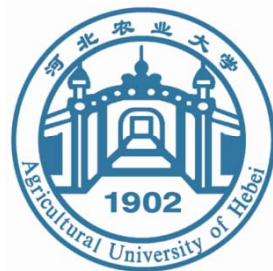


Status and Factors of Transgenic Cotton Coexistence in Hebei Province (China)

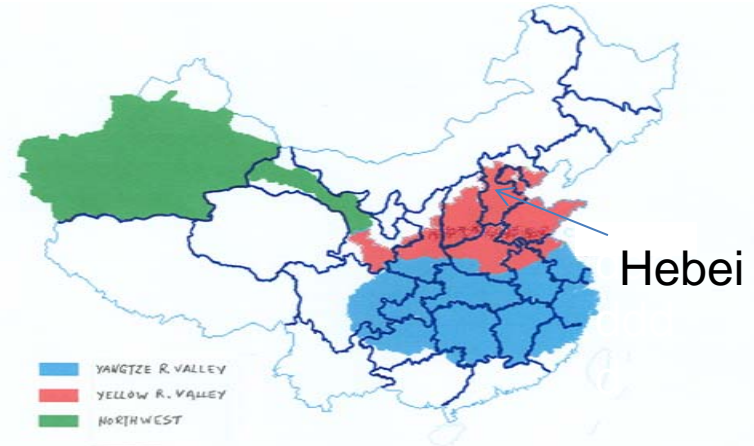


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The case addressed

- 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



Our points

- No more generalized planting of Bt-cotton
 - Some move back to conventional cotton
 - \Rightarrow coexistence ?
- Factors are :
 - Messy variety market
 - Less advantages of Bt cotton

Plenty of varieties being used

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

Notes: figures based on varieties with verified names

Small cotton farming

213 distinct varieties in 4 years

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



Variety market quite messy

	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

In terms of areas occupied, doubtful varieties represented 25%

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

Notes: figures based on varieties with verified names

Status of "coexistence"

All years	
Only one variety on farms	
Number of farms	349
% of farms where variety is of Bt type	83.7
% of farms where variety is of non-Bt type	16.3
More than one variety on farms	
Number of farms	328
% of farms where varieties are of only Bt type	69.8
% of farms where varieties are of only non-Bt type	7.3
% of farms where varieties are of both types	22.9

Calculations based on varieties with verified names

The move back to conventional cotton probably under-estimated if the ratio of conventional cotton is higher among doubtful varieties

Factor : market messiness

- \Rightarrow return to conventional cotton
 - Unconsciously
 - Getting non-Bt varieties unwillingly
 - Or consciously
 - Rationale to use more varieties, including non-Bt ones

Factor : trouble with seeds

...both with regard to price and quality

% farms unhappy with seed price	62.3
% farms unhappy with seed quality	43.3

Factor : Habit or adaptation strategy

using multiple varieties...even on tiny farms

	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

Factor : reduction of Bt advantage

Less positive perception of Bt cotton

Farms...	% of all farms
unhappy with Bt-cotton effect	36.1
finding that profit was somehow disappointing	39.4
finding that Bt effect has decreased	31.0
finding that Bt profit has decreased	28.9

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

Factor : reduction of Bt advantage

No clear economic advantage

Seed use practices, production costs and yield	Farmers with Bt varieties	Farmers with Non-Bt varieties
Number of farms	596	156
Total production input cost, \$/ha	702	713
Seed cost, \$/ha **	86	62
Fertilizer cost, \$/ha *	287	307
Pest control cost, \$/ha **	170	191
Yield, kg/ha seedcotton	3790	3891
Gross income	1890	1921

In China, coexistence is particular

- In China, no debate on coexistence
- Debate soon?
 - No more generalized use of GM cotton
 - Current situation = narrow meaning of coexistence
 - Non-GM cotton are grown along GM cotton
 - Debate from claim for Non-GM cotton
 - If GM cotton keeps on losing specific advantage

Factors and solution

- 2 interrelated factors
 - A matter of messy market and adaptation to
 - A matter of reduction of Bt cotton advantage
- Regulation is needed
 - Secure certainty of variety nature
 - ...and the right to move back to conventional cotton
- More is at stake than coexistence
 - Clean the variety market = a condition to preserve varietal progress