

# Impact of August 2016 Floods on Arkansas Crop Production

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## **Highlights**

- **The recent floods in Arkansas have caused serious damage to crop production.** Many of the crops were in or near harvest stage. Sustained submergence of fields in flood water has either destroyed or severely damaged crop output and quality for harvest. The physical damage includes field losses of sprouting, mold, stalk rot and lodging, pod splitting and grain shatter. Post-harvest losses—quality discounts and rejection at delivery have occurred and will continue through this harvest season.
- **Flooding resulted from heavy rainfall.** Rain was particularly intense during the third week of August where parts of northeast Arkansas received more than 10 inches. By the end of August northeast Arkansas had a four-week accumulation of 8 to 12 inches—7 inches more than normal. East central Arkansas received a four-week accumulation during August of 6 to 7 inches—4 inches more than normal. And southeast Arkansas accumulated 8 to 11 inches over the month of August—6-8 inches above normal.
- **This report provides preliminary estimates of the extent of physical and monetary damage to Arkansas crops. The total value of damage is estimated in a range of \$45.6 to \$50 million.** Extension Agronomists, identified with their crop specialization have contributed written and quantitative assessments to this report.

## Pre-flood Forecasted Arkansas Crop Production

The National Agricultural Statistics Service (NASS), USDA released the *Crop Production* report on August 12, 2016. This report provides forecasts of state crop production. Estimates of forecasts area harvested and yields were based on crop condition information available August 1, 2016.

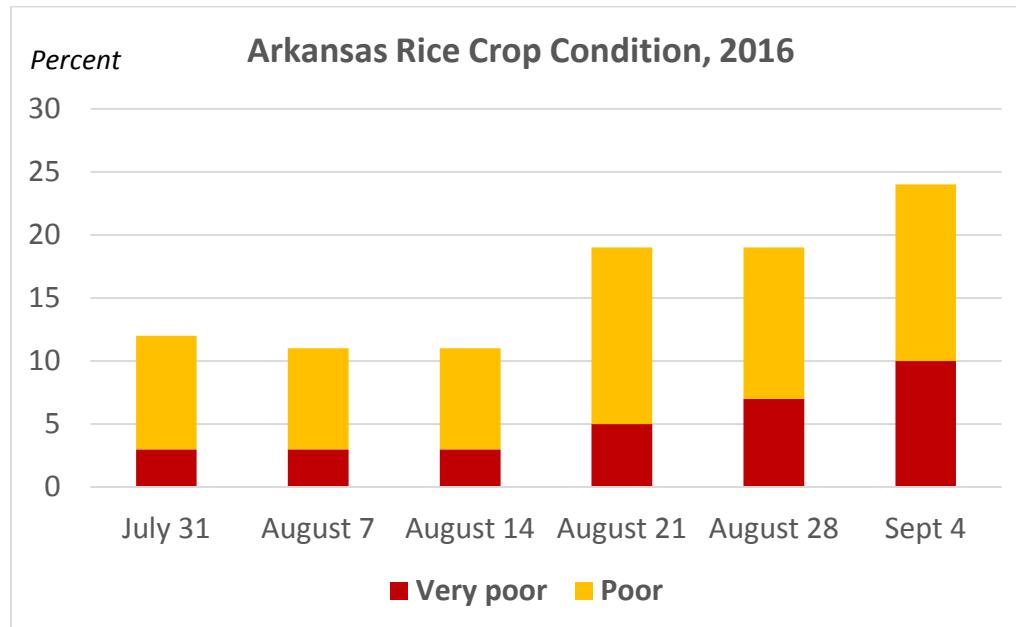
Table 1. Arkansas Crop Area Harvested, Yield, and Production 2015 and Forecasted 2016.

Crop	Production Unit	Area Harvested		Yield per Acre		Production	
		2015	2016	2015	2016	2015	2016
		(1,000 Acres)		(bushels)		(1,000 bushels)	
Rice	bushels	1,286	1,575	163.1	166.7	209,747	262,500
Soybeans	bushels	3,170	3,120	49.0	47.0	155,330	146,640
Corn	bushels	445	735	181.0	189.0	80,656	138,915
Sorghum	bushels	440	37	98.0	88.0	43,120	3,256
Cotton	bales	207	365	2.275	2.192	471	800

Source: NASS, *Crop Production* (August 12, 2016)

Arkansas crops deteriorated during the month of August. For all of the major crops the percent of crop rated as poor and very poor condition by NASS increased across the board. Figure 1 shows that the percent of the rice crop rated as very poor and poor increased from 11% during first week of August ending at 24% by first week in September.

Figure 1



Source: NASS, Arkansas Crop Progress and Condition Reports.

## Rice Crop Update – Jarrod Hardke, August 29 2016

Arkansas rice in 2016 started out on a near-record planting pace. Favorable conditions throughout the season pointed toward a high-yielding crop year. However, high temperatures during July created some concerns about pollination and grain quality.

Rice harvest had progressed only 2% before 10 consecutive days of rainy conditions began on August 13<sup>th</sup>. As the crop emerged from these conditions it became evident that areas of the state would have severe issues with crop submergence. Grain quality would also become an issue on a wider-than-expected area.

Total flooded acres are estimated near 40,000 with the majority occurring in Randolph (15,000 acres), Craighead (10,000 acres), Lawrence (8,000 acres), and Clay (2,500 acres) Counties. Estimated economic loss associated with flooding on these acres is over \$7,000,000 (Table 2).

Submergence of rice during the later stages of reproductive development through grain maturity can cause a wide range of effects. See ‘Managing Submerged Rice’ at: <http://www.arkansas-crops.com/2016/08/19/arkansas-rice-update-19-16/>. Losses in these fields will be associated with direct yield loss as some grain is not harvestable due to lodging while additional losses may be associated with reduced grain quality from staining and discoloration of kernels. Rice grain that has been completely submerged is considered ‘adulterated’ and should not enter the grain channel for human consumption. At this time it is anticipated that as many as 20,000 acres affected by flooding had grain submerged. This additional loss is in Table 2 as a total loss. If any of this is harvested and segregated as rice graded for non-human consumption it would receive a much lower price (as much as \$1.25/bu).

Table 2. Estimated loss of Arkansas rice production due to excessive rains and flooding in August 2016.

County	Planted Acres	Estimate of Crop Acres Affected	Percent Crop Loss	Estimate of Yield Loss (bu)*	Value of Crop Lost† (\$)
Randolph	35,072	16,000		666,800	\$3,000,600
Lawrence	104,971	8,000		333,400	\$1,500,300
Craighead	70,027	10,000		416,750	\$1,875,375
Clay	82,535	2,500		104,188	\$468,844
Jackson	113,431	2,000		83,350	\$375,075
Woodruff	61,176	750		31,256	\$140,653
<b>Limited loss</b>		19,250	25%	802,244	\$3,610,098
<b>Total loss</b>		20,000	100%	3,334,000	\$15,003,000
<b>Total</b>	467,212	39,250		4,136,244	\$18,613,098

\* USDA-NASS yield estimate of 7500 lbs/acre (166.7 bu/acre)

† \$4.50 per bushel (\$10 per cwt)

Rice that is lodged (fallen over) can often have sprouted grains under rainy conditions. However, these persistent rainy conditions resulted in sprouted grains on standing rice. The severity and extent of this occurrence has not been seen since the late 1970's. On an extremely limited basis it was noted in 2009. However, this year it is common to find sprouted grains in virtually every field that had grains near maturity at the time of the prolonged weather event, from south to north Arkansas.

The majority of these are not severe and it can be difficult to find with most reports involving no more than 1-2 sprouted kernels per panicle (typically less than 1% of grains). This does not usually lead to direct grain yield loss but rather milling yield loss. A grower will still receive payment for the weight of these sprouted grains (grain yield) but when it is milled (milling yield) to determine whole kernels versus broken kernels, sprouted kernels will break up and receive a lower value of payment. Observations are too limited at this point to draw definitive conclusions, but overall state milling yields may easily fall into the range depicted in the examples in Table 3.

Late season diseases such as bacterial panicle blight, blast, and sheath blight became increasingly evident after just the first few days of rain. Some losses associated with the increase in these diseases will be severe and management options are no longer available at this stage or do not exist. The rainy weather and delays in maturity also made rice stink bug management more difficult and prevented timely applications for management of yield and quality limiting stink bug populations.

Table 3. Example of low milling yield effects on rice price and net profit.

Description	Sample 1	Sample 2	Sample 3
Sample weight	162	162	162
Head rice weight	89	81	73
Brokens weight	25	31	36
Milling yield percentage	55/70	50/69	45/67
Value per hundredweight†	\$6.56	\$6.35	\$6.07
Difference in price/cwt	--	(\$0.21)	(\$0.49)
Value at 150 bu/A	\$442.80	\$428.63	\$409.73
Value difference at 150 bu/A	--	(\$14.18)	(\$33.07)
Value at 200 bu/A	\$590.40	\$571.50	\$546.30
Value difference at 200 bu/A	--	(\$18.90)	(\$44.10)

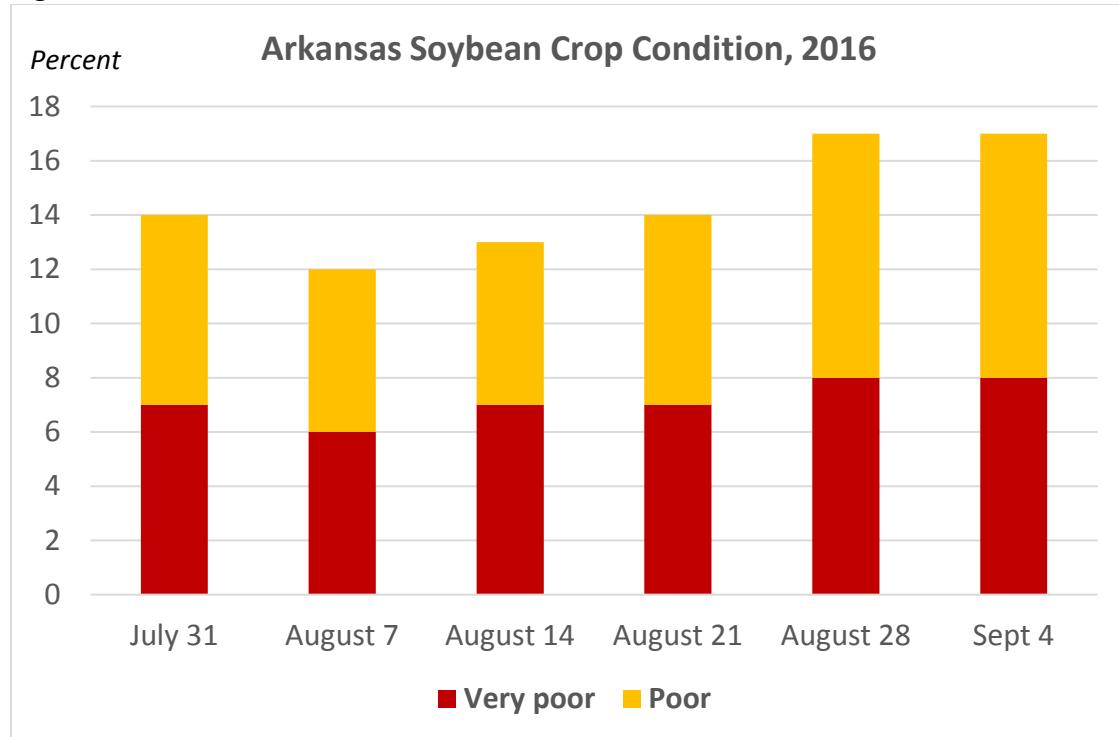
† Prices based on long-grain \$9.98/cwt for head rice and \$7.16/cwt for brokens.

## Soybean Crop Update – Jeremy Ross, August 29 2016

The 2016 Arkansas soybean crop was looking to be a good crop until the rainy, cloudy weather that persisted from around August 13 to August 22, 2016 caused an increase in disease pressure, flooded fields, pod splitting, and seed sprouting within pods.

Figure 2 shows that the percent of the Arkansas soybean crop rated as very poor and poor increased from 12% to 17% through the first week of September.

Figure 2.



Source: NASS, Arkansas Crop Progress and Condition Reports.

Flooding in Clay (2500 acres), Jackson (5,000 acres), Lawrence (12,000 acres), Randolph (8,000 acres), and White Counties (3,000 acres) potential could cause economic loss totaling \$10,000,000 (Table 4). This loss is due to reproductive soybean plants going completely under water for more than 48 hours. Many of these fields will have significant yield loss ranging from 50-100%, and additional loss due to quality issues.

I have received reports of split pods and/or seed sprouting within pods from the following counties: Ashley, Chicot, Craighead, Crittenden, Desha, Lee, Lincoln, Prairie, and St. Francis. Most of the affected fields seem to be early- to mid-April planted fields. The percentage of fields being reporting having this problem range from less than 1% to as many as 15% in individual counties. Estimates of yield damage are less than 5%, but the major issue is what will the seed quality be during harvest. Many of the same counties are reporting soybeans that

have poor seed quality with mold, purple seed stain, blackened seed, and shriveled seed within pods.

Table 4. Estimated loss of soybean production due to August 2016 flooding.

County	Planted Acres	Estimate of Crop Acres Affected	Percent Crop Loss	Estimate of Yield Loss (bu) <sup>1</sup>	Value of Crop Lost <sup>2</sup>
Clay	107,000	2,500	75%	88,125	\$881,250
Jackson	117,000	5,000	75%	176,250	\$1,762,500
Lawrence	65,000	12,000	75%	423,000	\$4,230,000
Randolph	33,000	8,000	75%	282,000	\$2,820,000
White	32,000	3,000	75%	105,750	\$1,057,500
Total	354,000	30,500	75%	1,075,125	\$10,751,250

<sup>1</sup>USDA-NASS yield estimate of 47 bu/acre

<sup>2</sup>\$10.00 per bushel

In addition to the above problems, many producers are reporting an increase in late season diseases. Because of the wetter than normal conditions during mid-August, areal blight, *Cercospora* leaf blight, anthracnose, pod and stem blight, Frogeye leaf spot, and target spot are being reported across the State. Many of the fields reporting these disease problems are at or past our recommended growth stage for a fungicide application. Later planted fields that have not reached growth stage R5.5 and have any of the diseases mentioned above could benefit from a fungicide application to protect yield.

## Corn and Sorghum Crop Update – Jason Kelley, August 29 2016

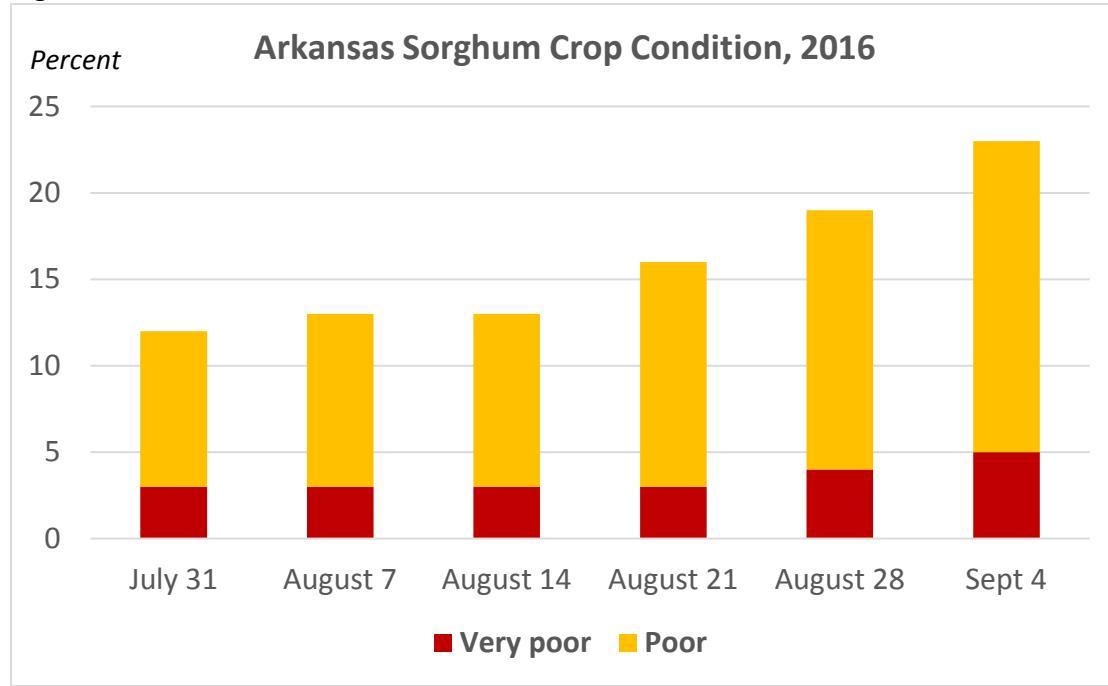
Rainfall during the week of August 13-20<sup>th</sup> was very detrimental to the Arkansas grain sorghum crop. Prior to the rainfall, an estimated 1% of the crop had been harvested, but a considerable percent of the acres was ready to harvest the week of the rain. The extended rainfall on mature grain sorghum caused wide-spread sprouting. More details can be found at: <http://www.arkansas-crops.com/2016/08/22/harvest-sprouting-sorghum/>. Grain sorghum planted in April through the first half of May was most severely impacted. Approximately 80% of the acreage was planted during this time.

Grain sorghum quality after the rain has been poor. Current grain grading guidelines state that kernel damage greater than 10% results in a grade of sample grade, which is poor quality and is generally not marketable in export channels. Levels of damage have varied considerably but most loads are reporting 5% to 30% damage. There have been several loads of grain that have been rejected due to low quality and producers have had to scramble to find other outlets to sell their grain. Some grain terminals are willing to buy damaged grain, but at a reduced price.

Currently some grain terminals are paying \$1.75/bu for damaged grain compared to the normal of about \$3.25 for good quality grain.

As depicted in Figure 3, Arkansas grain sorghum rated as poor and very poor increased from 12% at the first week of August to 23% by first week of September.

Figure 3



Source: NASS, Arkansas Crop Progress and Condition Reports.

Corn overall has fared better than grain sorghum. There is some grain sprouting in the ear, but overall grain sprouting in corn is much less than grain sorghum. There have been differences between hybrids on the amount of spouted grain found. Hybrids with a good shuck cover have much better grain quality than those hybrids with a loose shuck cover. There are more ear molds after the rains which is a concern for mycotoxin development. Stalk rots and lodging are becoming an issue in corn and will become more problematic if corn harvest is delayed further.

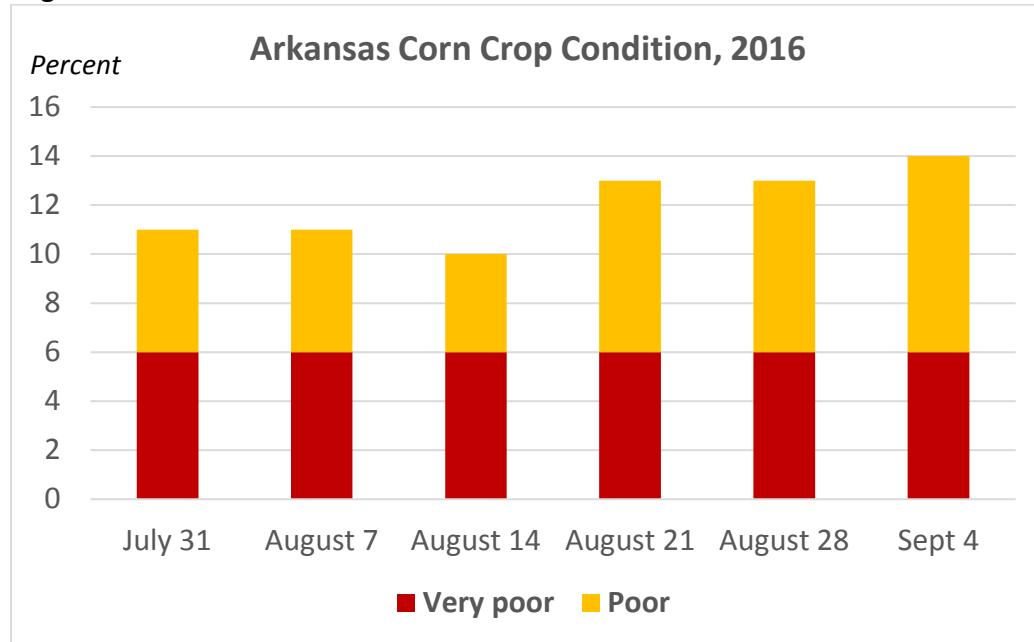
Flooded acres of grain sorghum or corn in Northeast Arkansas is relatively small compared to soybeans and rice. Lawrence (1500 acres corn and 300 acres grain sorghum) and Randolph (1600 corn and 350 acres grain sorghum) were the only counties reporting meaningful acres that were flooded. By far the bigger problem was grain sprouting.

Total loss from the rainfall (not flooding) is very high for grain sorghum. Statewide there were 40,000 acres of grain sorghum with an estimated yield of 100 bu/acre. Total sorghum value would have been approximately \$14,000,000 prior to the rain at \$3.50/bu. After sprout

damage on approximately 80% of the crop, value for the whole crop value has been reduced by approximately \$5,600,000 (assuming a price of \$1.75/bu for 80% of crop that is damaged).

Corn losses besides the counties of Lawrence and Randolph appear to be minor. Overall grain quality is still acceptable, but harvest needs to proceed without further delays to maintain quality. NASS reports on corn crop condition during August reflect a change from a combined poor and very poor crop condition of 10% prior to the severe rain to a combined rating of 14% by the first week of September.

Figure 4



Source: NASS, Arkansas Crop Progress and Condition Reports.

## Cotton Crop Update – Bill Robertson, August 29 2016

There was optimism about the 2016 Arkansas cotton crop prior to the extended cloudy and wet conditions that persisted from around August 13 to August 22, 2016. These conditions resulted in significant carbon stress, an increase in disease pressure, and hard locking of bolls that were opening during this period. The hard locking of bolls impacts yields and quality but it only significantly impacted our very early planted cotton which makes up a very small portion of the state's crop.

The National Agricultural Statistics Service August Crop Production report projects Arkansas producers to harvest 1052 lbs lint/A. Boll size and seed numbers per boll of the current crop looked good going into August. The Arkansas Boll Weevil Eradication Foundation (ABWEF),

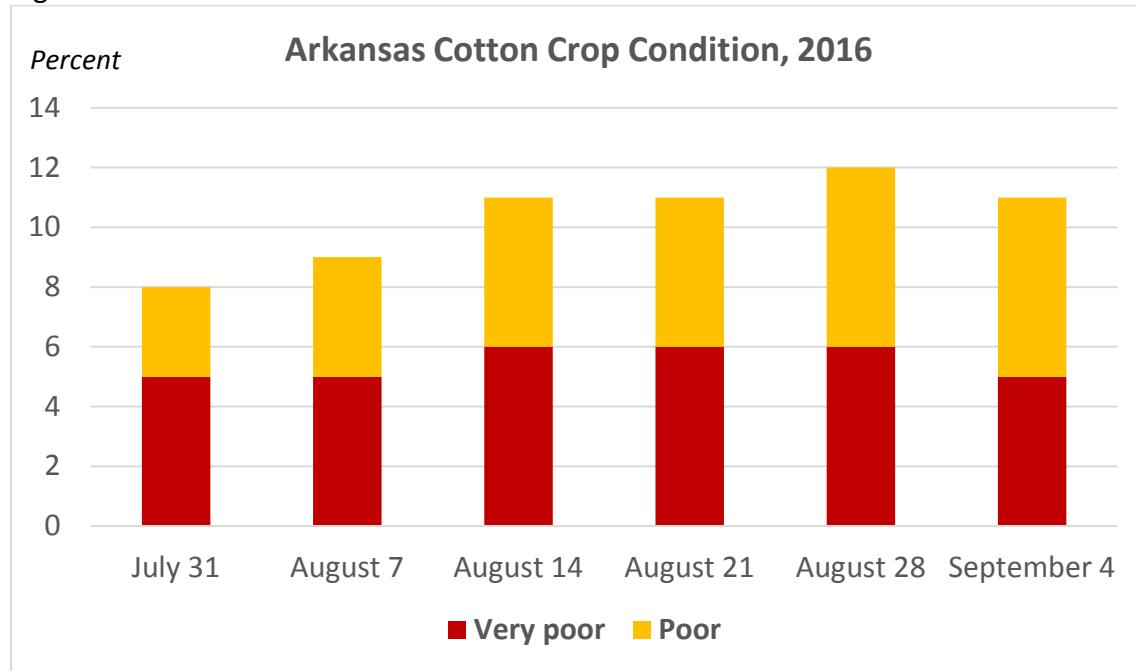
recently reported that their calculations of the current crop is just over 366,000 acres statewide.

Cotton has not experienced the flooding seen by other commodities in Arkansas. During the extended cloudy and wet conditions target spot (TS) and other diseases exploded. The significant carbon stress resulted in significant fruit shed. This shedding is primarily associated with the plant's inability to produce the energy needed to keep these small bolls because of the extended heavy cloud cover. However, in most fields these bolls were produced after the last effective boll population had been established; these are often referred to as phantom bolls. It is not clear at this time if economic damage has been sustained.

All these issues contribute towards uncertainty on the assessment of damage. Preliminary estimates of hard lock and boll rot percentages for the different ages of cotton generate a weighted average of about a 5% loss. Using a value of \$0.60/lb, the estimated value of damage could be as high as \$11,500,000. The highest loss is about 70% in the cotton acres planted late March - early April, but this acreage is only 1% of total acres. It is expected the August rainfall will not damage the later planted cotton which makes up about 20% of state acres.

There are still reasons to be optimistic about this crop. We desperately need the wet weather to end for a while and have sunny days and favorable temperatures to finish this crop successfully. Nevertheless, NASS reports on cotton crop conditions throughout August is reflected in Figure 5. The percent of crop rated poor and very poor increased from 8% at the beginning of August to an end of month estimate of 12% and a slight improvement in the first week of September to 11%.

Figure 5

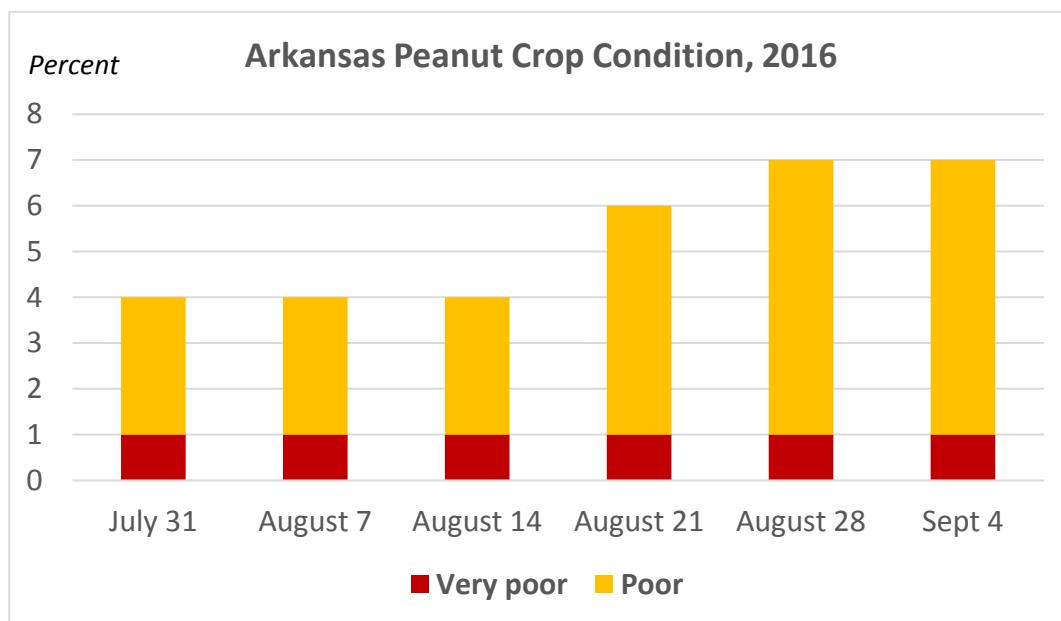


Source: NASS, Arkansas Crop Progress and Condition Reports.

## Peanut Crop Update – Travis Faske, August 29 2016

Peanut production in Arkansas is relatively new, however acreage planted in Arkansas has increased significantly in 2016. Much of the peanut crop is planted in Mississippi county on well-drained soils. As a result, damage from excessive August rainfall is expected to be minor. However, NASS peanut crop conditions rated as poor and very poor increased during the August month as shown in Figure 6. The share of the crop rated as poor increased from 4% at the beginning of August to 7% by first week of September.

Figure 6



## Specialty Crops Update – August 29 2016

August floods are believed to have damaged vegetable and melon farms. One producer reported a complete loss of 500 acres of cantaloupes with a market value of \$1.5 million. Other small farmers with cooperative contracts with grocery stores that market local produce had significant or complete losses and could not deliver on contracts. Information on this segment of Arkansas crop production is not well documented and therefore no estimates can be provided in this report.

## **Summary**

This report provides preliminary analysis and estimates of physical and monetary damage from August floods in Arkansas. Based on preliminary estimates for individual crops, a conservative value of damage is \$46.5 million. However, not included in this estimate are losses associated with delays in harvest and higher harvest expenses due to lodging. Furthermore, at this stage it is difficult to gauge the impact of quality deterioration and need for segregating damaged crops to avoid contamination of non-damaged harvest. Finally, this estimate does not include the damage incurred on small and large vegetable and melon farms. In this light a more reasonable estimate of damage is likely to be \$50 million and that may ultimately prove to be a conservative value. A final estimate of the damage will not be known with greater certainty until the harvest period is completed.