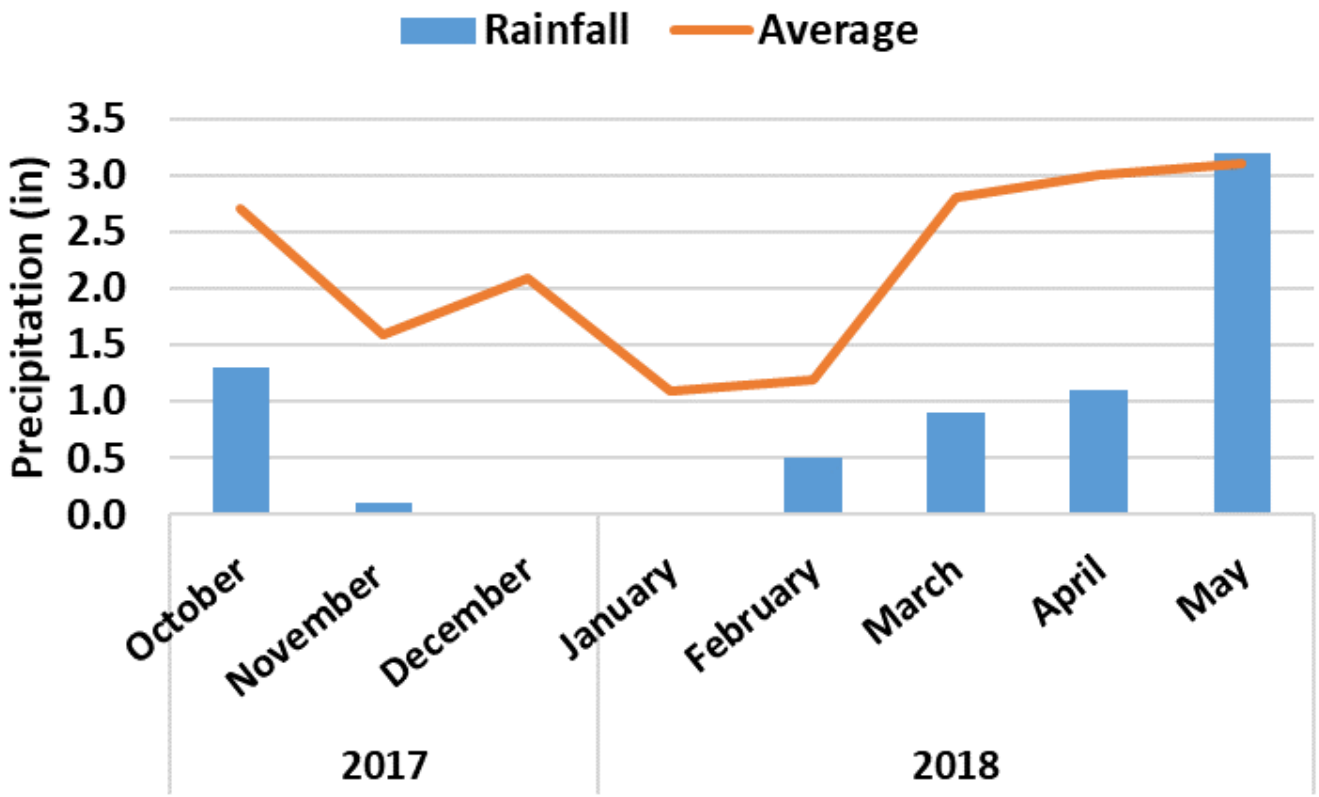
2017-2018

What did the season bring us?

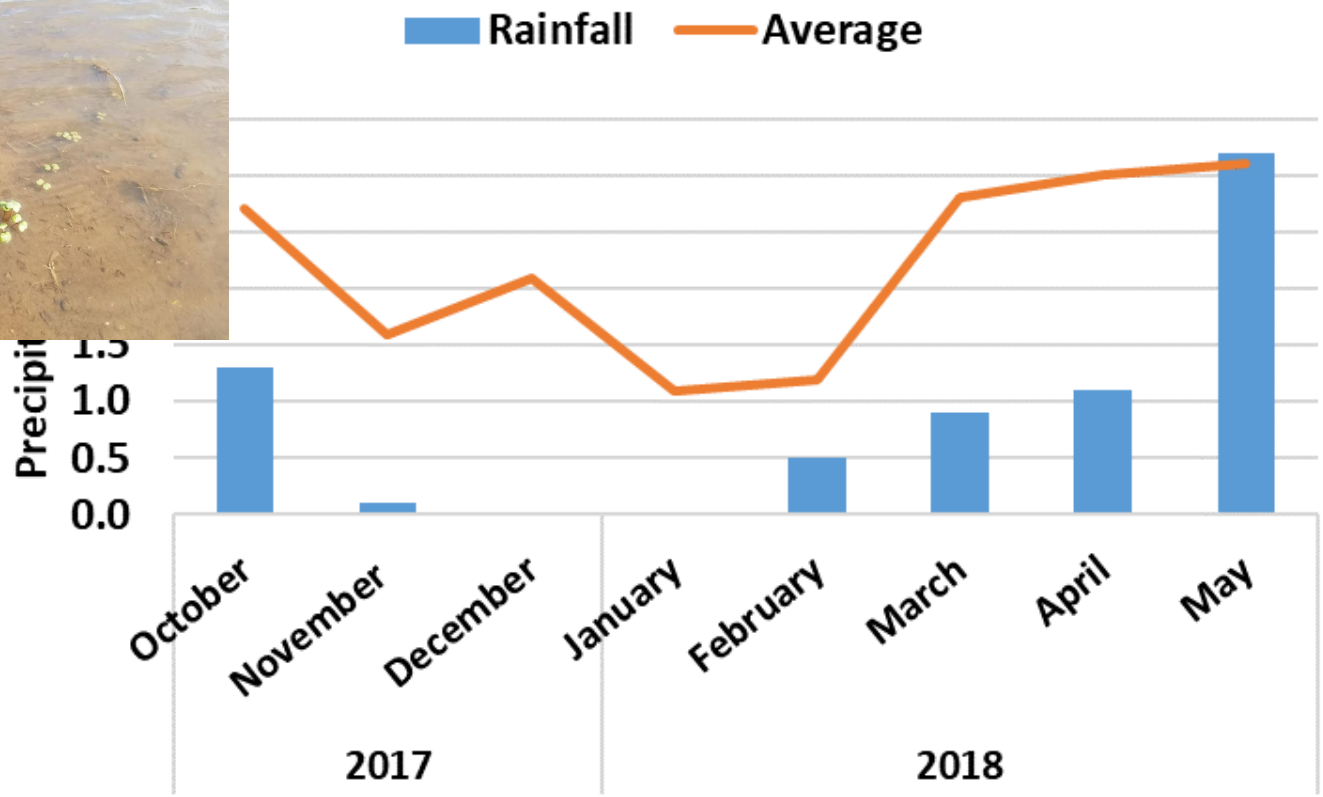
Understanding the season

- Allow us to see why we may have had the responses we had
- Highlights the need within the region

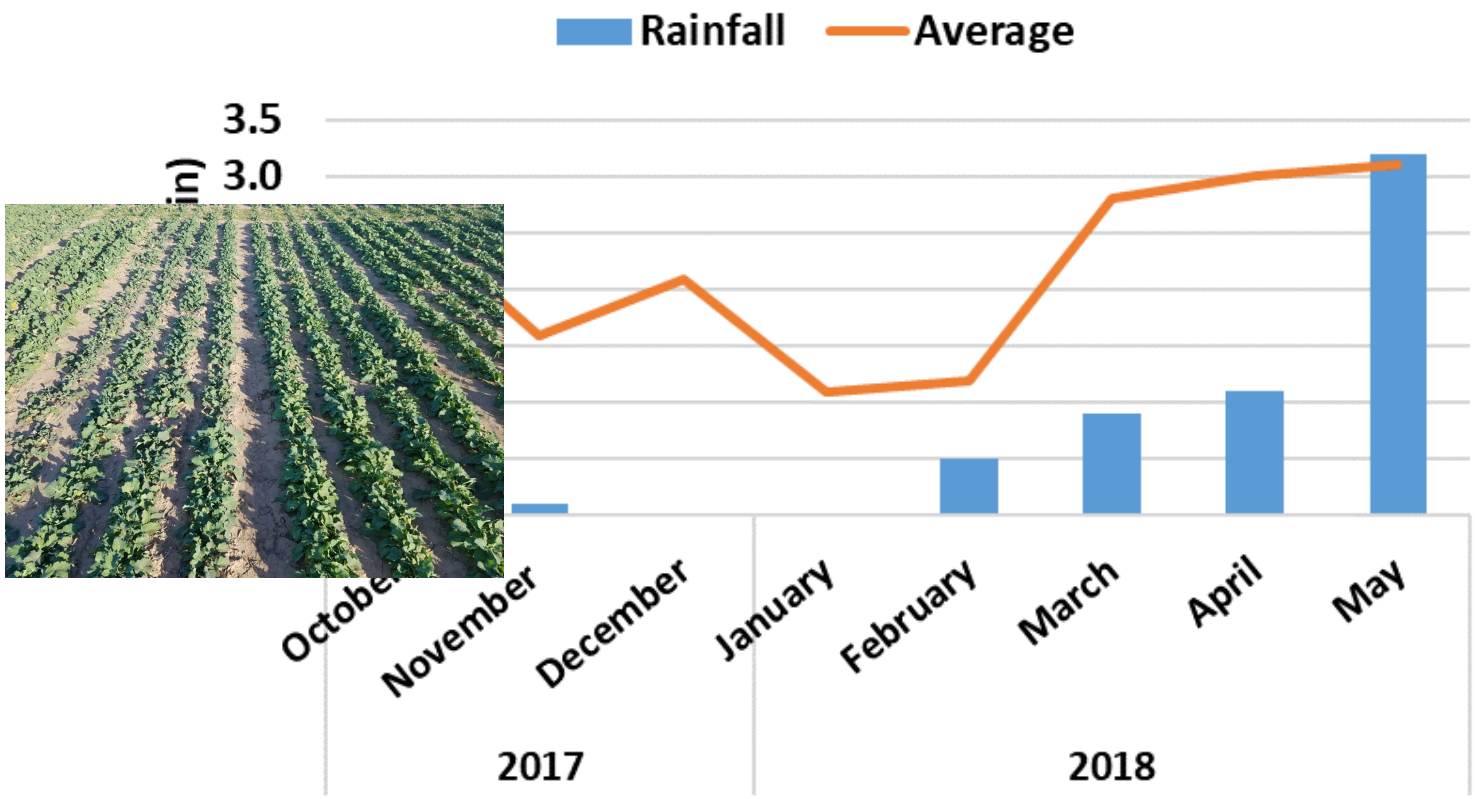
2017-2018 season



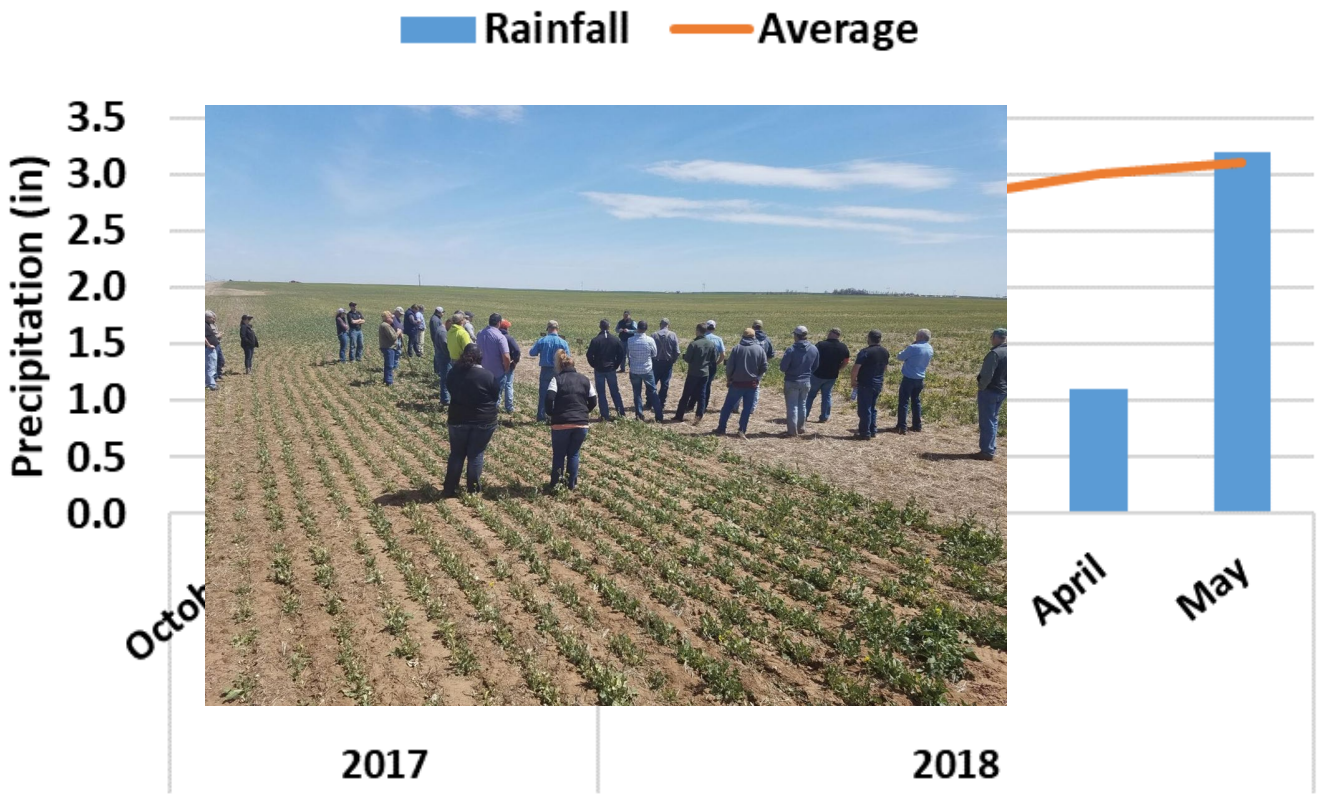
2017-2018 season



2017-2018 season



2017-2018 season



What did that lead to?

Crop failure

- Even harvested yields were lower
- Even areas that we typically have good yields and treatment responses showed little

In other areas

- Showed the true value of canola in the region

We have to find practices

- Allow for growers to optimize yields in favorable environments
- Maintain yields in unfavorable

Project goals

System-based approach to managing winter canola systems within the southern Great Plains

- Improve crop management practices for winter canola to increase both planted and harvested acres
  - Crop management
  - Planted and harvested acres
- Improve integrated pest management systems to optimize net returns and conservation pollinator habitat
  - Pest and Pollinators
- Improve knowledge of optimum practices through various extension events throughout the year.

Program Projects

Crop management

- Cultivar selection
- Tillage management
- Planting practices
- N, K, and S fertilization
- PGR management
- Input system evaluations
- Crop rotation benefits

IPM management

- Management calendar
- Chemical comparison
- Genetics of blackleg in canola
- Honeybee hive health
- Native pollinator management

Program Projects

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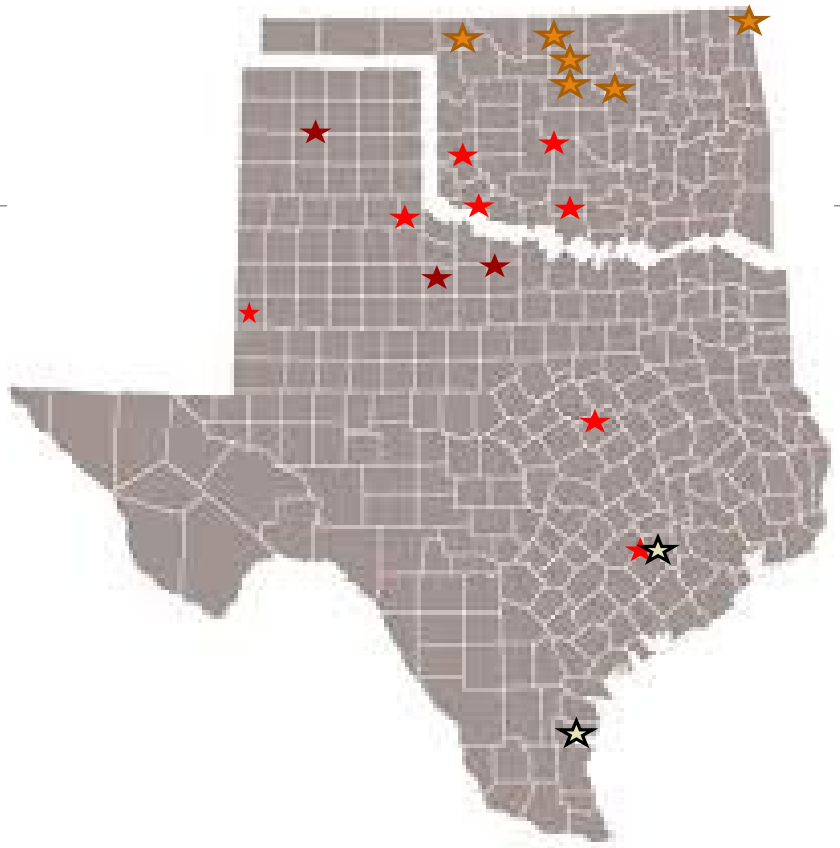
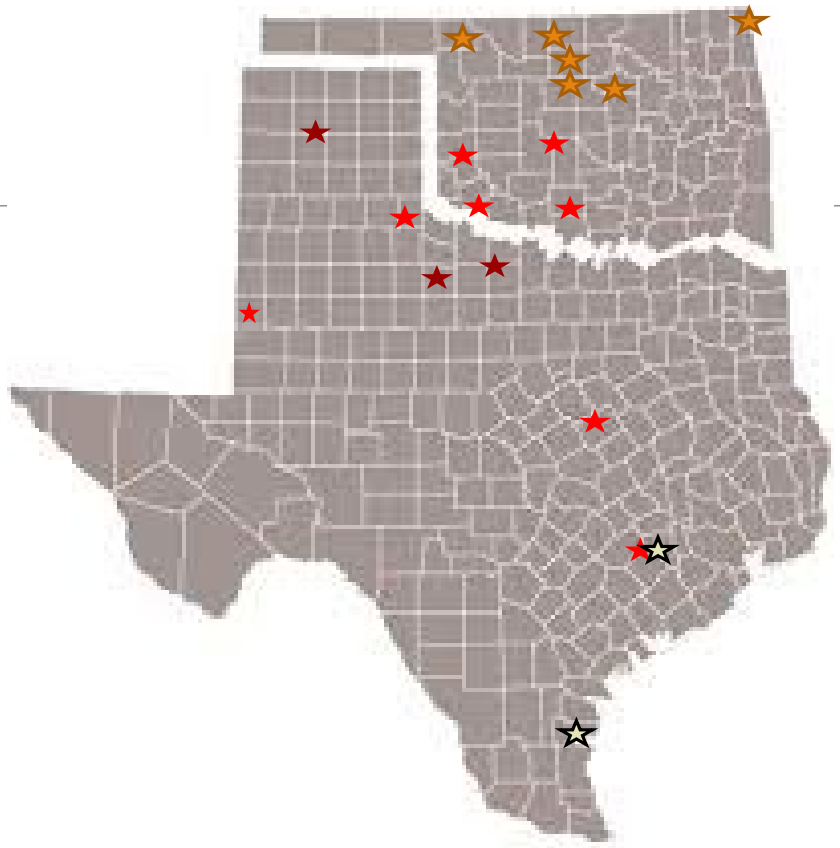
Crop management

Cultivar selection

- This project does not have a breeding component
  - Work closely with K-State and private industry
  - Evaluate the suitable of commercial cultivars for the region
- Wide range of environments
  - Areas where winter kill is limiting to where winters are not cold enough to consistently grow winter canola
  - Arid regions through the coastal bend of SE Texas
  - Many of the cultivars available are similar
    - Have to find where each cultivar fits



We got data in NW Texas



2018 Spring Canola Variety Trial: College Station, TX

Rank[†]	Cultivar	Source	Yield (lb/a) 4-Year	3-Year	2-Year	2018	Yield (bu/a)	Test Wt (lb/bu)	Oil (%)	Protein (%)	Height (inch)	Green (%)	Bloom[‡] (%)	Maturity[‡] (Date)
1	InVigor 252	Bayer	1300	1338	1133	1149	22.7	50.6	44.6	20.4	43.3	20.0	0	28-Apr
2	InVigor 140P	Bayer	1239	1291	1162	1237	25.6	48.3	44.3	22.0	45.9	36.7	0	30-Apr
3	HyCLASS 930	Croplan	784	830	750	791	16.1	49.2	49.9	20.8	41.3	20.0	93	23-Apr
4	HyCLASS 955	Croplan	758	820	644	820	16.5	49.8	47.2	20.5	41.3	10.0	93	23-Apr
5	HyCLASS 970	Croplan		1288	1171	1356	26.9	50.5	45.8	21.1	44.0	30.0	8	29-Apr
6	InVigor 233P	Bayer			1116	1240	25.2	49.3	44.6	21.1	44.6	30.0	1	29-Apr
7	InVigor 230	Bayer			1090	1293	25.7	50.3	44.2	21.5	46.6	13.3	5	28-Apr
8	InVigor 255P	Bayer				1366	27.6	49.5	46.9	20.5	46.6	36.7	0	30-Apr
9	CC SP 7*	Caldbeck Consulting				1349	26.8	50.3	43.4	20.3	43.3	23.3	0	29-Apr
10	CC SP 15*	Caldbeck Consulting				1220	25.0	48.9	46.7	21.6	48.6	33.3	0	30-Apr
11	CC SP 3*	Caldbeck Consulting				1144	23.4	48.9	42.0	21.3	--	--	87	19-Apr
12	CC SP 6*	Caldbeck Consulting				1114	22.7	49.0	47.2	20.8	49.9	46.7	0	1-May
13	CC SP A*	Caldbeck Consulting				1076	22.6	47.5	46.8	20.5	48.6	43.3	0	30-Apr
14	DKL 70-10	Dekalb/Bayer				1031	21.1	48.8	46.7	20.7	44.3	10.0	63	25-Apr
15	CC SP 16*	Caldbeck Consulting				957	20.8	46.0	45.3	22.1	46.6	26.7	5	29-Apr
16	DKL 35-23	Dekalb/Bayer				949	18.9	50.2	46.6	21.5	43.3	12.5	92	25-Apr
17	DKL 71-14BL	Dekalb/Bayer				909	18.2	50.0	46.2	20.6	47.2	25.0	70	23-Apr
18	CC SP 1*	Caldbeck Consulting				881	18.3	48.2	43.6	21.5	--	--	85	19-Apr
19	CC SP 2*	Caldbeck Consulting				837	16.4	51.1	40.1	20.6	40.7	13.3	35	27-Apr
20	CC SP 4*	Caldbeck Consulting				830	16.3	50.9	40.3	21.4	42.7	10.0	5	27-Apr
21	Empire**	University of Idaho				793	15.7	50.6	42.5	21.6	36.1	13.3	13	27-Apr
22	CC SP 5*	Caldbeck Consulting				775	15.2	50.8	40.1	22.4	38.1	8.3	5	27-Apr
	LSD		**177**	**217**	**175**	**248**	**4.7**	**0.8**	**1.5**	**0.9**	**4.9**	**10.7**	**23**	**3.0**
	CV		**19.4**	**19.8**	**14.4**	**14.3**	**13.9**	**1.0**	**1.9**	**2.6**	**5.7**	**22.9**	**45.5**	**180.0**
	Mean		**1015**	**1109**	**1006**	**1051**	**21.2**	**49.5**	**44.9**	**21.1**	**44.3**	**24.1**	**30**	**27-Apr**

*Experimental breeding line.

[†]Cultivars ranked according to 4-year, 3-year, 2-year, then 2018 yield averages.

[§]4-year average based on 2015, 2016, 2017, and 2018 data.

[‡]Bloom notes taken on February 19, 2018 and maturity notes taken April 26.

**Open pollinated cultivar

Crop management

Cultivar selection

No-till production

Rotational benefits

- For years we have been focusing on the yield benefits between wheat and canola
  - We have seen a drastic decrease in wheat acres
  - Increase has been in summer row-crops
  - In the southern US, we have little knowledge of the rotational benefits of winter canola
- Double-crop
  - Highest value, potentially profitable system

What we evaluated

Completed a season of canola and wheat

- Planted following harvest
- Wheat harvested nearly 2 weeks following canola
  - Had a delayed canola treatment
- Treated as double-crop
  - Managed- fertilized
  - Non-managed- planted and left

Summer cash crop	Previous crop	Yield	Seedling Vigor	Emergence
		lbs/ac	1-10	%
Non-managed grain sorghum	Wheat	2854	5	60
	Canola	3309	8	70
	Delayed canola	2605	4	60
Managed grain sorghum	Wheat	4206	7	65
	Canola	4127	9	70
	Delayed canola	3634	7	60
Non-managed corn	Wheat	2504	5	60
	Canola	2760	6	70
	Delayed canola	2231	5	60
Managed corn	Wheat	3147	7	70
	Canola	3567	9	75
	Delayed canola	2397	6	55
Soybean	Wheat	2046	7	65
	Canola	1572	7	65
	Delayed canola	984	5	40
Sesame	Wheat	626	3	60
	Canola	856	8	85
	Delayed canola	774	5	50

Pest management/Pollinator health

Pest management

- Insect pests
  - Continue to be one of the largest yield limiting factors
- Weeds
- Diseases
  - Maybe the least impactful

Pollinator health

- Improving honey bee health
- Promotion/protect of native pollinator temporary habitat

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2017 Hive weight increases

Field	Location	Stand Description	Daily Hive Weight Gain (lbs ± SE)
1	NW Nash, OK	Full, Heavy Prolonged Flowering	0.5925 ± 0.0761
2	NE Nash, OK	Full, Heavy Prolonged Flowering	0.5925 ± 0.1016
3	N Drummond, OK	2/3, Sporadic growth and Flowering	0.3409 ± 0.1195

2018 Hive weight increases

Field	Location	Stand Description	Hive Weight Gain (lbs±SE)
1	East Nash, OK	Modeate canola stands, Full Flower	0.46±0.21
2	West Nash, OK	Full canola stands, Full Flower	2.49±0.27
3	North Breckingridge, OK	Native pasture	0.21±0.17

Pollinator findings

Pollinators greatly benefits from canola production

- This is a commonly accepted
- The benefits have resulted greater hive weights than expected
  - Especially when compared to native pasture
  - The benefits during droughty conditions are ever apparent

Native pollinators

- Pyrethroid applications

Output/Outcome

Highly variable data provided from this program

- Extensive amount of topics covered

Data is only as good as its ability to be disseminated

Where is the data going?

- Producers
- Crop advisors

- Industry
- Students
- Other researchers

Data output

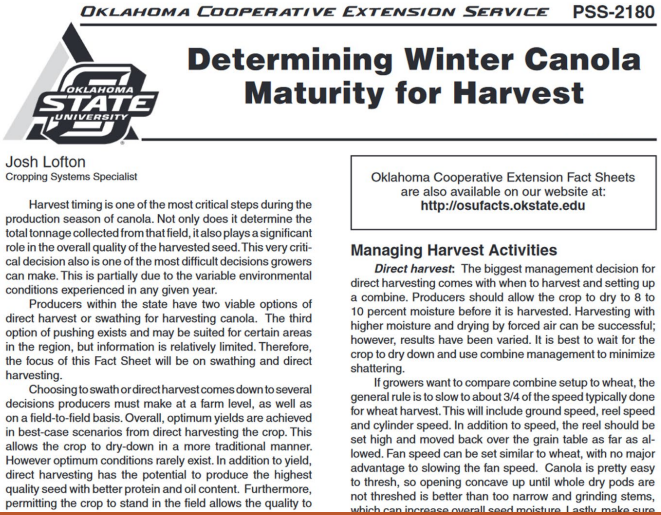
Where is the data available

- Immediate flow through of data
  - Main focused on a change of knowledge
  - Can move toward a change of practice
- Presentations
  - Nearly 700 presentations given to attendees

Data output

Where is the data available

- Long-term, stable data
  - This does not mean that we cannot get an immediate action from these sources
  - Meant to be a source to educate and point growers to beyond the life of the project



OKLAHOMA COOPERATIVE EXTENSION SERVICE PSS-2180

Determining Winter Canola Maturity for Harvest

Josh Lofton
Cropping Systems Specialist

Harvest timing is one of the most critical steps during the production season of canola. Not only does it determine the total tonnage collected from that field, it also plays a significant role in the overall quality of the harvested seed. This very critical decision also is one of the most difficult decisions growers can make. This is partially due to the variable environmental conditions experienced in any given year.

Producers within the state have two viable options of direct harvest or swathing for harvesting canola. The third option of pushing exists and may be suited for certain areas in the region, but information is relatively limited. Therefore, the focus of this Fact Sheet will be on swathing and direct harvesting.

Choosing to swath or direct harvest comes down to several decisions producers must make at a farm level, as well as on a field-to-field basis. Overall, optimum yields are achieved in best-case scenarios from direct harvesting the crop. This allows the crop to dry-down in a more traditional manner. However optimum conditions rarely exist. In addition to yield, direct harvesting has the potential to produce the highest quality seed with better protein and oil content. Furthermore, permitting the crop to stand in the field allows the quality to

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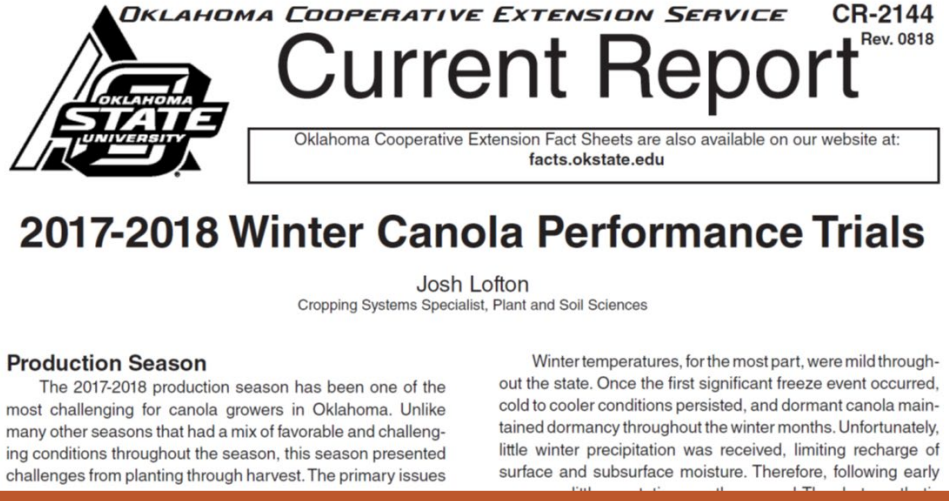
http://osufacts.okstate.edu

Managing Harvest Activities

Direct harvest: The biggest management decision for direct harvesting comes with when to harvest and setting up a combine. Producers should allow the crop to dry to 8 to 10 percent moisture before it is harvested. Harvesting with higher moisture and drying by forced air can be successful; however, results have been varied. It is best to wait for the crop to dry down and use combine management to minimize shattering.

If growers want to compare combine setup to wheat, the general rule is to slow to about 3/4 of the speed typically done for wheat harvest. This will include ground speed, reel speed and cylinder speed. In addition to speed, the reel should be set high and moved back over the grain table as far as allowed. Fan speed can be set similar to wheat, with no major advantage to slowing the fan speed. Canola is pretty easy to thresh, so opening concave up until whole dry pods are not threshed is better than too narrow and grinding stems, which can increase overall seed moisture. Lastly, make sure



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Current Report

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:
facts.okstate.edu

2017-2018 Winter Canola Performance Trials

Josh Lofton
Cropping Systems Specialist, Plant and Soil Sciences

Production Season

The 2017-2018 production season has been one of the most challenging for canola growers in Oklahoma. Unlike many other seasons that had a mix of favorable and challenging conditions throughout the season, this season presented challenges from planting through harvest. The primary issues

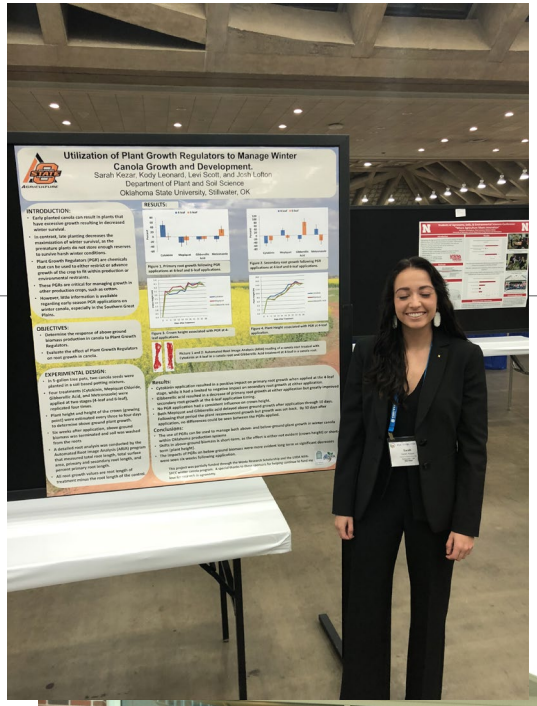
Winter temperatures, for the most part, were mild throughout the state. Once the first significant freeze event occurred, cold to cooler conditions persisted, and dormant canola maintained dormancy throughout the winter months. Unfortunately, little winter precipitation was received, limiting recharge of surface and subsurface moisture. Therefore, following early

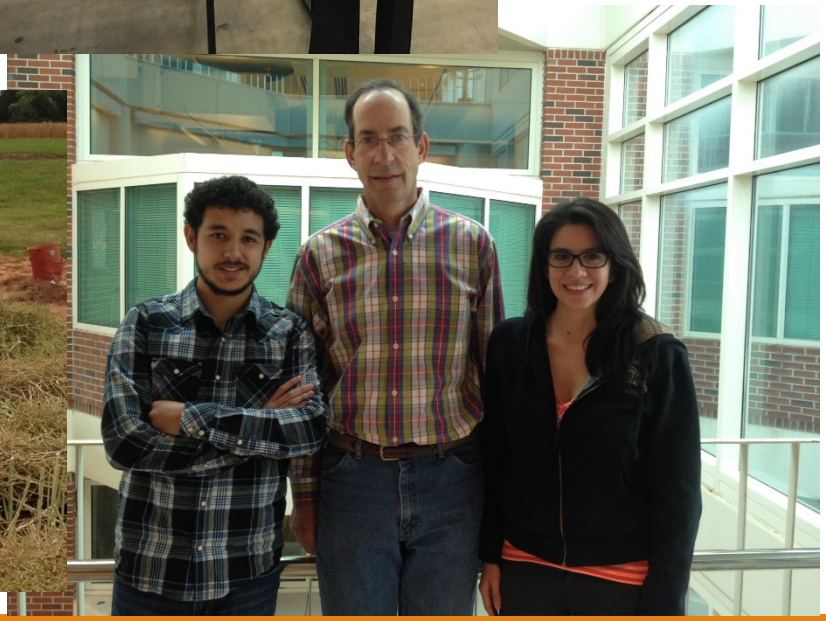
Outputs

Students

- Graduated 4 M.S. level students and 1 Ph.D
  - Funded a post-doc that has now been placed in a faculty position
- Funded 14 undergraduate students
  - Contributed to the work of 2 undergraduate research scholars


Impact of Soil pH on
Winter Canola Cultivars in
the Southern Great Plains


Utilization of Plant Growth Regulators to Manage Winter Canola Growth and Development.
Sarah Kezar, Kody Leonard, Levi Scott, and Josh Lofton
Department of Plant and Soil Science
Oklahoma State University, Stillwater, OK
INTRODUCTION:
RESULTS:
OBJECTIVES:
EXPERIMENTAL DESIGN:



Going beyond the traditional outputs

Students are still a major output

- Going into industry with a knowledge of canola
- Local co-ops, seed dealers, consultants

Crop consultants

- Major part of Oklahoma and Texas agriculture
- Major interaction between these consultants and producers
  - Company
  - Private
- Focus of any educational program

Our programming has provided

- 18 CCA CEU over the last 2 years of programming for canola education

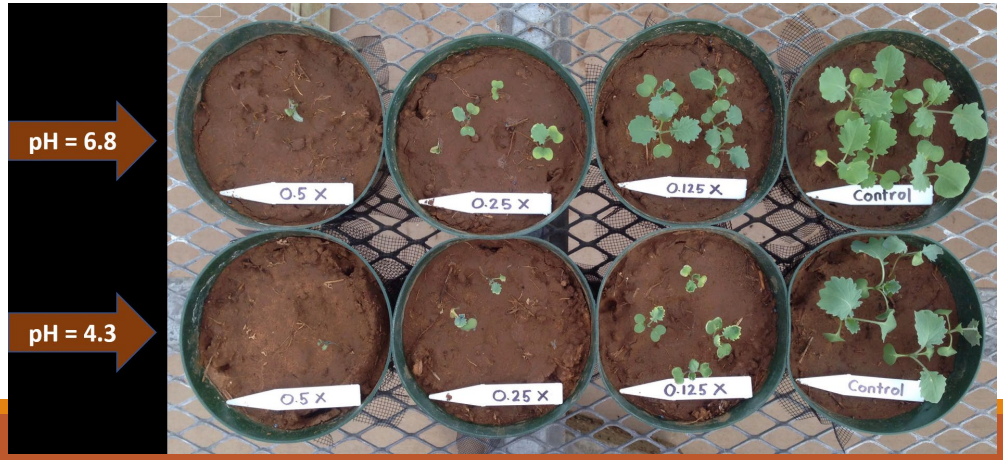
Looking forward

2018

- Integrating multiple parts of the system
- Working more how producers will look in-season

Giving a sneak peak

- Input management
  - Omission trials



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Questions?

Josh Lofton

Cropping System Specialist

Oklahoma State University

Josh.lofton@okstate.edu

Twitter: @osu_oilseeds

Blog: osucrops.com; osusorghum.com

Crop management

Cultivar selection

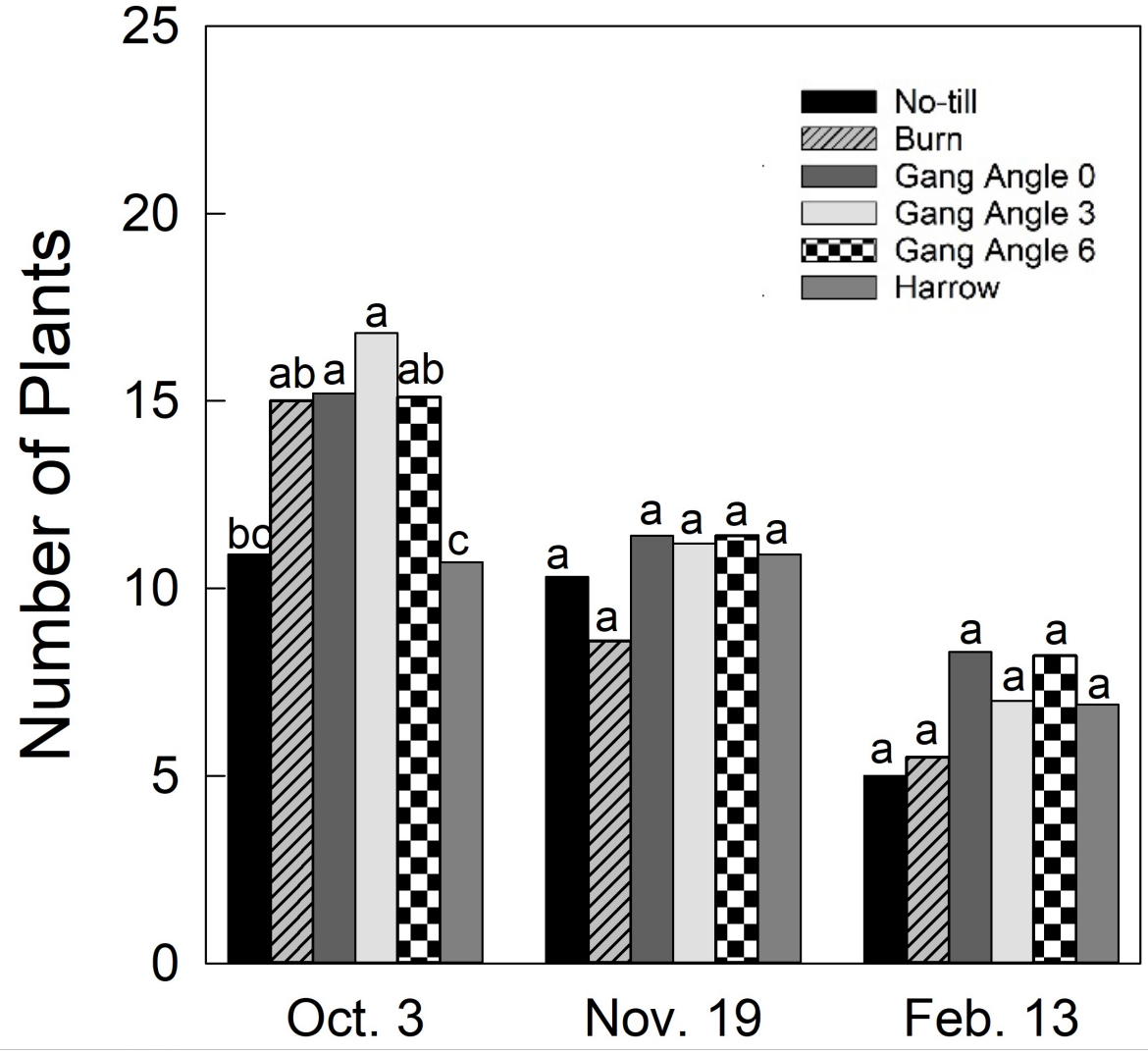
No-till production

- No-till has been a prominent system in the regions for decades
- Especially with recent droughty conditions
  - Systems are more sustainable
  - It has been common thought that canola performs worse in these conditions

Comparing tillage systems

Planted canola into a field with previous wheat residue

- Previous wheat yields
- Tillage treatments
  - No-till
  - Tillage (Harrow)
  - Burned residue
  - VT
    - 0, 3, 6 degree angle
- These were done on 500x20 replicated strips


Number of Plants
25
20
15
10
5
0
No-till
Burn
Gang Angle 0
Gang Angle 3
Gang Angle 6
Harrow
bc
ab
a
a
ab
c
a
a
a
a
a
a
a
a
a
a
a
a
Oct. 3
Nov. 19
Feb. 13

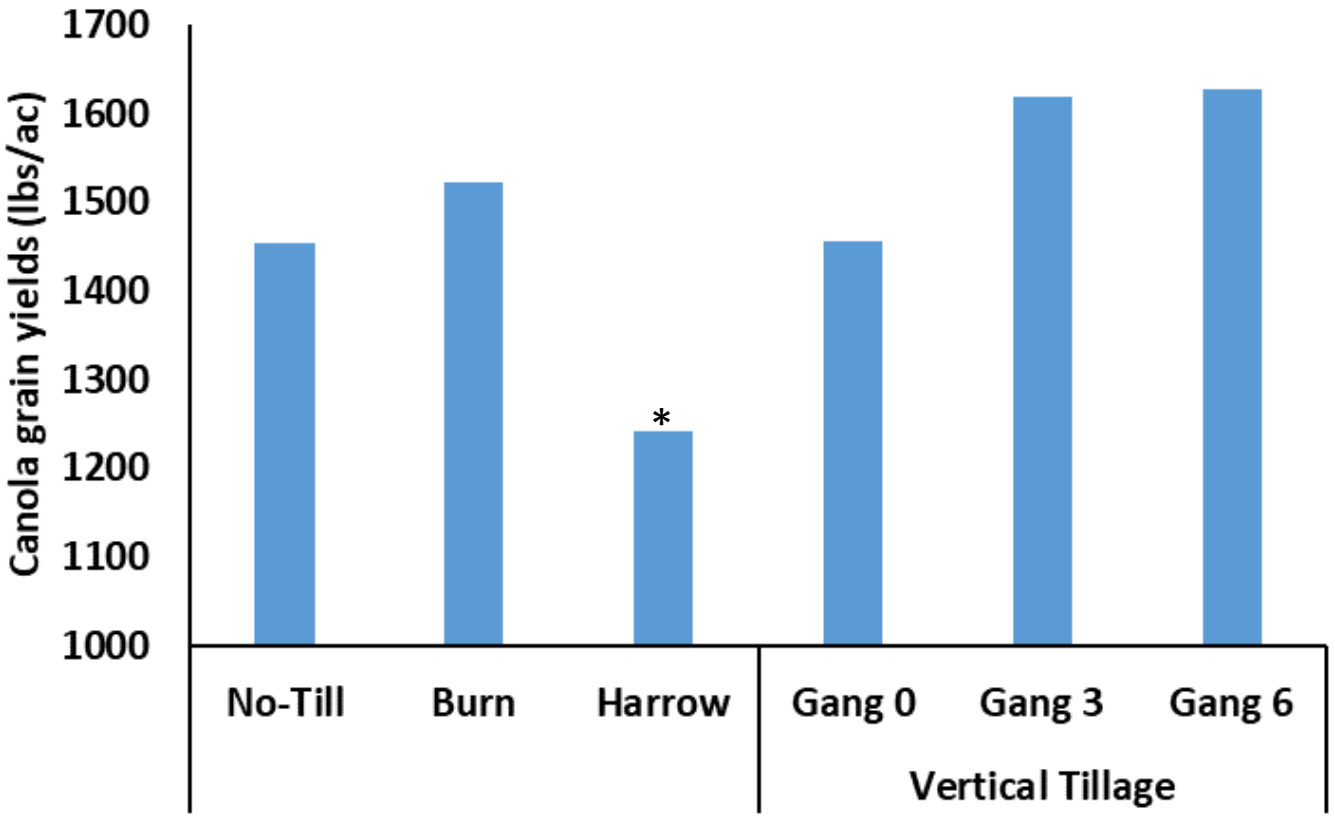
What did we learn?

Winter canola could be adequately grown in no-till settings

- Minimum tillage did improve early-season stands
- This benefit was not evident following winter green-up

Yields

- Greater yields were found where aggressive tillage did not occur


Canola grain yields (lbs/ac)
1700
1600
1500
1400
1300
1200
1100
1000
*
No-Till
Burn
Harrow
Gang 0
Gang 3
Gang 6
Vertical Tillage