Farmers' practices in using cotton varieties and seeds in a liberalized market:

A case in Hebei Province (China)

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Issues addressed

- What's the status of the market of cotton varieties and seeds
  - How liberalized this market is?
- What's the share of Bt varieties?
- How do farmers react towards this market?
- to farmers, how profitable the current market is?

The case addressed

- Hebei Province
  - First place for Monsanto's varieties in 1997
    - Some delay in facing competition by varieties with Chinese Bt genes
- Results of 4 years of survey
  - Covering in total 861 farmers of 36 different villages
  - Surveys by ag. Students, bypassing local extension officers

Plenty of varieties being used

	2006	2007	2008	2009
Nber producers	119	207	338	173
Average cotton area per farmer, ha	0.66 (0.37)	0.48 (0.39)	0.39 (0.27)	0.36 (0.74)
Nber varieties recorded	50	67	113	59

Small cotton farming

213 distinct varieties in 4 years

In 2009, only 9 out of 59 varieties were used 2 or 3 years earlier

Competition under some market concentration

Area shares of Top 5 and Top 10 varieties

	2006	2007	2008	2009
top 5	33.9	47.4	43.5	17.9
top 10	57.2	61.3	55.1	30.2

Mainly market for local and regional breeding org.

Distribution of varieties according to breeding origins (% total number of varieties)

	2006	2007	2008	2009	All years
Hebei province	52.9	61.4	53.3	48.8	54.3
Other Yellow River Valley Provinces	38.3	34.1	42.3	51.2	41.4
USA (Monsanto)	8.8	4.5	4.4	0.0	4.3

Bt widespread… but not generalized

Distribution of varieties according to varieties types (% total number of varieties)

	2006	2007	2008	2009	All years
% Bt-varieties, official record	55.9	65.9	73.3	82.9	70.1
% Bt-varieties, in reality	73.5	75.0	86.7	90.2	81.7
% Hybrid varieties	5.9	13.6	8.9	22.0	12,8

No longer so happy with Bt

Distribution of farms according to their perception of Bt varieties (% total number of farms)

	all varieties
unhappy with Bt-cotton effect	36.1
finding that profit was somehow disappointing	39.4
finding that profit was satisfactory	60.6
finding that Bt effect has decreased	31.0
finding that Bt profit has decreased	28.9

Something wrong with the names…

	2006	2007	2008	2009	All years
	Shares of total variety numbers				
variety with correct names	68.0	65.7	39.8	69.5	56.7
varieties with doubtful names	32.0	32.8	59.3	30.5	42.6
	Share of harvested areas				
variety with correct names	77.0	84.0	68.6	66.0	74.1
varieties with doubtful names	23.0	14.0	30.2	34.0	25.0

Even for tiny farms, more is better

	2006	2007	2008	2009	All years
Number of varieties by producer	1,8	1,6	1,5	1,5	1,5
% producers with one variety	46.2	48.3	61.8	68.8	57.7
% producers with two varieties	34.5	45.9	31.7	17.9	32.7
% producers with 3 or more varieties	19.3	5.8	6.5	13.3	9.6

Unconscious use of uncertain varieties?

Probably unconsicous: when using several varieties, there were seldom farmers using exclusively varieties of uncertain names

	Number of varieties used		
	1	2	3 +
Number of farms concerned	478	273	79
% farms with only varieties of correct names	74.7	63.0	45.6
% farms with only varieties of doubtful names	25.3	7.7	2.5
% farms with varieties of both types	0	29.3	51.9

Unhappy with seeds

…both with regard to price and quality

<	varieties names were		all varieties
	correct	doubtful	
Number answers	800	252	1052
% farms unhappy with seed price	62.3	61.5	62.3
% farms unhappy with seed quality	46.8	30.6	43.3

Seeds: no part of strategy of minimising cost

No difference in seed price for both type of varieties…

	Farms using varieties whose names were	
	correct	Doubtful
seed annual renewal (% all cotton plots)	66.9	58.8
seed purchased with merchants (% of the related cotton plots)	80.9	86.1
Total input cost, US$/ha	703 (150)	724 (171)
seed cost, US$/ha	84 (53)	89 (67)
fertilizer cost, US$/ha	290 (99)	309 (125)
pest control cost, US$/ha	173 (76)	159 (78)
disease control cost, US$/ha	22 (28)	31 (38)
other cost, US$/ha	105 (30)	114 (37)
Yield, seedcotton kg/ha	3797 (779)	3794 (917)

…and no systematic difference in various input costs

Amazing impact of seeds on yield

Variables with significant effects on seedcotton yield

Number varieties	+
cotton area	-
irrigation cost	+
seed cost	-
disease control cost	+
Seed bought from distributors	-

In short

- Market is liberalized
  - Competition is tight…
  - …but no so much fair because of doubtful varieties
- Seed price is getting high
  - And not really indicator of seed quality and condition for better yield
- Farmers not very happy with seed price and quality
  - Using more varieties even on tiny cotton areas = a way to reduce the effect of uncertainty of varieties?
- Some control and regulation is needed!