Measuring Moral Hazard in the Prevented Planting Provision Using Agronomic Data

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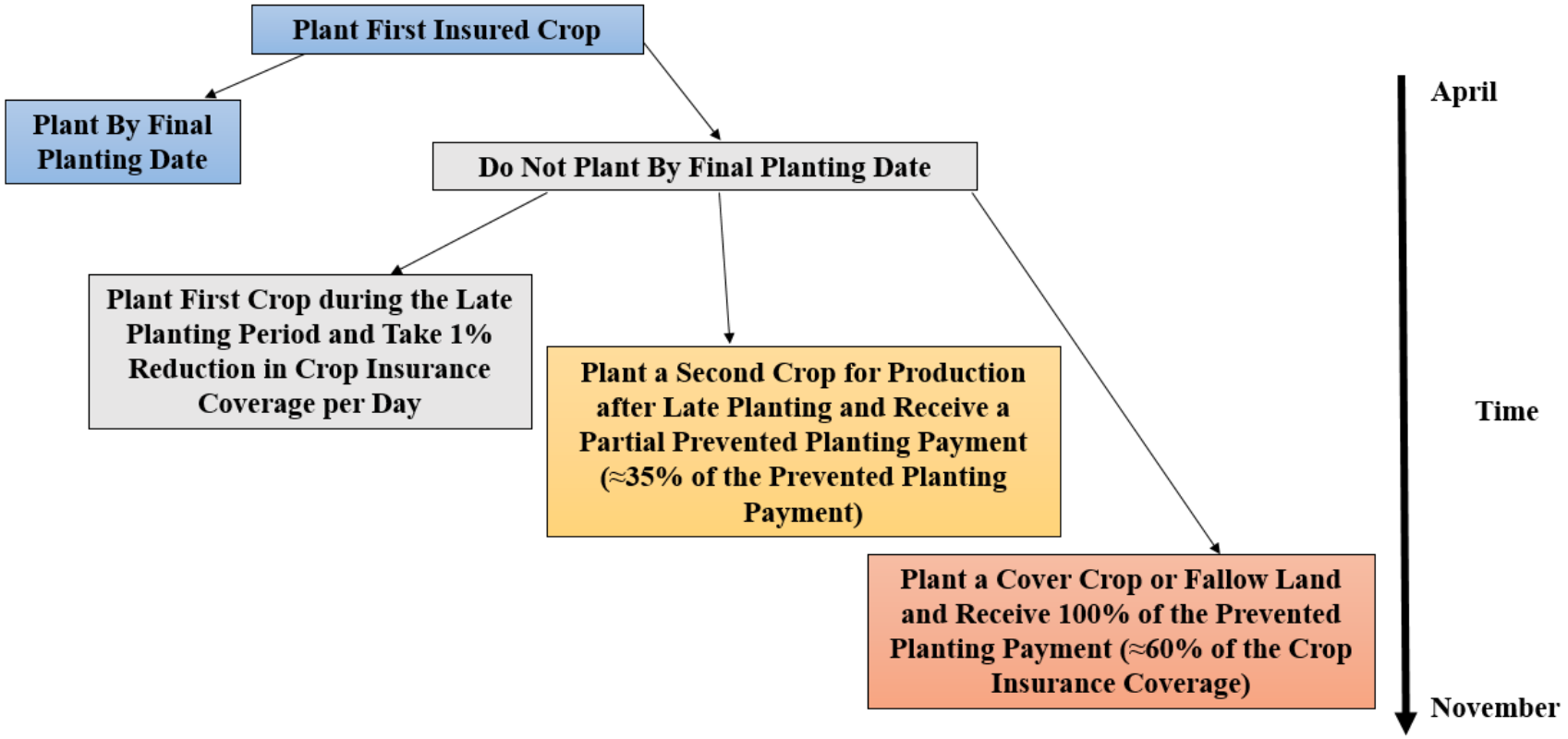
Southern Agricultural Economics Association
Jacksonville, FL
February 3-6, 2018

Prevented Planting



Prevented Planting

- Increases in prevented planting indemnity payments over the last two decades has triggered investigations
- Audit found prevented planting provision is more vulnerable to fraudulent claim than other crop insurance provisions
- Also, reported prevented planting indemnities exceeded estimated losses from 2008-2011 by more than $480 million.

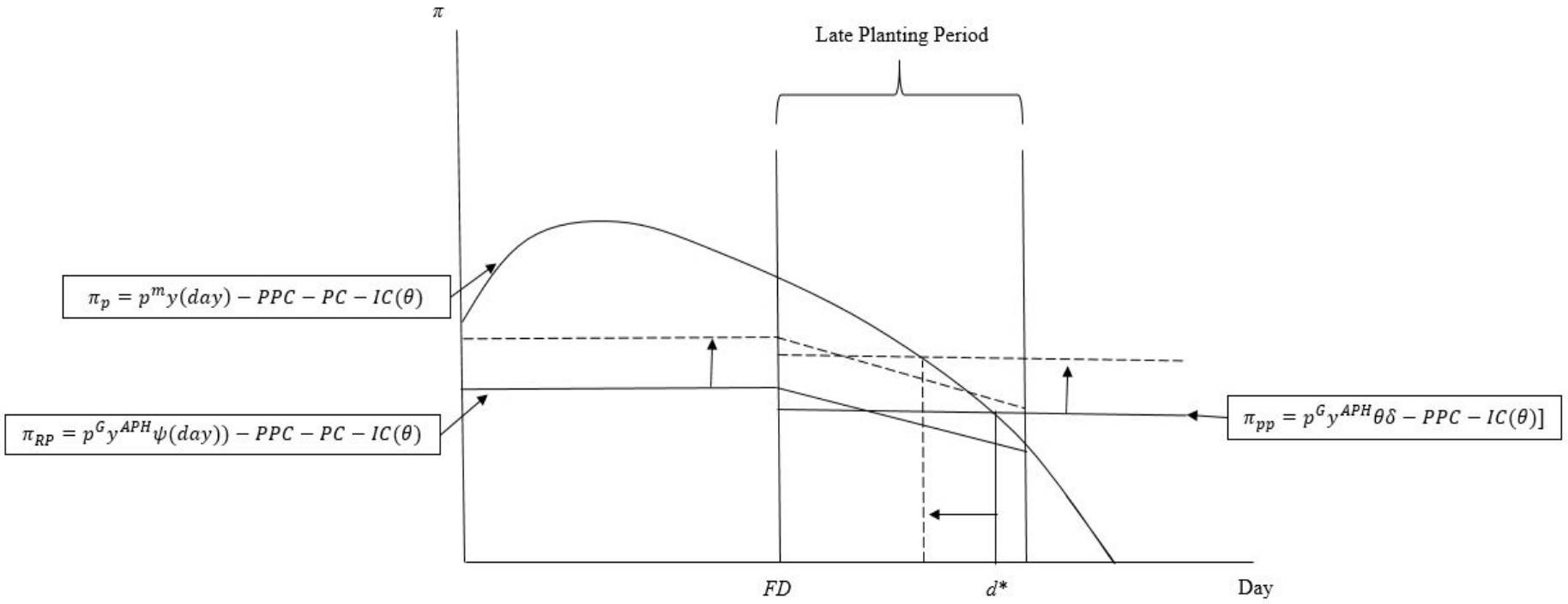
Prevented Planting

- RMA decreased prevented planting payment structure in 2017 from 60% to 55% for corn
- Accurately align prevented planting indemnities with the estimated pre-planting costs for corn
- RMA indicated that coverage factors for other crops will likely be adjusted in the future

Objective

- Determine how changes to the prevented planting coverage factor impact corn and soybean producer's decision to plant their insured crop during the late planting period or abandon production by accepting the prevented planting indemnity payment
- Implications of changing the prevented planting coverage factor on producers' production decisions and moral hazard.

Theory


π
Late Planting Period
$\pi_p = p^m y(day) - PPC - PC - IC(\theta)$
$\pi_{RP} = p^G y^{APH} \psi(day)) - PPC - PC - IC(\theta)$
$\pi_{pp} = p^G y^{APH} \theta\delta - PPC - IC(\theta)]$
FD
d^*
Day

Estimation & Analysis

- Corn and soybean yield response function to Julian day and substituted in profits function to give net returns by planting date
- Find the date a producer would be better off taking the prevented planting payment over of planting during the late planting period
- Analyses was performed at purchased coverage levels of 60%, 70%, and 80%
  - Each of these coverage levels, we assume the prevented payment coverage factors to be 50%, 55%, and 60%
  - For each of the prevented payment coverage factors, we also estimate how a hypothetical provision requiring cover crops to be planted impacts a producer's decision

Data

- Corn (4-year) and soybean (3-year) planting date experiments from West Tennessee were used

Summary of data used to calculate profits and crop insurance payments		
Data	Corn	Soybean
Market Price ($/bu)	$5.15	$11.87
Guaranteed Price with Revenue Protection ($/bu)	$5.35	$12.09
APH yield (bu/acre)	152	43
Pre-Planting Production Cost ($/acre)	$148	$152
Post-Planting Production Cost ($/acre)	$399	$256
Revenue Protection 60% Coverage Premium ($/acre)	$9	$17
Revenue Protection 70% Coverage Premium ($/acre)	$15	$25
Revenue Protection 80% Coverage Premium ($/acre)	$42	$62
Note: Basic unit structure was used to find crop insurance premiums. Source USDA RMA calculator		

Results

Planting day in the late planting period when the profit from prevented planting payment become greater than profits from planting corn			
Policy Scenario	Revenue Protection 60%	Revenue Protection 70%	Revenue Protection 80%
Prevented Planting Payment Coverage Factor of 60%			
Without Cover Crop	June 2nd	May 30th	May 27th
With Cover Crop	June 6th	June 3rd	June 1st
Prevented Payment Coverage Factor of 55%			
Without Cover Crop	June 6th	June 3rd	June 2nd
With Cover Crop	June 10th	June 7th	June 6th
Prevented Payment Coverage Factor of 50%			
Without Cover Crop	June 8th	June 5th	June 4th
With Cover Crop	June 12th	June 9th	June 8th
Note: The late planting date for Tennessee corn is May 20th through June 14th.			

Results

Planting day in the late planting period when the profit from prevented planting payment become greater than profits from planting soybean			
Policy Scenario	Revenue Protection 60%	Revenue Protection 70%	Revenue Protection 80%
Prevented Planting Payment Coverage Factor of 60%			
Without Cover Crop	After Late Planting Period	After Late Planting Period	After Late Planting Period
With Cover Crop	After Late Planting Period	After Late Planting Period	After Late Planting Period
Prevented Payment Coverage Factor of 55%			
Without Cover Crop	After Late Planting Period	After Late Planting Period	After Late Planting Period
With Cover Crop	After Late Planting Period	After Late Planting Period	After Late Planting Period
Prevented Payment Coverage Factor of 50%			
Without Cover Crop	After Late Planting Period	After Late Planting Period	After Late Planting Period
With Cover Crop	After Late Planting Period	After Late Planting Period	After Late Planting Period
Note: The late planting date for Tennessee soybeans is June 15th through July 5th.			

Take Home

- Corn producers would be better of abandoning profitable corn production and taking their indemnity for the majority of the days in the late planting period
  - Moral Hazard
- Reducing the prevented planting coverage factor for corn could likely reduce moral hazard
  - Degree depend on the coverage level
- Moral hazard is not likely to occur for soybean production

Parameter estimates for the corn and soybean yield response function to planting date		
Parameter	Corn	Soybean
Intercept (β_0)	108.66**	-59.38**
Slope (β_1)	2.6099***	1.5828***
Quadratic (β_2)	-0.0159***	-0.0056***
Number of Observation	140	660
Note: Single, double, and triple asterisks (*, **, *) represent significance at the 10%, 5%, and 1% level. Units are reported in bu/acre.**		