

UBS Investment Research

US Agricultural Chemicals

EPA Approves 5% Refuge For *SmartStax*

■ EPA approval paves the way for a 2010 commercial launch

The EPA approved a reduction in the corn rootworm (CRW) refuge requirement from 20% to 5% in the Corn Belt for *SmartStax* brand biotech corn, jointly developed by Monsanto and Dow AgroSciences. *SmartStax* had previously received similar approval for control of European corn borer, an above-ground insect. MON and Dow will have 3-4 million acres of *SmartStax* available in 2010.

■ Refuge reduction introduces a “whole farm” yield advantage for *SmartStax*

The EPA-mandated maintenance of a refuge for insect resistance management creates a yield burden for growers who are restricted from planting the higher-yielding CRW-protected corn on 20% of their land. Monsanto calculates a 5-10% yield advantage for *SmartStax* versus existing triple-stack corn. In high-yielding corn environments (200+bu/acre), this creates \$40-\$80/acre of value.

■ *AcreMax I* unlikely to receive below-ground refuge of less than 10%

The EPA staff indicated in February 2009 that based on Pioneer’s data submission for its *SmartStax* competing product *AcreMax I* it felt that a refuge reduction to 10% would be a viable option to control CRW. Pioneer has submitted additional data to the EPA and agreed to an extension of the June 12 EPA decision date.

■ *SmartStax* approval could derail Pioneer’s renewed competitive strength

Even if *AcreMax I* receives a 5% below-ground refuge, it lacks similar above-ground refuge reduction and its desirable refuge-in-a-bag feature will be matched by MON by 2011. Without a sizable reduction in the 2008 yield gap of 9 bu/acre with MON, Pioneer will likely have difficulty sustaining share gains in 2010.

Table 1: Status of Refuge Adjustments for Monsanto and Pioneer Products

	Above-Ground Reduced Refuge	Below-Ground Reduced Refuge	Refuge-in-a-Bag Concept
<u>Monsanto</u> <i>SmartStax</i>	5% - Approved	5% Approval July 2009	Possible by 2011
<u>Pioneer Hi-Bred</u> <i>AcreMax I</i>	<i>AcreMax II</i> only Currently Planned	EPA Approval Pending-Likely 10%	Approval Pending Likely 2010

Source: Company reports and UBS estimates for 2012

20 July 2009

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Key Investment Points

EPA approval of 5% refuge for *SmartStax* paves the way for a 2010 commercial launch. On Monday, July 20, the EPA approved a reduction in the refuge requirement for corn rootworm (CRW), a below ground insect, from 20% to 5% in the Corn Belt for *SmartStax* brand biotech corn. *SmartStax* is a result of a cross-licensing and R&D collaboration between Monsanto and Dow AgroSciences. *SmartStax* had previously received a similar refuge acreage approval for control of European corn borer (ECB), an above-ground insect. Monsanto and Dow Agrosciences will have 3-4 million acres of *SmartStax* available in 2010.

Refuge reduction creates a yield advantage for growers. The EPA-mandated maintenance of a refuge for insect resistance management creates a yield burden for growers who are restricted from planting the higher-yielding CRW-protected corn on 20% or more of their land. Monsanto calculates a 5%-10% yield advantage for *SmartStax* versus existing triple-stack corn. In high-yielding corn environments (200+bu/acre), we calculate this creates \$40-\$80/acre of value. MON has typically priced its traits to capture 33% to 50% of the value created for growers, which would suggest a \$13-\$40/acre *SmartStax* trait price premium to existing triple-stack offerings.

We judge Pioneer *AcreMax I* is unlikely to receive below-ground refuge of less than 10%. The EPA staff indicated in February 2009 that based on Pioneer's data submission for its *SmartStax* competing product *AcreMax I* it felt that a refuge reduction to 10% would be a viable option to control CRW. Unlike *SmartStax*, which has two modes of action for control of CRW, *AcreMax Cry34/35Ab1* has a single mode of action, but Pioneer has argued that since it is a repelling, not a toxic, mechanism, there is an extremely low risk (10^{-14}) of resistance. The EPA scientific advisory panel did not agree, but Pioneer has submitted additional data to the EPA and agreed to an extension of the June 12 2009 EPA decision date.

***SmartStax* approval could derail Pioneer's renewed competitive strength.** Pioneer has gained share this year in U.S. corn seed for the first time in eight years. Even in the unlikely case *AcreMax I* receives a 5% below-ground refuge, it lacks similar above-ground refuge reduction, and its desirable refuge-in-a-bag feature will be matched by MON by 2011. Without a sizable reduction this year in the 2008 yield gap of approximately 9 bushels per acre with MON, Pioneer will likely have difficulty sustaining share gains in 2010.

Monsanto's *SmartStax* Promises to Ratchet Up Competitive Pressures for Seed Makers post-F2010

Tracking the inevitable cyclical decline in Monsanto's Roundup margins and the increase in its branded corn seed share are key short-term markers for investors. Sustained competitive advantage and stock out-performance, however, reside in Monsanto's proven ability to develop and commercialize next-generation products. We believe the company again is poised to out-execute the competition. Most significantly, we assess its commercial launches in 2010 for both Roundup Ready 2 Yield (RR2Y) soybeans and *SmartStax* corn will come one-three years ahead of rival offerings by Pioneer Hi-Bred.

Refuge Reduction is an emerging point of differentiation for seed makers.

Trait penetration for insect resistance in corn is approaching threshold levels where adherence to requirements to segregate acres that are planted only with lower-yielding non-GM seeds (i.e., refuge acreage) is drawing increased regulatory attention. Seed makers offering products that possess either lower refuge acreage requirements or allow it to forego segregating his refuge acres carry the potential for a grower to achieve larger harvests at lower costs while addressing regulatory concerns. We estimate a 15 percentage point reduction in refuge acreage (5% set-aside requirement versus 20% set-aside currently) that can instead be used to achieve a 40%-50% increase in corn yields (e.g. ~200 bushels per new biotech acre versus ~140 bushels per old non-GM acre) would boost overall (“whole-farm”) yields by 4.8% per acre (197 bushels per acre average versus 188 bushels per acre average).

Table 2: Hypothetical Whole Farm Advantage Versus Current Triple-Stack From Lower Refuge Acreage Requirement

	<i>SmartStax</i> 5% Refuge	VT Triple 20% Refuge
<i>SmartStax</i> Acreage yield per acre (Estimated)	200	200
% of Acres	95%	80%
Non- <i>SmartStax</i> Acreage Yield per acre (Estimated)	140	140
% of Acres	5%	20%
Whole Farm Average Yield (bu/acre)	197	188
Whole Farm Advantage (%)	4.8%	

Source: UBS estimates

Monsanto appears ahead on refuge reduction, while Pioneer appears to be first to market with the refuge-in-a-bag.

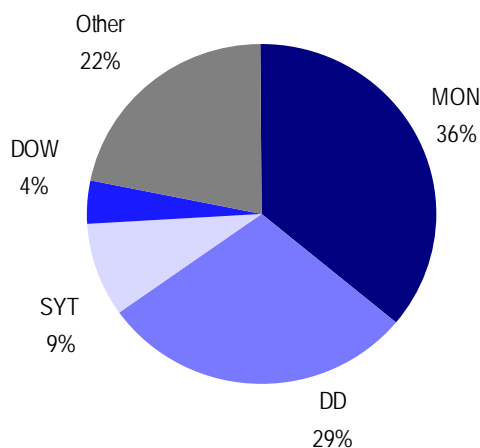
The table above summarizes the current regulatory status for key Monsanto and Pioneer products. We continue to expect the EPA to approve Monsanto’s request for a 5% rootworm refuge for *SmartStax* corn in time for sale in 2010. Our opinion is based upon the dual modes of action provided by its two separate corn rootworm traits. Pioneer’s competing *AcreMax I* offering is unlikely to receive a below-ground refuge requirement of less than 10%. *AcreMax I* does not possess a reduced above-ground refuge feature like *SmartStax*; However, Pioneer has an *AcreMax II* product possessing a second mode of action under development with a potential launch date of 2012.

AcreMax I will have a one-year lead for the desirable refuge-in-a-bag feature. We believe that limited introductory volumes of *SmartStax* in 2010 will not drive major market share shifts but could be a significant factor in 2011 and beyond.

Duopoly in U.S. corn seed takes clearer shape. Pioneer’s strong rebound in 2009 and expected share gains of 2%-3% points emphasize the consolidation at the top of the U.S. corn seed market. We estimate that combined market share for Pioneer and Monsanto brands (including its ASI unit) could reach 70% in 2009, with further gains highly likely in 2010-11. In soybeans, we believe market shares held by the top three producers (DuPont, Monsanto, and Syngenta) also approximate 70%. We believe this increasingly reflects a competitive environment where commercial success requires advanced skills in both conventional breeding techniques as well as in biotech development, as well as a well-developed distribution channel that affords broad market access.

Between 2010 and 2012, we expect MON to fully convert its U.S. soy and corn platforms to significantly higher priced second-generation offerings

Chart 1: Corn Seed: U.S. Market Share by Acreage in 2008



Source: Company reports and UBS estimates

Industry concentration at these levels increasingly leads us to the conclusion that future share gains for one of the “big two” corn seed makers must come at the expense of the other.

■ **Statement of Risk**

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UBS 12-Month Rating	Rating Category	Coverage ¹	IB Services ²
Buy	Buy	44%	38%
Neutral	Hold/Neutral	39%	36%
Sell	Sell	17%	25%
UBS Short-Term Rating	Rating Category	Coverage ³	IB Services ⁴
Buy	Buy	less than 1%	33%
Sell	Sell	less than 1%	33%

1:Percentage of companies under coverage globally within the 12-month rating category.

2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.

3:Percentage of companies under coverage globally within the Short-Term rating category.

4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

Source: UBS. Rating allocations are as of 30 June 2009.

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UBS 12-Month Rating	Definition
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Buy	Buy: Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.
Sell	Sell: Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.

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UBS Securities LLC: Don Carson; David Silver; Arun Viswanathan, CFA; Philip Kirkman.

Company Disclosures

Company Name	Reuters	12-mo rating	Short-term rating	Price	Price date
Monsanto Co. ^{16, 22}	MON.N	Buy	N/A	US\$76.56	20 Jul 2009

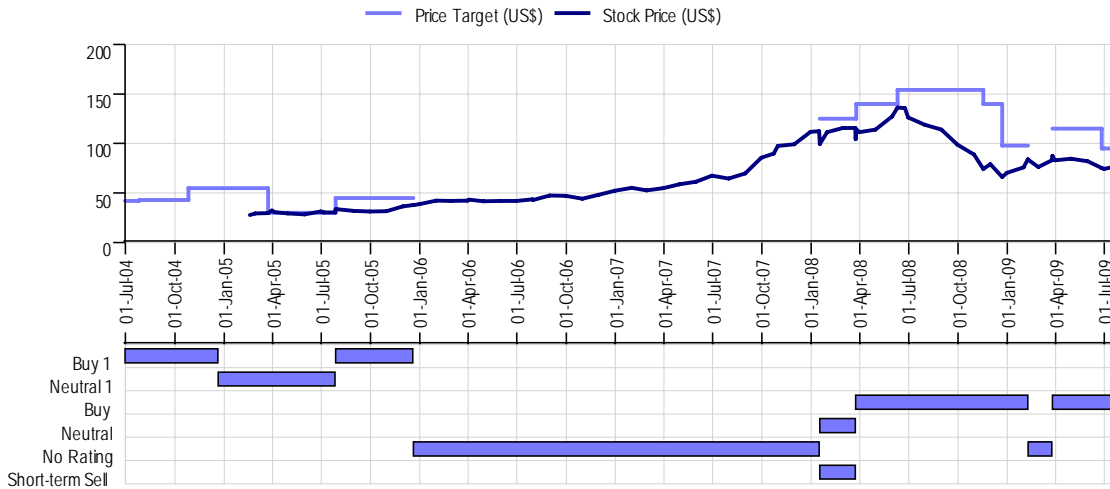
Source: UBS. All prices as of local market close.

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Monsanto Co. (US\$)



Source: UBS; as of 20 Jul 2009

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Additional Prices: E I du Pont de Nemours and Co, US\$28.33 (20 Jul 2009); Syngenta, CHF255.00 (20 Jul 2009); Source: UBS. All prices as of local market close.

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