ESPAE GRADUATE SCHOOL OF MANAGEMENT
ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL

WILL I BE PAID AFTER A LOSS?
Comparing Index Insurance with Individual Insurance in Ecuador

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In this Presentation

1. The insurance market in Ecuador
2. How does the current insurance contract work?
3. Research objectives and methodology
4. Preliminary results from research
5. Contract comparison using 2010 data
6. Conclusions

The Crop Insurance Market in Ecuador

- Only one insurance company (QBE-Seguros Colonial), why?
  - Agriculture is a high-risk activity and it has shown a high covariant risk;
  - Low technological level of most farmers;
  - Low quality information on weather and yields
- Most insurance policies channeled through the State Bank Banco Nacional de Fomento (BNF)
  - The insurance is mandatory

The Crop Insurance Market in Ecuador

- The government is working with Colonial since 2010 to extend this type of contracts to small farmers by providing a 60% premium subsidy
- There is an Agricultural Insurance Unit at the Ministry of Agriculture (UNISA)
  - UNISA regulates, coordinates and promotes the subsidy and provides training for farmers.
- There are currently 11 products covered by this subsidy
- The program so far has achieved about a 30% increase of the insured area (currently 43.000 ha.)

The Conventional Insurance Contract

- Coverage: drought, frost, hail, flood, excessive humidity, strong winds and natural fire.
- Premium: between 2 and 9.5% of production costs
- Indemnity payments:
  - When the value of the harvest is…
    - Larger than the insured amount: no payment occurs
    - Smaller than the insured amount: the payment is the difference between the insured amount and the value of the harvest, minus a deductible (usually 30%).

The Conventional Insurance Contract

- How is a loss determined?
  - Farmer must file a claim
  - First visit to the parcel in order to determine the cause of the damage
  - Second visit at the time of harvest in order to determine the amount of harvest
- **Problems:**
  - High operational costs
  - Moral hazard
  - Operationally complex for small farmers

Our Research

- General objective: To analyze the viability of index insurance in Ecuadorian agriculture.
- General Methodology:
  - Create shadow index insurance contracts
  - Evaluate which insurance product (indexed vs. conventional) provides small farmers the best livelihood value: effective cost, coverage level, low basis risk, and ease of understanding

Empirical Strategy

- Apply a survey to a sample of insured farmers
  - 1,000 rice and maize farmers
- Carry out focus groups
- Three counties of study:
  - Two on the coast (Daule and El Empalme-Balzar)
  - One in the southern highlands (Celica-Pindal)
- Evaluate the functioning of the insurance contract subsidized by the government
- Measure production and evaluate indemnity payments with the shadow contract vs. the conventional contract

Preliminary results: functioning of conventional insurance

- There is a mixed acceptance of this insurance contract among farmers
  - 53% of farmers would have purchased the insurance if it wasn't mandatory
- Problems in the functioning of the system
  - Misunderstandings, lack of information
    - Role of the Government
    - Level of coverage
    - How to file a claim
    - How is loss determined
  - Coordination problems
    - Relationship BNF-Colonial-MAGAP, which is the role of each institution?
    - Problems in the line of communication between BNF – Colonial
  - Timing
    - Loan approval by the BNF
    - Coordination of visits to the parcels
    - Indemnity payments

Preliminary results - Survey

Percentage of Farmers who Filed a Claim (out of those who had low yields)

	Celica	El Empalme	Daule	All
Humid season				
% who sowed	100%	100%	43%	81%
% low yields	91%	65%	18%	67%
% who filed a claim	***98%***	***89%***	***4%***	***90%***
Dry season				
% who sowed	1%	17%	99%	39%
% low yields	0%	23%	24%	23%
% who filed a claim	***-***	***0%***	***20%***	***17%***

Preliminary results - Survey

For those who Filed a Claim in the Humid Season…

Did you receive an indemnity payment?	Celica (N=335)	El Empalme (N=194)	Daule (N=1)	Todos (N=530)
Yes	**53%**	**45%**	**0%**	**50%**
Payment was as expected	6%	10%	-	7%
Payment was less than expected	94%	90%	-	93%
No	**47%**	**55%**	**100%**	**50%**
Not a covered loss	3%	1%	0%	2%
Claim out of time	1%	5%	0%	3%
Field unattended	1%	0%	0%	1%
Expecting a payment	80%	77%	100%	79%
Other reason	14%	17%	0%	15%

How many farmers received indemnity payments?

BANCO NACIONAL DE FOMENTO - CLIENTES CELICA Y PINDAL				
ESTABAN A LA ESPERA DE INDEMNIZACIÓN				
SEGÚN LA LISTA DE COLONIAL FUERON:	Indemnizados	No indemnizados	No aparecen en lista de Colonial	TOTAL
número	53	0	23	76
porcentaje	70%	0%	30%	100%

BANCO NACIONAL DE FOMENTO - CLIENTES EL EMPALME Y BALZAR				
ESTABAN A LA ESPERA DE INDEMNIZACIÓN				
SEGÚN LA LISTA DE COLONIAL FUERON:	Indemnizados	No indemnizados	No aparecen en lista de Colonial	TOTAL
número	20	25	37	82
porcentaje	24%	30%	45%	100%

BANCO DE LOJA - CLIENTES CELICA Y PINDAL				
ESTABAN A LA ESPERA DE INDEMNIZACIÓN				
SEGÚN LA LISTA DE COLONIAL FUERON:	Indemnizados	No indemnizados	No aparecen en lista de Colonial	TOTAL
número	39	1	10	50
porcentaje	78%	2%	20%	80%

BANCO NACIONAL DE FOMENTO - CLIENTES DAULE				
ESTABAN A LA ESPERA DE INDEMNIZACIÓN				
SEGÚN LA LISTA DE COLONIAL FUERON:	Indemnizados	No indemnizados	No aparecen en lista de Colonial	TOTAL
número	2	6	1	9
porcentaje	22%	67%	11%	100%

Preliminary results: functioning of conventional insurance

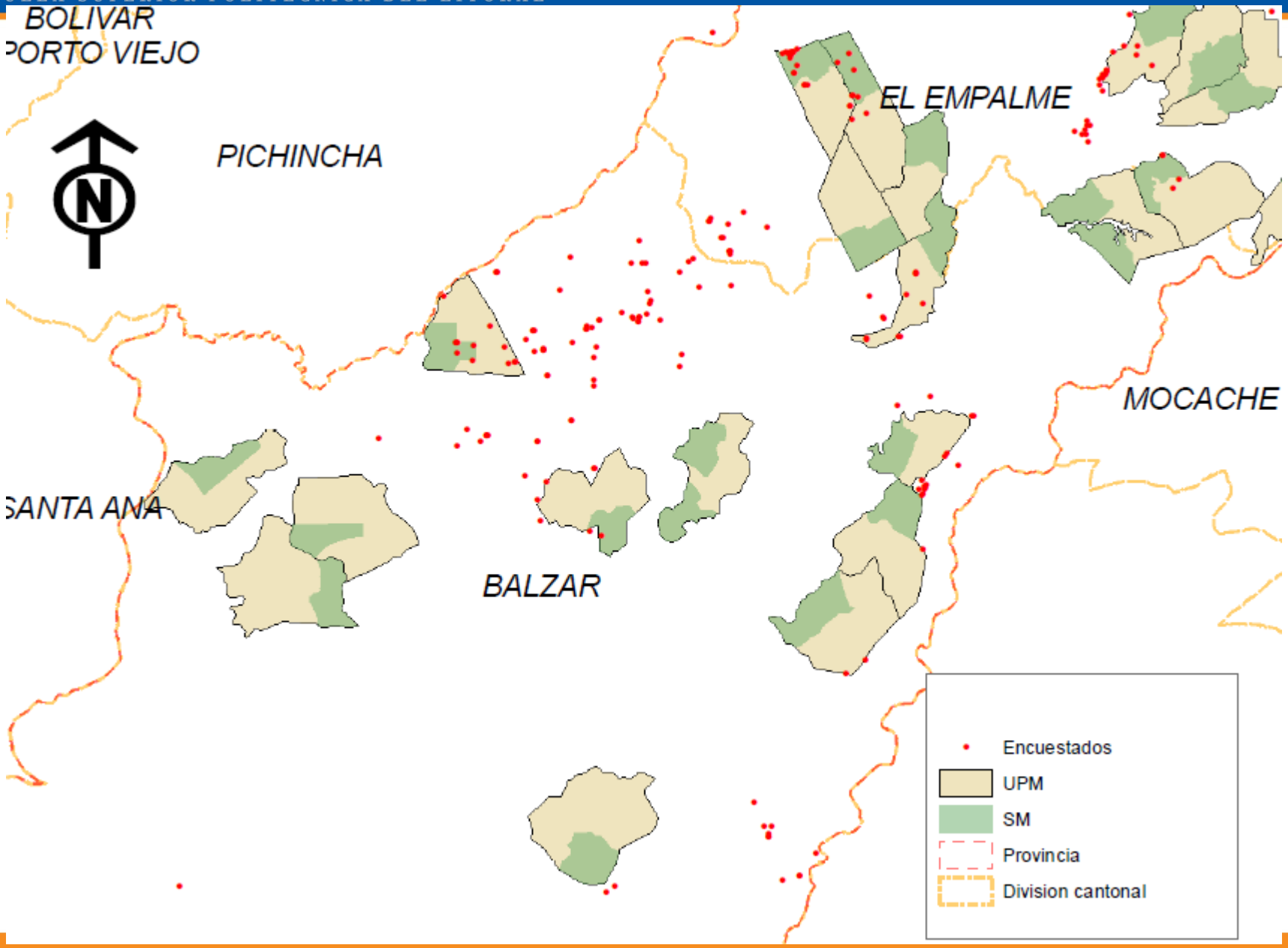
- There is "Basis Risk"
  - When farmers do not report the claim at all or do not report it in time;
  - When their claim is not processed in a timely manner, hence forcing farmers to go back to the use of inefficient ex-post risk coping strategies;
  - When they are not able to document that the loss was beyond their control
- AgroSeguro is an innovative insurance program in Ecuador and is progressing in the learning curve but…
- In order to solve these problems, a larger investment is needed…is it worth it?

Will I be paid after a loss?

- Empirical objective:
  - to determine if farmers would have been paid under a shadow area-yield index insurance contract
  - compare this with payments under the conventional contract
- Data for the comparison
  - ESPAC 2002-2009 for historic mean yield
  - ESPAC 2010 (ESPAC 2011 is not yet released)
  - Data base from project's survey: farmers who were insured in year 2010
- Area for the comparison: El Empalme-Balzar
- Coverage area: the UPM
- Downside of the analysis: not very many of the farmers insured in 2011 were also insured in 2010

Sampling Strategy of ESPAC

- Every county is divided into ***Strata***: homogeneous areas according to main crop (pasture, annual crops, permanent crops,..)
- Every Strata is divided into ***Unidades Primarias de Muestreo*** (UPM): areas of 10 km^2 (1.000 ha.);
- Every UPM is divided into ***Segmentos de Muestreo*** (SM): areas of approximately 200 – 500 ha.
- All farmers (***Unidades de Producción Agropecuaria***, UPAs) inside each Segment are included in the survey
- There is a panel data of SMs since 2002

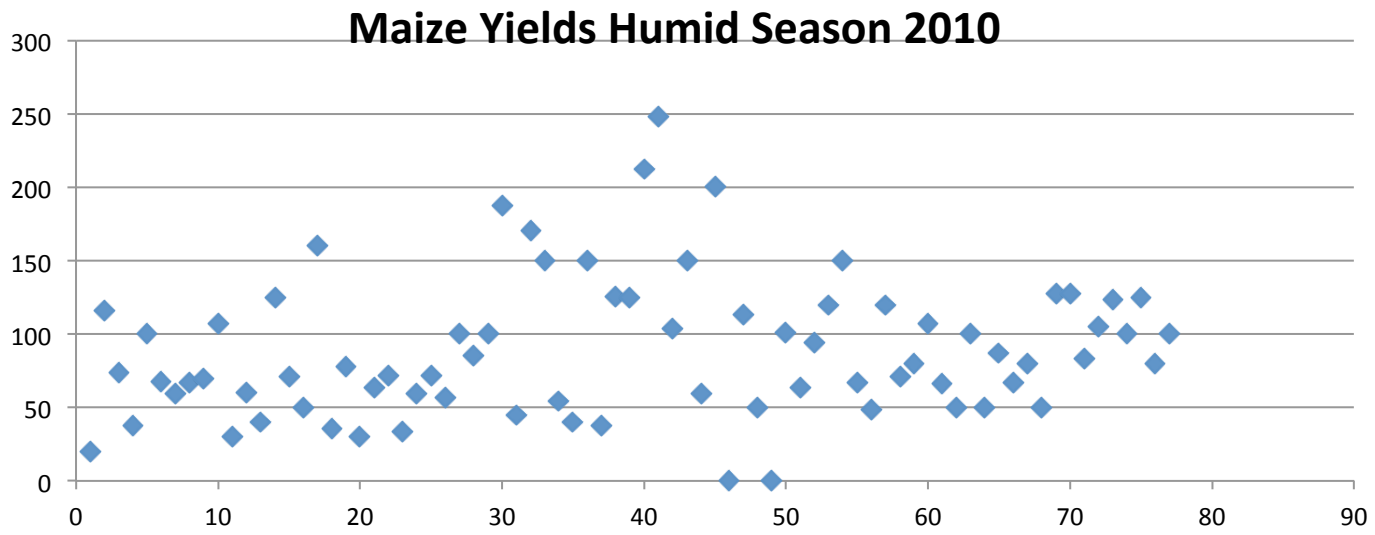

BOLIVAR
PORTO VIEJO
PICHINCHA
EL EMPALME
MOCACHE
SANTA ANA
BALZAR
N
Encuestados
UPM
SM
Provincia
Division cantonal

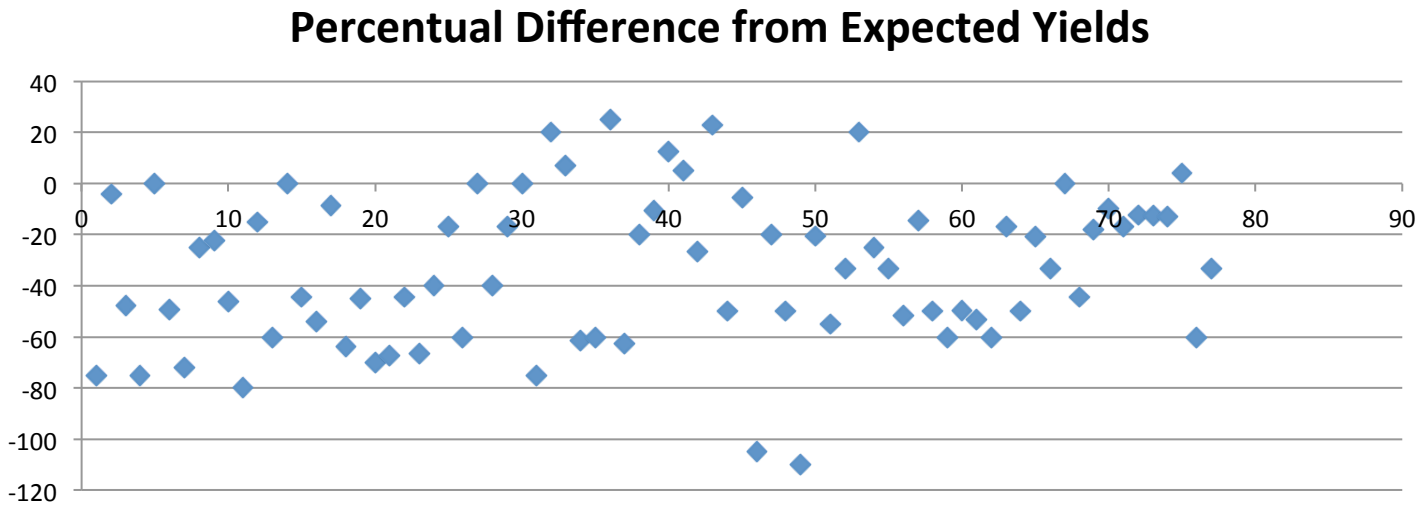
Empirical Strategy

- Choose UPM with largest number of farmers in our survey: UPM 126
- Choose UPMs close to UPM 126 in order to form a cluster: UPMs: 126, 152 and 141

Insured farmers in 2010

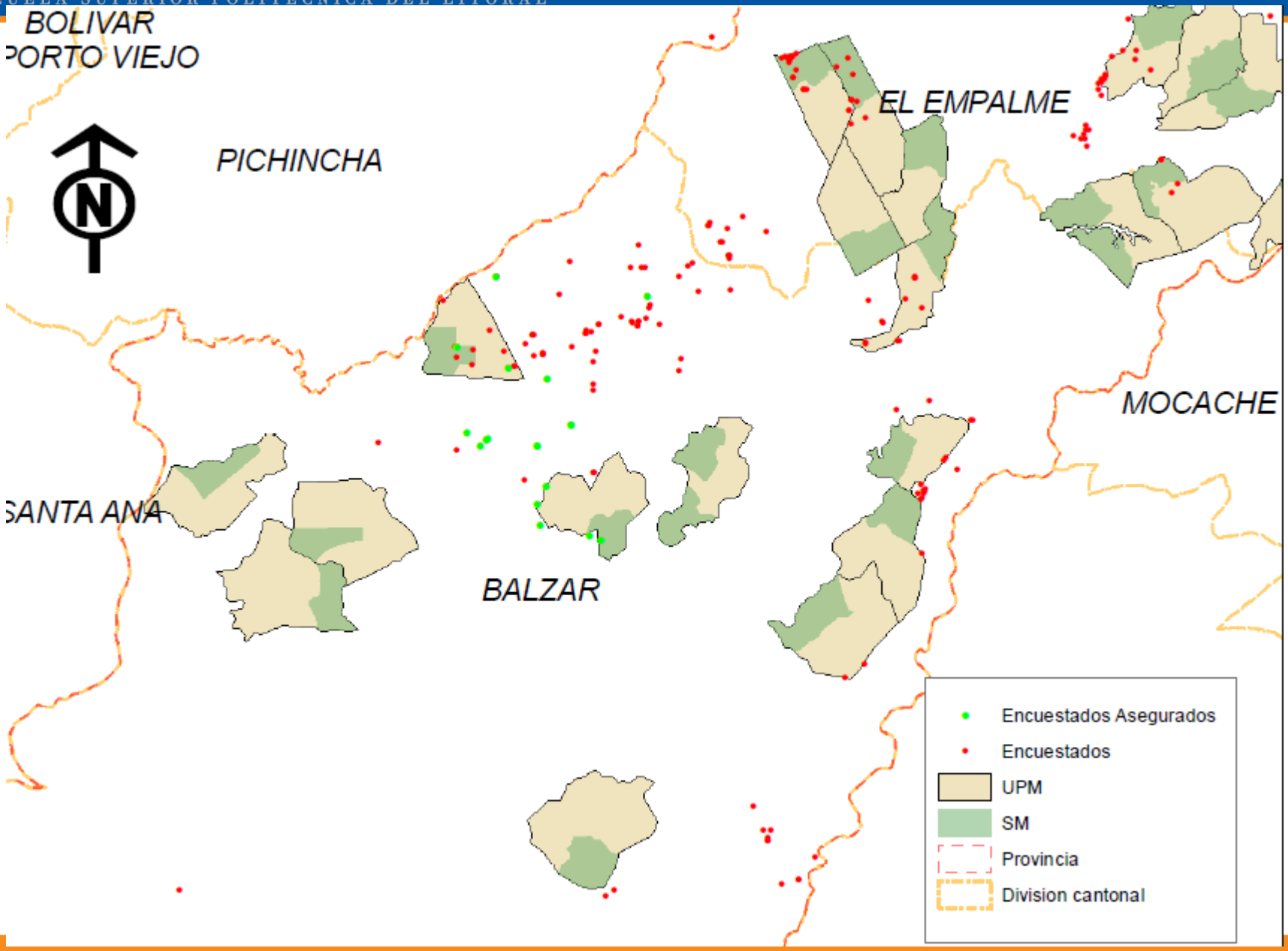
	Closest UPM			
In our data base	**126**	**152**	**141**	**cluster**
total farmers	52	12	13	77
average yields (qq/ha)	87	87	97	88

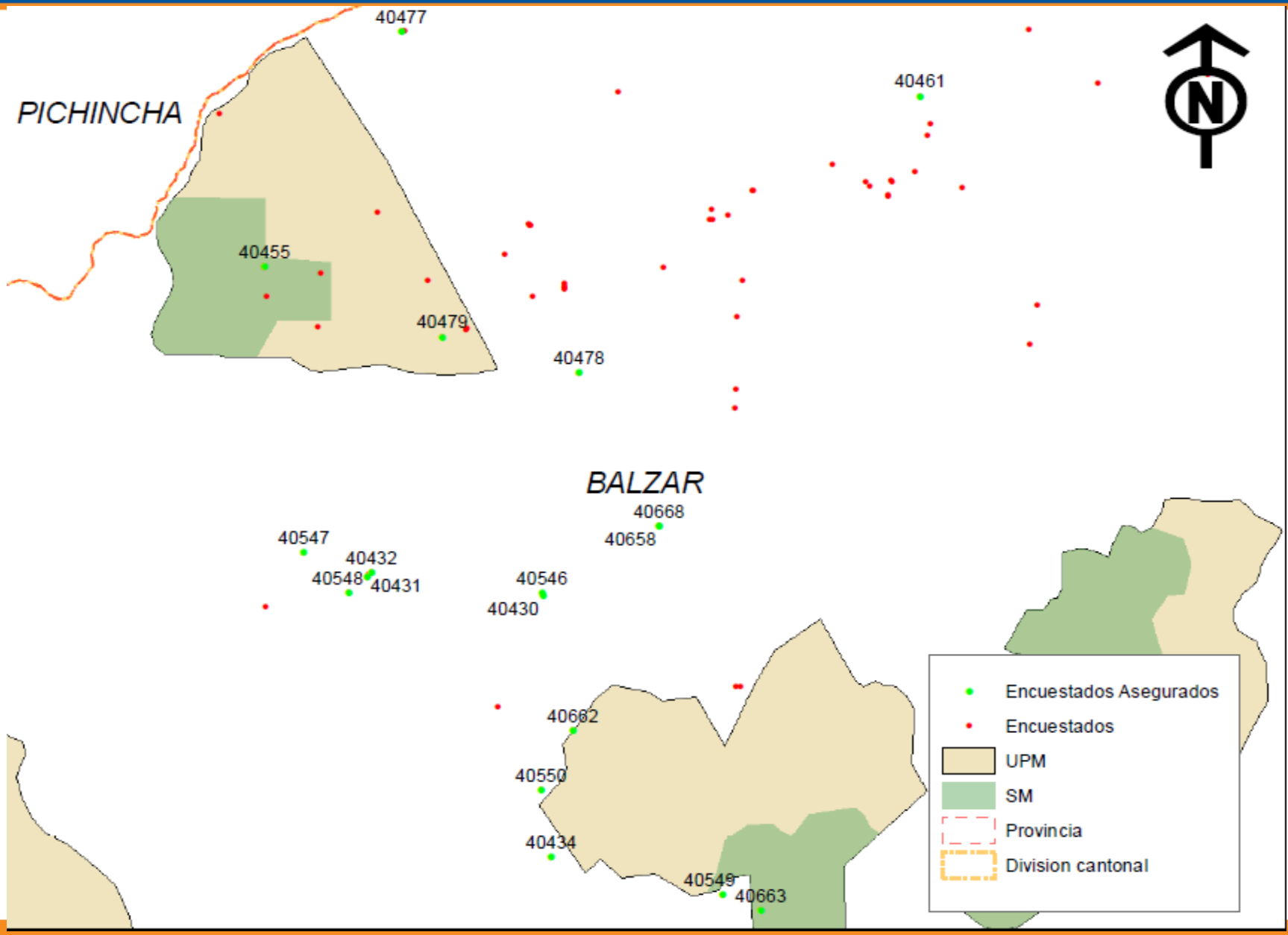

Maize Yields Humid Season 2010
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90

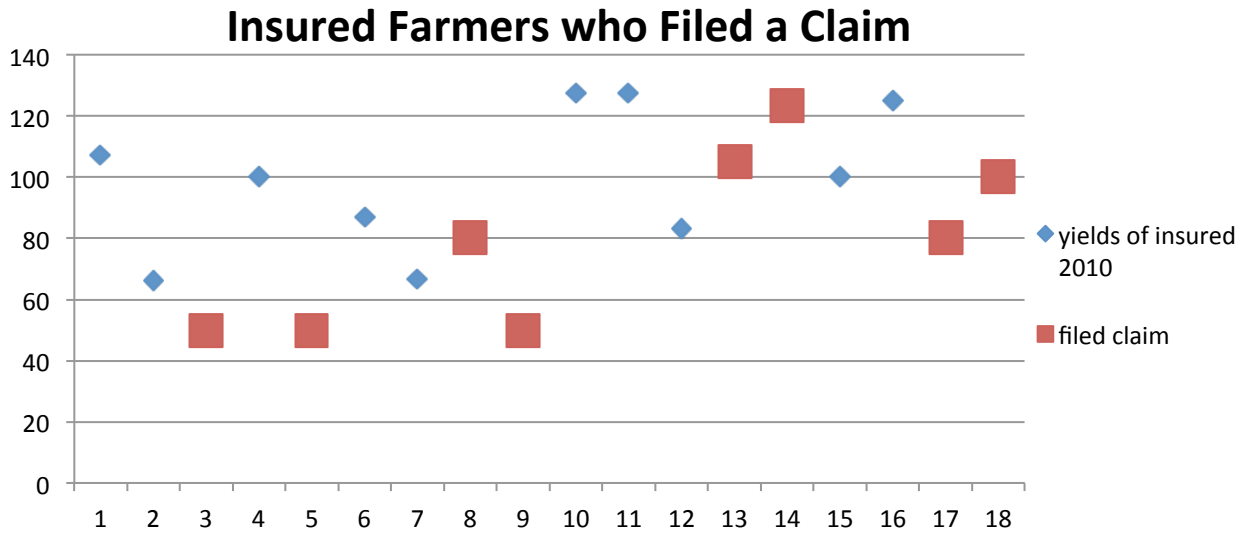

Percentual Difference from Expected Yields
40
20
0
-20
-40
-60
-80
-100
-120
0
10
20
30
40
50
60
70
80
90

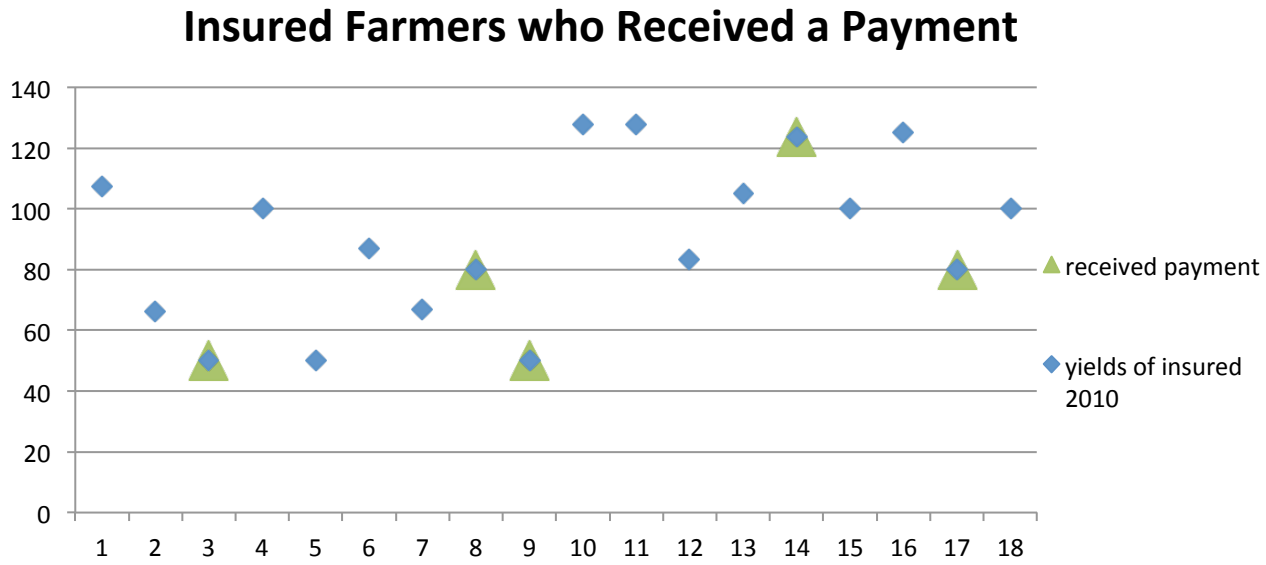
Insured farmers in 2010

	Closest UPM			
In our data base	**126**	**152**	**141**	**cluster**
total farmers	52	12	13	77
insured farmers	8	9	1	18
filed claim	4	4	0	8
received payment	2	3	0	5


BOLIVAR
PORTO VIEJO
PICHINCHA
EL EMPALME
MOCACHE
SANTA ANA
BALZAR
N
Encuestados Asegurados
Encuestados
UPM
SM
Provincia
Division cantonal


PICHINCHA
BALZAR
40477
40461
40455
40479
40478
40547
40432
40548
40431
40546
40430
40668
40658
40662
40550
40434
40549
40663
N
Encuestados Asegurados
Encuestados
UPM
SM
Provincia
Division cantonal

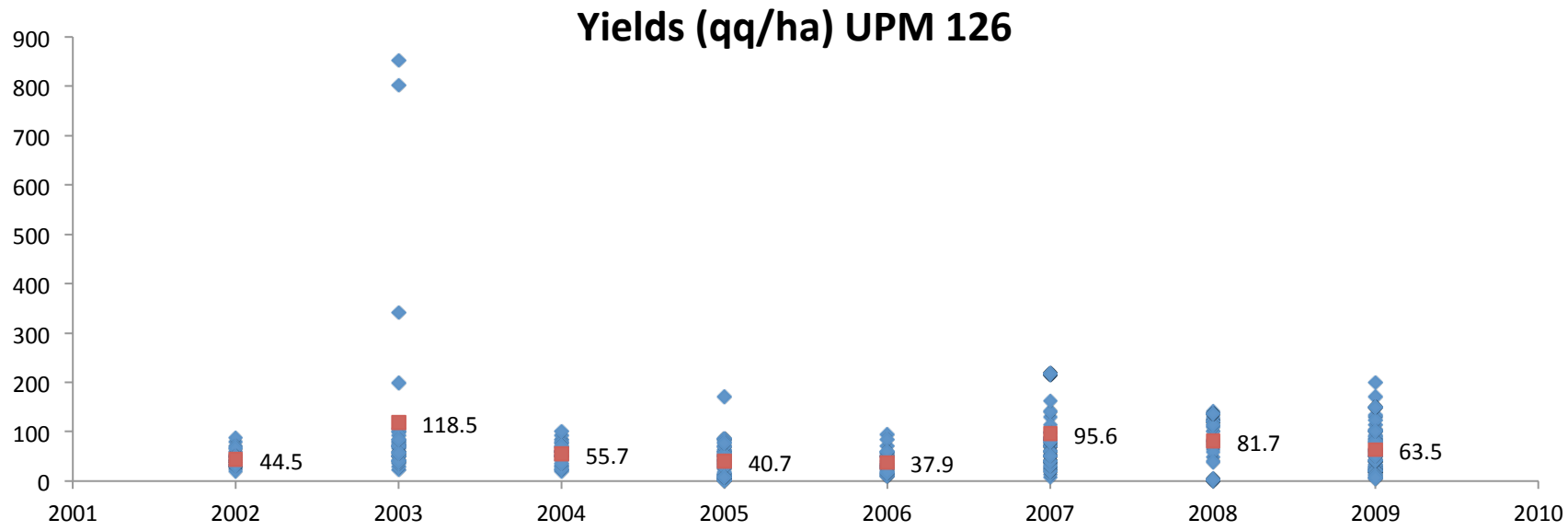

Insured Farmers who Filed a Claim
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
yields of insured 2010
filed claim

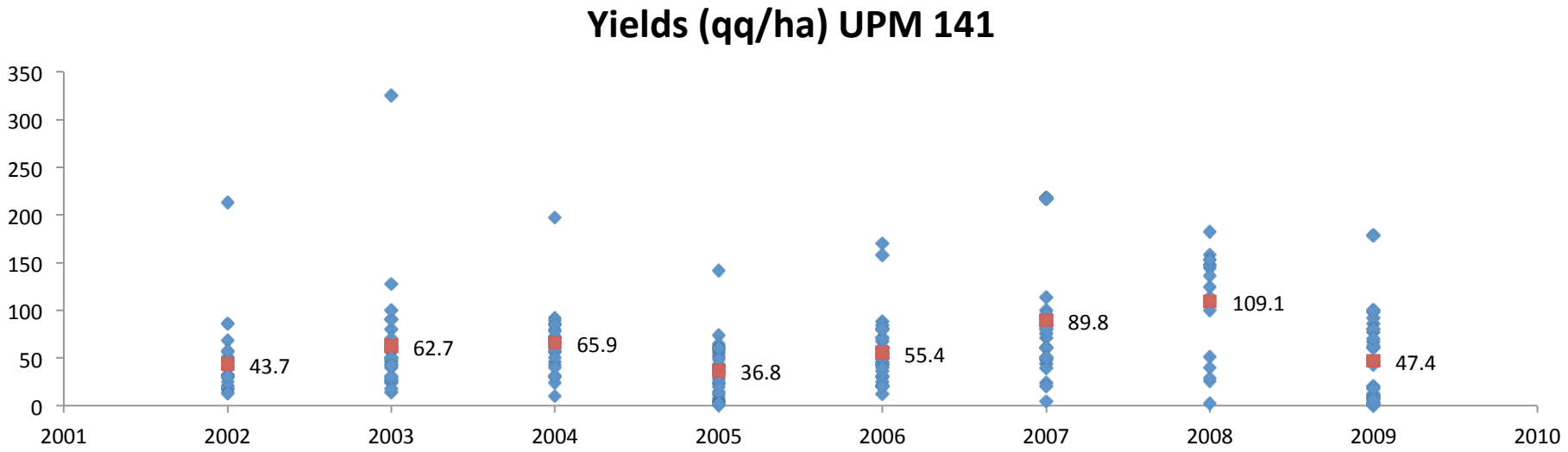

Insured Farmers who Received a Payment
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
received payment
yields of insured 2010

Payment under Index Insurance?

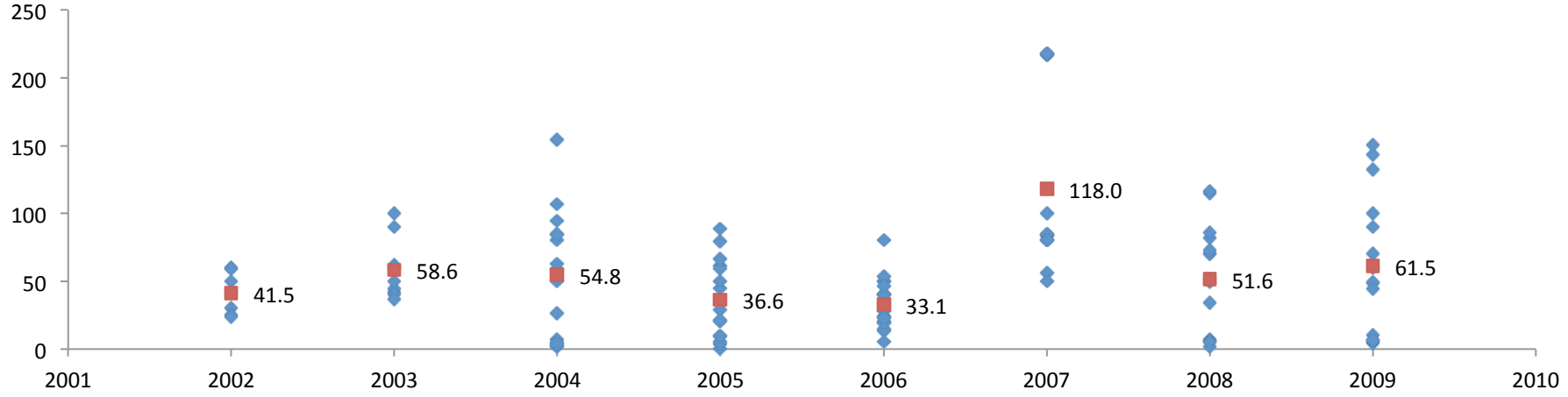
	Closest UPM			
	126	**152**	**141**	**together**
Historic mean yield	74	61	63	69
Value of 60% trigger	44	37	38	41
Value of 75% trigger	56	46	47	52
2010 mean yield	53	39	42	48
Payout with 60% trigger?	NO	NO	NO	NO
Payout with 75% trigger?	YES	YES	YES	YES

- Reasons for choosing a 75% trigger point:
  - ESPAC mean yield includes marginal farmers (use lower technology and therefore obtain lower yields)
  - Insured farmers through the BNF must apply better technology and therefore have larger production costs…hence they need between 80 and 100 qq/ha. in order to recover their investment

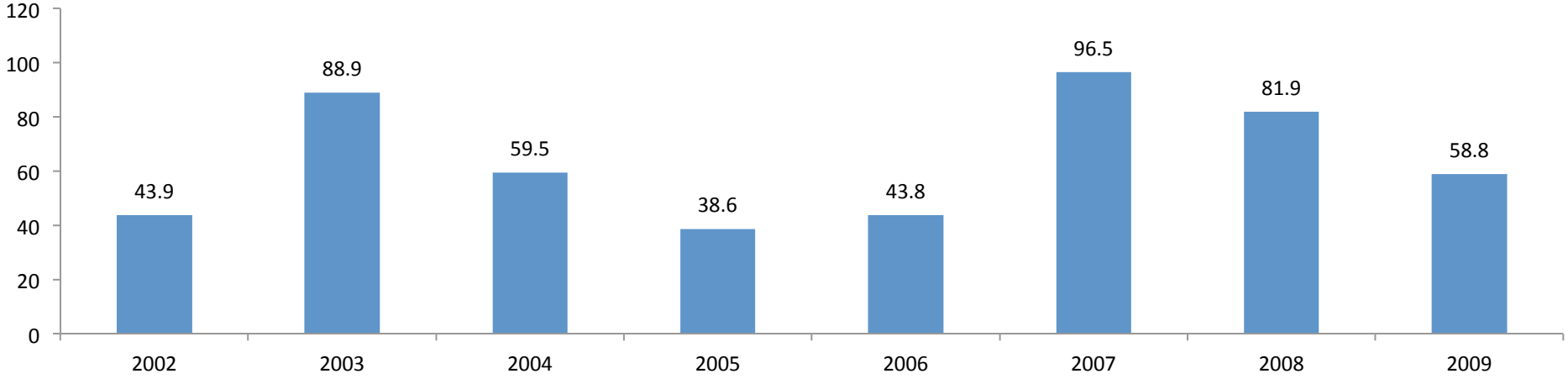

Yields (qq/ha) UPM 126
900
800
700
600
500
400
300
200
100
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
44.5
118.5
55.7
40.7
37.9
95.6
81.7
63.5

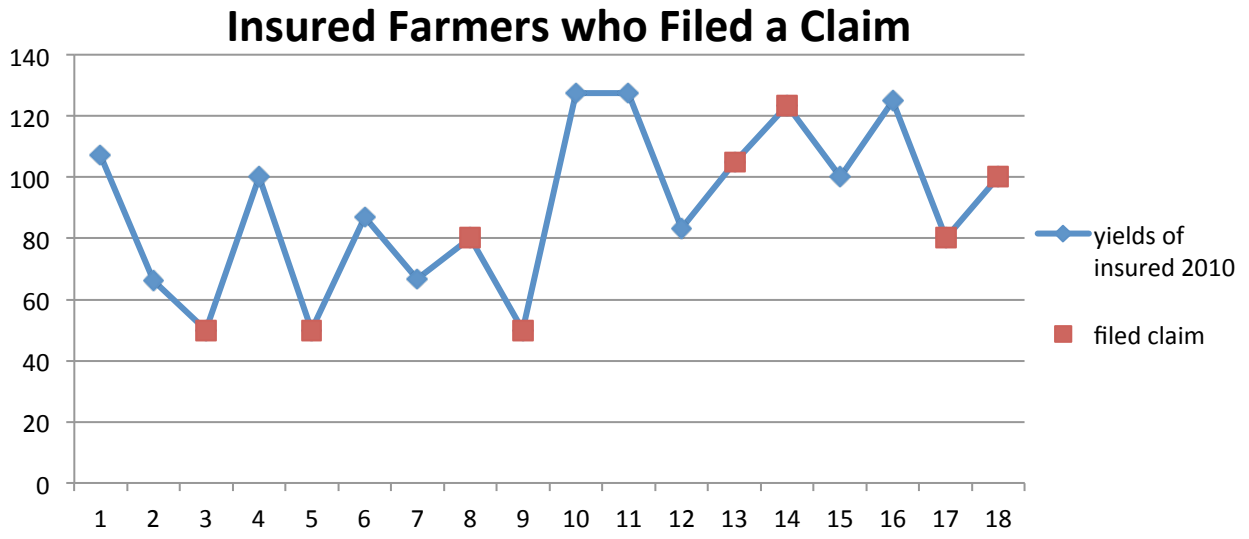

Yields (qq/ha) UPM 141
350
300
250
200
150
100
50
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
43.7
62.7
65.9
36.8
55.4
89.8
109.1
47.4

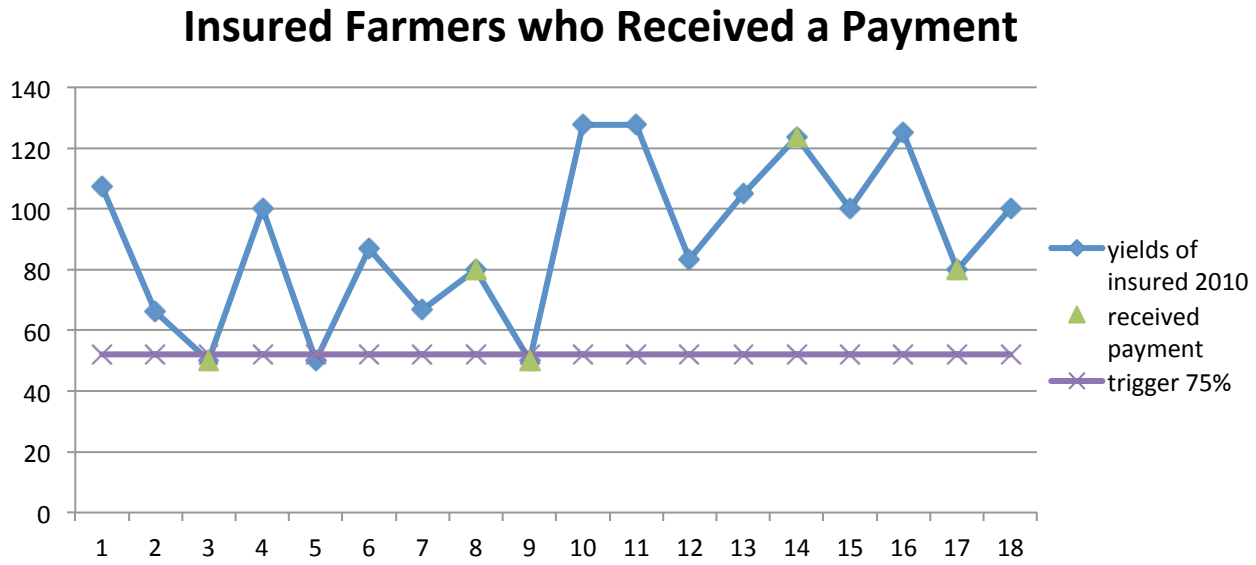
Yields (qq/ha) UPM 152



Yields (qq/ha) UPMs 126, 152 and 141




Insured Farmers who Filed a Claim
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
yields of insured 2010
filed claim


Insured Farmers who Received a Payment
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
yields of insured 2010
received payment
trigger 75%

Results from Comparison

- Given 2010's average yield in the covered area, under index insurance (with a 75% trigger point) all insured farmers would have been paid.
- If the trigger point would have been 60% of average historic yield no payment would have occurred

Results from Comparison

- Under conventional insurance:
  - 44% of insured farmers filed a claim
  - It is likely that other insured farmers had a legitimate loss and therefore should have filed a claim but didn't…
    - because of little knowledge about the functioning of the contract, or
    - because of high transaction costs
  - 28% of insured farmers received payment
    - That is 63% of those farmers who filed a claim

Conclusions

- Using 2010 data and the case of 18 insured farmers in El Empalme-Balzar we see that all insured would have been paid with an index insurance contract
- Still waiting for Government's ESPAC 2011 data to carry out full comparative analysis.

Thank you