Program 2PA-2

How Should Global Weather Patterns Affect My Farm-Level Decisions?

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Daily and weekly weather forecasts garner attention from producers, researchers, policy makers and other stakeholders in the agricultural sector. However, global weather events, such as El Niño and Artic Oscillations, also can have significant effects on agriculture. Within the United States, during an El Niño cycle there is typically increased rainfall across the southern tier, especially from Texas to Florida (Figure 1). Additionally, during this period more intense storms tend to develop across the southeastern United States. During the La Niña cycle, there is below normal precipitation and higher than normal temperatures across the region. Meanwhile, positive and negative Artic Oscillation cycle push and pull more storms up through the gulf. Figure 2 shows an example of what happened in 2010 during a negative cycle.

Figure 1: El Niño Cycles, Source: NOAA

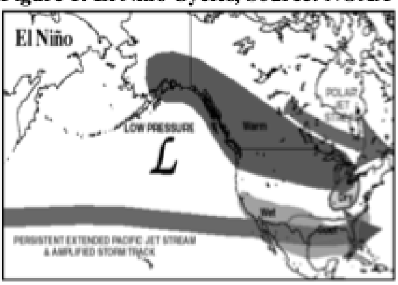


Figure 2: Summary of 2010 Weather during Negative Arctic Oscillation, Source: NOAA

In particular these events affect the number of days suitable for fieldwork (DSFW), for a given week, the producer has during tillage, planting, growing, and harvesting seasons. As a point of reference Table 1 shows typical cotton planting and harvest windows for three different states. The average number of DSFW for each state is shown in the DSFW column. At first glance, it looks like there should not be a problem with getting the crops planted or harvested, but the next step of the process is to think about the number of feasible hours are available in a day to plant or harvest. Beyond this what is the efficiency of your equipment set? Producers often overlook these elements that can lead to decreased farm profitability and during extreme weather events these losses can be exacerbated. One other time period that is being omitted in this presentation is the growing season and certain crops (e.g. cotton, corn, soybeans, etc.) have chemical applications, tillage or other operations that require DSFW to allow these tasks to be completed.

Table 1: Average Planting and Harvesting DSFW

State	Begin Planting	End Planting	Days	DSFW	Begin Harvesting	End Harvesting	Days	DSFW
Arkansas	April 24	May 31	37	28.8	Sept. 22	Nov. 24	62	52
Louisiana	April 17	June 2	45	44	Sept. 15	Nov. 13	58	53
Mississippi	April 25	June 9	55	40.3	Sept. 15	Nov. 17	62	25.6

Figure 3: Historical Arkansas DSFW (1975-2013)

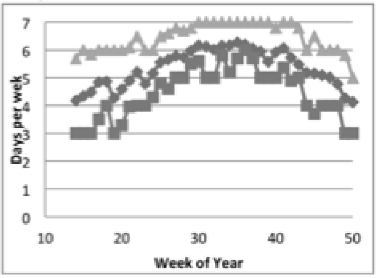
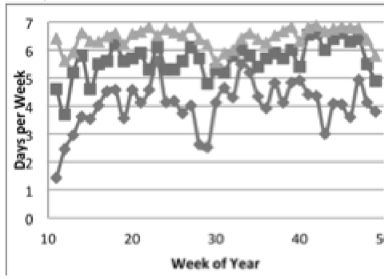


Figure 4: Historical Louisiana DSFW (2002-2013)



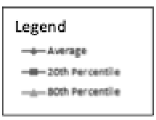
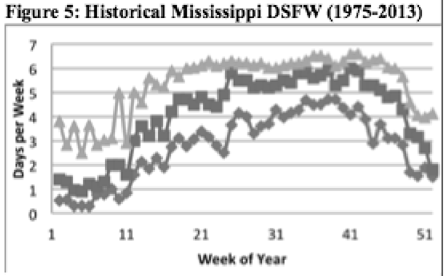


Figure 5: Historical Mississippi DSFW (1975-2013)



Figures 3, 4, and 5 illustrate the median, 20th, and 80th percentiles for DSFW for Arkansas, Louisiana, and Mississippi, respectively. These figures show the historical range of DSFW for each of the different state. Typically the planting seasons in these states start around the 14th week of each year and harvest will start around the 34th week of each year. From the producer perspective the ability to factoring in the historical DSFW to the whole farm planning process can help them make decisions on equipment sets, insurance coverage level, land purchases/rental, variety selection, etc. For example, a producer looking to purchase new equipment may choose to size equipment so that they would be able to plant and harvest everything without yield penalty for the 80th worst year. However, the downside to this equipment purchase is the financial implications to the operation for potentially purchasing equipment that is too big on average and cause undo financial stress on the operation.

Further complicating the operator's management decision is the impact of global weather patterns. The ability to incorporate this historical and future weather information into the decision maker's planning process can be a valuable resource for planning for the current and future cropping seasons. For example, in El Niño years when there is typically additional rainfall across the Southeast region of the United States may decrease the DSFW by 1 or 2 days during planting. At first glance this

may not seem significant; however, if your operation already struggles to get crops planted in a timely fashion this could incur a significant revenue penalty on the operation. Furthermore, operations employing different precision agriculture technologies might be conducting on-farm experiments. In this case, the effect is compounded because of the additional time needed to follow the experimental design. However those operators that plan ahead for these situations may lease additional equipment for planting or harvesting dependent upon the forecasted conditions, as an example. This ability to preplan though is predicated on the operators understanding of DSFW, the potential for different global weather patterns to manifest, and a keen understanding of the cost/benefit to the operation for taking action.
e field communication of research-
based information to the stakeholders. Participants will learn to access latest news, crop management guidelines, calibration of seed drill and harvest capacity determination, node-about-white-flower monitoring, field guides etc. Latest update to Flag the Technology Cloud (FTTCloud) app for Android and iOS devices will also be shared.

Notes: