Assessing the Real Value of H2A Farm Labor Inputs: A Dynamic Modelling Approach

Hofner D. Rusiana
Department of Agricultural and Applied Economics
University of Georgia, Athens, GA 30602-7509.
Email: hrusiana@uga.edu

Cesar L. Escalante
Department of Agricultural and Applied Economics
University of Georgia, Athens, GA 30602-7509.
Email: cescalan@uga.edu

Luis M. Pena-Levano
Department of Agricultural Economics
Purdue University, West Lafayette, IN 47907
Email: lpenalev@purdue.edu

FIRST DRAFT

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1. BACKGROUND

Crop production is one of the major industries in the United States. Agriculture and agricultural-related activities contributed about $1 trillion to US gross GDP [about 5.7% GDP-share] in 2014 (Supp. Fig. 1). According the 2007 census, this was the main source of income of about 2.2 million farms. This sector of the economy provides about 11% of US employment. From the 21 million [full- and part time] jobs, 2.6 million of these jobs (Supp. Fig. 2) are direct on-farm employment (USDA 2017).

Agricultural production cycle has fluctuations in its needs of labor, depending on the crop and length of growing, type of labor required (unskilled or skilled job), harvesting period, management system, level of technology, among others. Seasonal unskilled farm labor has usually been supplied primarily by foreign workers. However, the stricter enforcement of immigration policies has adversely influenced conditions in the farm labor market. There is evidence that these policies affected an estimated 12 million unauthorized immigrants in the country, 40% of whom are hired as farm workers (Seid, 2006; Levine, 2004).

The exodus of illegal immigrants that vacated farm work positions they previously filled in could have been the best coincidental remedy to the grave unemployment situation that the economy has been facing during these recessionary times. However, much to the surprise of everybody, the availability of unfilled farm jobs did not really help ease the unemployment situation. In 2012, the USDA released the results of a simulation analysis conducted to evaluate *how changes in the supply of foreign workers would affect the long-run financial performance of the national economy*, including the farm sector (Zahnizer, et al., 2012). This study's results indicate that a large reduction in the supply of foreign-born workers in all U.S. industries would

cause sizeable decreases in national output and export levels. In addition, there is evidence in fluctuation in the supply of domestic unskilled farm labor. Many of the potential farm workers shunned away from the demanding, more strenuous farm work or performed poorly (low productivity) even when paid attractive wage rates.

Given such frustrations and disappointments experienced by farm businesses in hiring domestic workers for seasonal farm work, farmers look to the federal government's *H2A Agricultural Guest Worker Program* as a legal hiring alternative. The program allows U.S. farmers to temporarily hire non-immigrant foreign workers to perform full-time temporary or seasonal farm work when domestic workers are unavailable (GAO, 1997). However, the H2A program has not been a popular hiring alternative among many farmers. Even though the program is not subject to a statutory numerical limit (i.e. there is no upper cap on the number of petitions or positions filed for certification), the number of certified or approved H2A positions remains only as a small fraction of the total number of workers hired by farm businesses in each year. For instance, in 2011 there were around 55,000 approved H2A positions, which represent only about 7% of the total number of hired farm workers (748,800) that year (Bruno, 2012).

The low farmers' participation rate in the H2A program could be attributed to (1) bureaucratic processing, and/or (2) timeliness issues and the cumbersome requirements that farmers must comply with. In addition, the H2A program establishes rules to protect the foreign workers from abusive employers. Among them: (i) it sets wage requirements, (ii) it establishes minimum standards for the provision of housing, transportation, and meals, (iii) and workers' compensation, to cite a few (Mayer, CRS Report to Congress, 2008).

Georgia's agricultural production is an important economic industry for the state. A total of 9.6 million acres of land is devoted to food and fiber sector. In 2012, the 42,000 Georgia's farm

sold about $9.2 billion in agricultural products (including crops and livestock outputs). Among Georgia's commodities, the most important are: broilers, blueberries, cotton, peaches, tobacco and tomatoes. These are ranked nationally due to their level of production. The poultry and egg industry represent almost half of the total Georgia's farm production, while 2,600 farms grew cotton. Thus, farm labor shortage in agriculture could represent a threat for Georgia's economy, which supports more than 75.000 jobs in the state (Flatt 2017). This situation is similar for the South-East U.S. states.

Thus, our research aims to provide a detailed analysis of the H2A provisions from the producer's viewpoint and its effectiveness in mitigating shortages of seasonal farm labor. This study focuses on *how the farms' reliance on seasonal unskilled labor could inevitably subject them to the restrictive provisions of the new H2A program*. This evaluation includes (i) summary statistics of the farmers surveyed, (ii) the impact of the real value (cost) of the H2A program on farms' profitability and viability, and (iii) the determination of an appropriate (ideal) cost structure of the H2A program that will ease its use by small farmers and more compatible to the farm business' operating profit goals. This project uses econometric modeling together with optimization-simulation analysis. Hence, our study produces results with important implications and suggestions for farmers' business strategic actions – all of the grand goal of sustaining the viability of organic farms in the Southeast.

2. METHODOLOGY

2.1 Survey on farmers' perception of the H2A program

This survey study has been funded by the *Southern Sustainable Agriculture and Research Education* (SARE) grant. Information from farms located in Georgia and North Carolina were collected by agricultural economist from the University of Georgia and Fort Valley State University. Specifically, 956 organic and conventional farmers were surveyed with respect to their experience with the H2A hiring process, the evaluation of the H2A labor force' quality of work and type of work exercised, effectiveness in meeting the farms' targets, among other aspects. This survey was conducted in the second half of 2015 through mailing. A total of 46 responses were received (4.8% response rate).

The respondent's overall profile are farms with 20-40 years of operation under conventional farming with incomes (in 2013) below $1 million and possess 500-1000 acres. Their activities are concentrated mostly in grains, alfalfa, pasture and livestock. The farm business structure is single proprietorship or family farm partner/corporations. The farm owner has typically a bachelor degree, with experience in the area and an age between 50-70 years old. The summary of the survey is further described in Annex 1.

In terms of their experience and perception of the H2A program, farmers seem to need H2A workers mostly during harvesting periods (highest applications filed) whereas the highest intensity for H2A labor is required during the value-added production stage. On average, the duration of the application takes less than 30 days, but the foreign workers arrive 30-60 days after the application is approved. Most of the farmers (~70%) found reasonable the documentary requirements to support the application, whereas most of them (~92%) received significant/full assistance. In

particular, the North Carolina farmers listed *North Carolina Growers' Association* (NCGA) as their external support agent.

Using the gathered information, we evaluate the possible relationships between their perception of the H2A program and the farm and owners' profile. The conclusions of this analysis are useful in order to understand if there is any statistical difference in farmers' preferences for the H2A program.

2.2 Data collection on from farm's financial status

Production and financial data is collected of different farms from North Carolina, South Carolina, and Georgia. Each farm represents one of the following enterprise groups: cotton, corn, soybeans, sorghum, wheat. Each enterprise group is analyzed by first constructing the financial flow and then implementing simulation modeling for sensitivity analysis for each crop. We compare this results under different wages and labor availability under the H2A requirements to understand the implications on the financial net revenue.

2.3 The financial model and its sensitivity analysis

We implement a standard financial flow in order to calculate the net revenue for each crop:

$$\min \pi = [P(t) - VC]Q(t) - wL - FC$$

Here π is net revenue, which depends on the price (P), variable (VC) and fixed costs (FC). We separate the labor cost which varies in our program. In addition, P(t) for each crop follows a log-normal distribution which is obtained through historical monthly prices from 1968 to date.

Similarly, Q(t) is the production per acre. In this particular case, Q(t) is obtained through time series trending. This predicted production then is simulated using the prediction interval. Thus simulation is done 1,000 times using @Risk software for each combination of wage and labor. For this case, we consider three cases for wage and labor: (1) Wage and labor are assumed to be the values from the survey for each crop, and (2) wage follows the minimum standard of $7.25/hr under the H2A program condition

3. RESULTS

We present the base cash flow in Table 1. Here we present the case for the conventional-irrigated farm which is the most common practice in Georgia. In terms of profitability, under the 2015 conditions, only cotton and soybeans are profitable. All the prices exhibited log-normal distributions which were used in the simulation analysis. Each crop was simulated a thousand times. In terms of productivity (production per acre), we use a time series linear trend. We used this trend to forecast yields for 2017 and computed the predicted interval. Thus we used this values to obtain the predicted distribution for yield, and combined it with prices to obtain the probability distribution in which the net revenue for each crop was positive. Our simulations suggest that corn, sorghum and wheat are riskier agribusiness under the current conditions, with a likelihood higher than 50% that the net return can be negative. Cotton and soybean are moderately risky (Figure 3).

Under the H2A Program, which allows to obtain more labor at lower cost but it has some delays, the results shown in Figure 4 state that overall does increase the probability of obtaining a positive revenue, especially in soybean and wheat. For the other crops, the increase is less dramatic, however, considering we are providing results at a unitary scale (acre), this could represent a significant increment in revenues if we extrapolate the values by the average 500-1000

acres that each farmer has. This reflects that obtaining H2A labor could provide potential benefits if the delay is no substantial.

4. IMPLICATIONS

The timing of conducting this project is perfect as both the Senate and Congress have recently launched attempts to revisit existing legislation on H2A to identify areas of improvement in the current program provisions and procedures. Farmer groups nationwide have openly criticized the difficult, costly and cumbersome features of the current program. A meeting of minds between these two sectors would be crucial in resolving the farmers' farm labor scarcity predicament. This project has a strong potential of uncovering important issues that might help make the program a more useful and usable instrument to promote farm business growth.

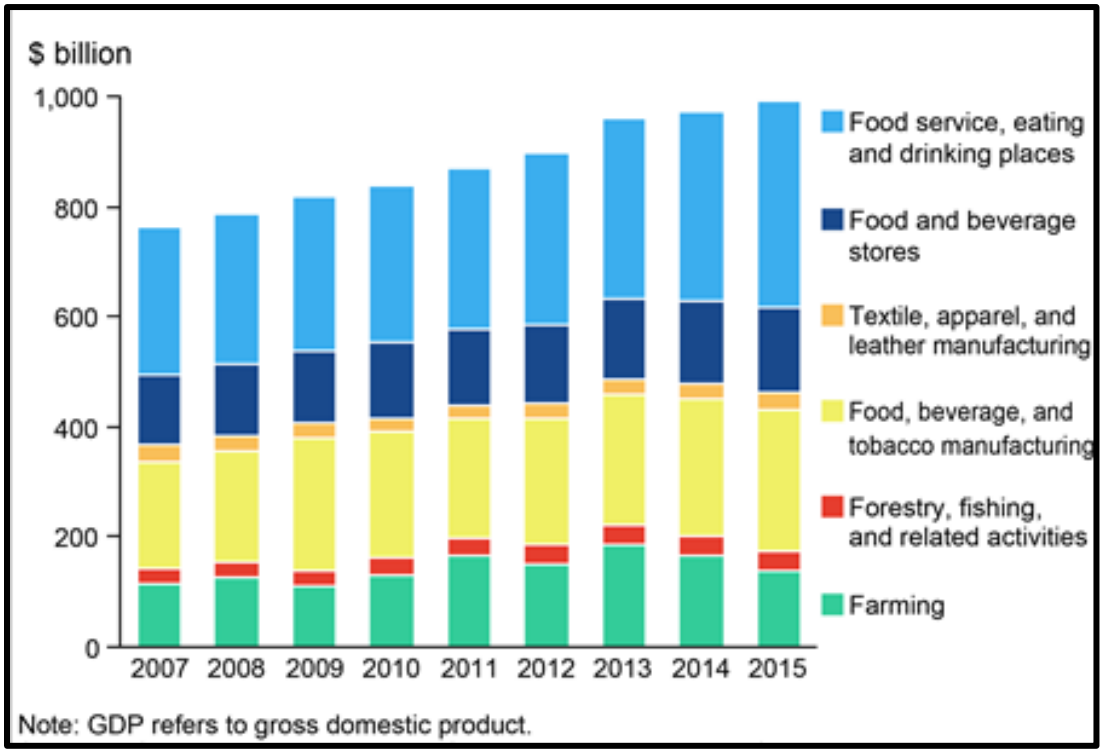


Fig. 1 – Value added to GDP by agriculture, food and related industries

[from 2007 to 2015]

Source: USDA, Economic Research Service using data from the US Department of Commerce, Bureau of Economic Analysis

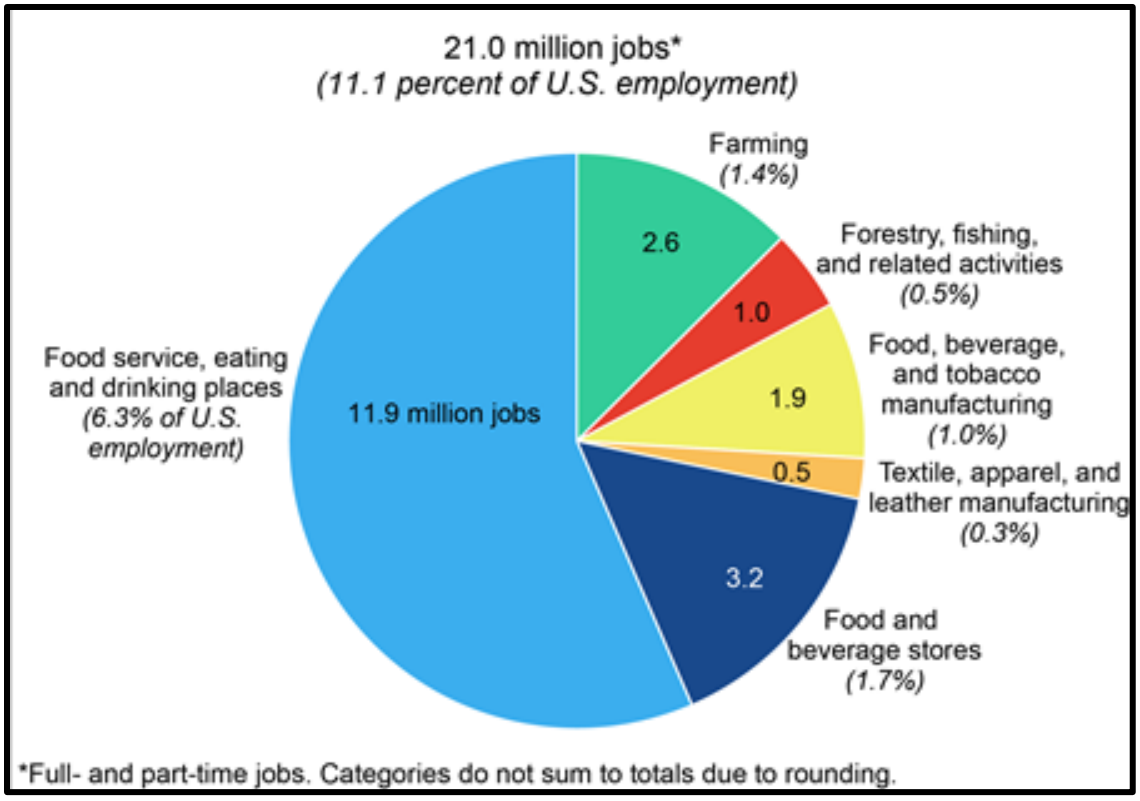
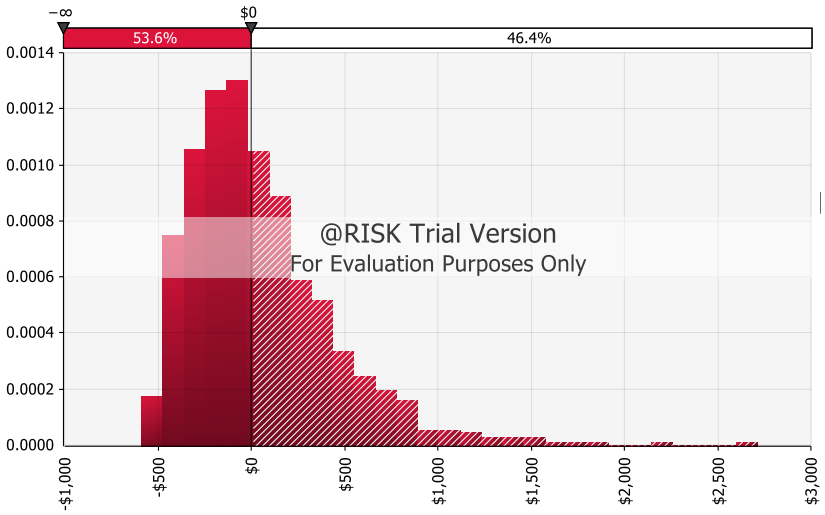
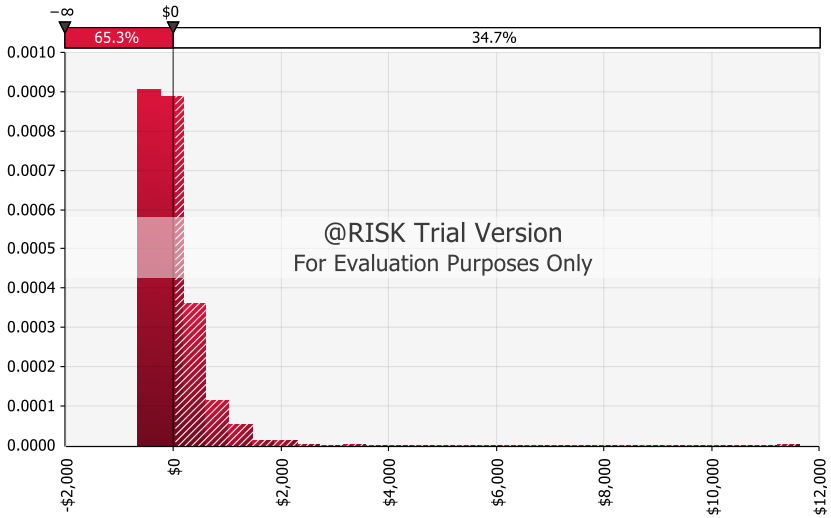


Fig. 2 – Employment in agriculture, food and related industries in 2015

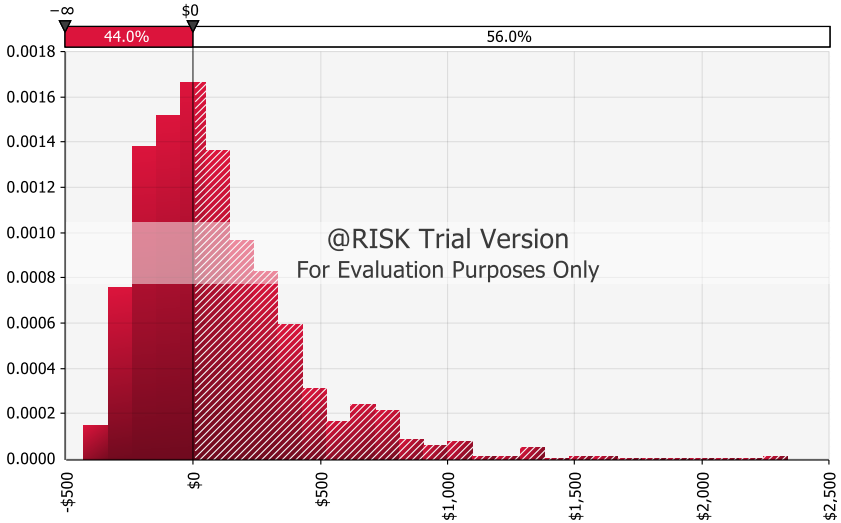
Source: USDA, Economic Research Service using data from the US Department of Commerce, Bureau of Economic Analysis



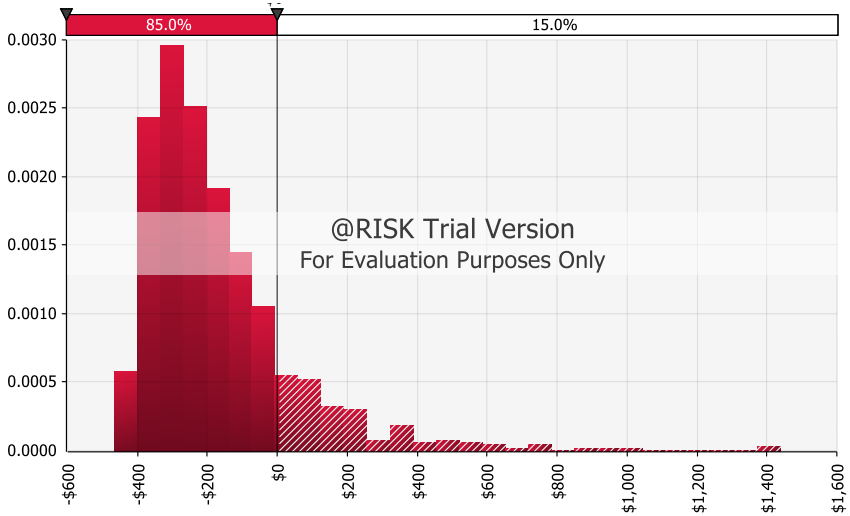
Cotton



Corn



Soybean



Sorghum

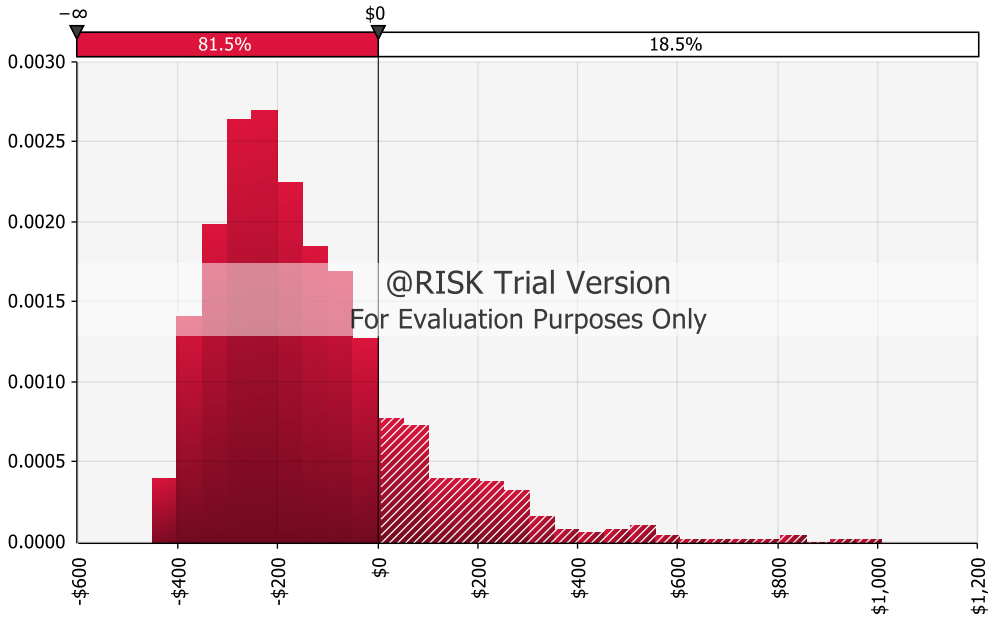
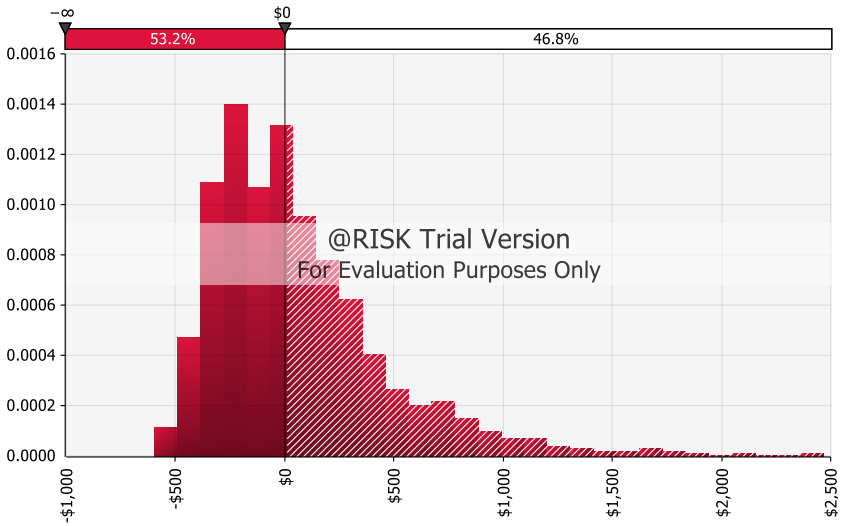
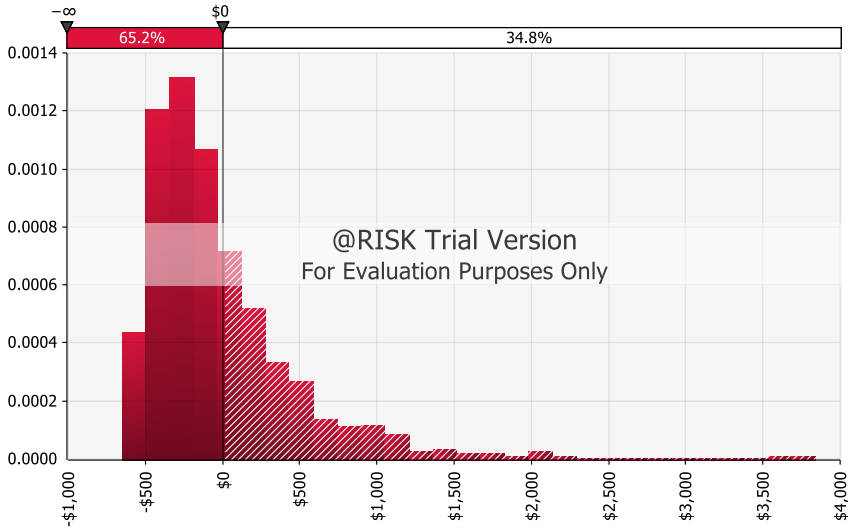


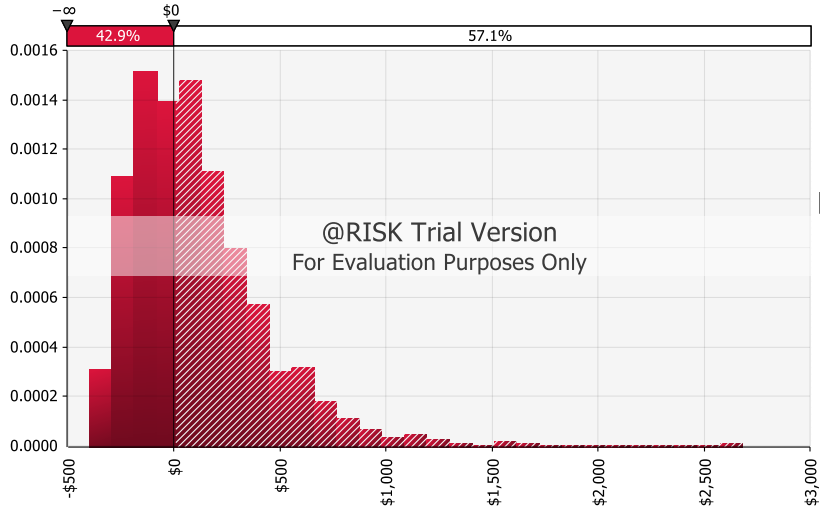
Fig. 3 Net return per acre ($/acre) and crop under changes in prices and yields under basic cash flow



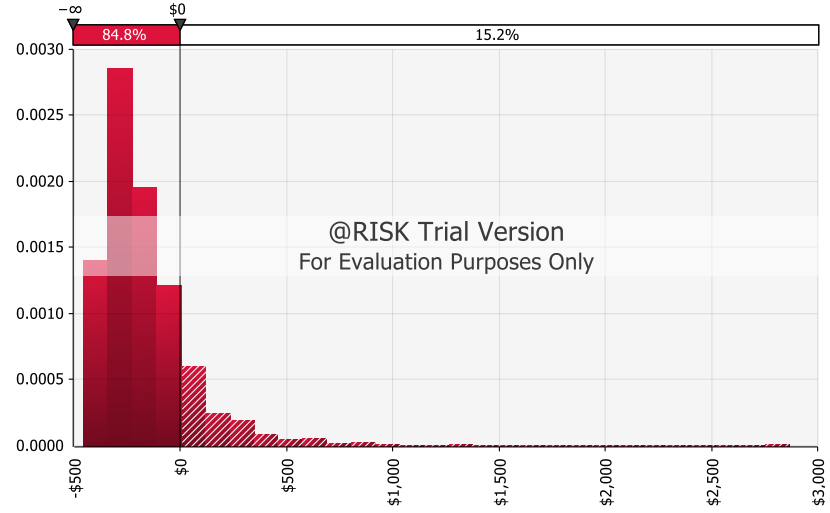
Cotton



Corn



Soybeans



Sorghum

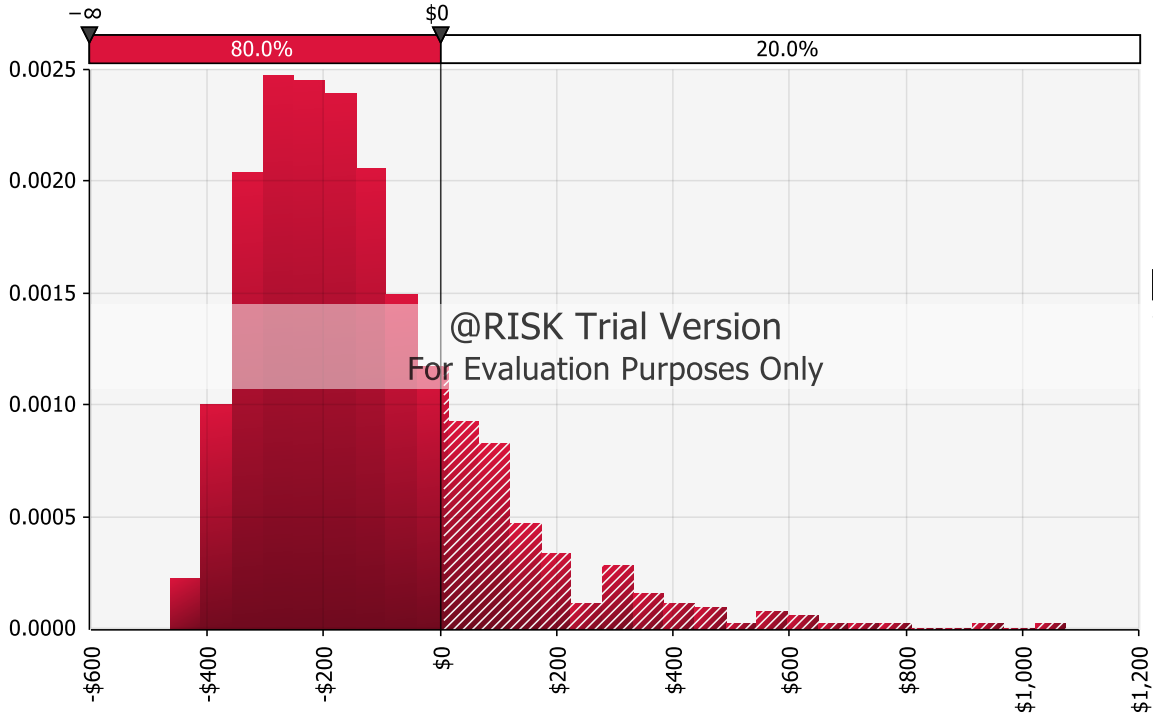


Fig. 4 Net return per acre ($/acre) and crop under changes in prices and yields under H2A Program

Table 1. Basic cash flow (in $/acre) for each crop

	Cotton	Corn	Soybeans	Grain Sorghum	Int Mgmt Wheat
EXPECTED YIELD per ACRE	**1,200 lbs**	**200 bu**	**60 bu**	**100 bu**	**75 bu**
EXPECTED SEASON AVG PRICE	**$0.70 /lb**	**$4.28 /bu**	**$9.77 /bu**	**$3.82 /bu**	**$5.26 /bu**
GROSS RETURN per ACRE	**$842**	**$855**	**$586**	**$382**	**$396**
VARIABLE COSTS per ACRE					
Seed	91	94	50	14	50
BWEP	1				
Fertilizer & Lime*	131	304	71	162	132
Chicken Litter					
Chemicals	100	37	63	21	34
Custom Application					
Hand Weeding	8				
Scouting	10				
Fuel and Lube**	39	21	17	21	29
Repairs and Maintenance	25	18	15	17	21
Irrigation***	81	81	51	41	20
Labor	28	12	10	12	14
Insurance	13	14	8	21	7
Land Rent					
Other					
Interest on Operating Capital	17	19	9	10	10
Gin & Warehouse (net after cottonseed)	-21				
Drying and Cleaning		61		31	7
Marketing and Fees					
TOTAL VARIABLE COSTS per ACRE	**$524**	**$662**	**$294**	**$349**	**$323**
RETURN ABOVE VARIABLE COST per ACRE	**$319**	**$193**	**$292**	**$33**	**$73**
BREAKEVEN PRICE (Variable Cost)	**$0.44 /lb**	**$3.31 /bu**	**$4.90 /bu**	**$3.49 /bu**	**$4.30 /bu**

FIXED COSTS per ACRE					
Machinery and Equipment	120	66	55	63	69
Irrigation	125	125	125	125	125
Buildings					
Miscellaneous Overhead	26	33	15	17	16
TOTAL SPECIFIED FIXED COSTS per ACRE	$271	$224	$195	$206	$211
TOTAL COST EXCL. LAND & MGT per ACRE	**$795**	**$886**	**$489**	**$555**	**$534**
RETURN TO LAND AND MGT per ACRE	**$48**	**-$31**	**$97**	**-$173**	**-$138**
BREAKEVEN PRICE (Total Costs)	**$0.66 /lb**	**$4.43 /bu**	**$8.15 /bu**	**$5.55 /bu**	**$7.10 /bu**
BREAKEVEN YIELD per ACRE	**1,132 lbs**	**207 bu**	**50 bu**	**145 bu**	**101 bu**

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