

Why Companies Don't Pick Up New Strains ?

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Bt Subspecies & Strains: Commercial Introduction

Subspecies / Strains	Year	Current Owner	Major Products
Kurstaki / HD-1	70's, 80's	VBC	Dipel, BioBit
Kurstaki / SA-11	1982	Certis	Javelin, Delfin
Kurstaki / Transconjugant	1989	Certis	Condor, Foil
Kurstaki / in Pseudomonas	1990's	Dow	MVP, Match
Kurstaki / Recombinant	1990's	Certis	Crymax, Lepinox

Bt Subspecies & Strains: Commercial Introduction

Subspecies / Strains	Year	Current Owner	Major Product
Azawai	1995	VBC	XenTari, Florbac
Azawai / Transconjugant	1992	Certis	Agree, Turex
Tenebrionis	1983	VBC	Novodor
Israeliensis	1980's	VBC	VectoBac, Teknar
B. sphaericus	1996	VBC	Vectolex

Industry Requirements for Commercializing New Subspecies / Strains

- ◆ Significantly Better Than Current Subspecies / Strains in Regards to One or More of the Following:
 - Quantities of Delta – Endotoxin
 - Host range & Efficacy Vs. Major Economic Insects
 - Efficiency and Cost of Production and Formulation
- ◆ Return on Investment (ROI) Justification in Regards to:
 - Market Opportunities & Sale Projections
 - Registrations Cost
 - Intellectual Properties (Patents & Trademarks) Cost
 - Manufacturing (Including Formulation) Cost

Qualifying Bt Subspecies / Strains For Commercial Development: VBC Standard

◆ PHASE I (GO / NO GO Decision)

- Toxins Profile - LC 50 / Host Range - Speed of Kill
- Lab Process Development - Reproducibility / Plasmid Stability

◆ PHASE II (GO / NO GO Decision)

- Initial ROI Analysis - Greenhouse / Small Plot Field Trials
- Fermentation & Formulation Process Development

◆ PHASE III (GO / NO GO Decision)

- ROI Final Assessment - Field Development
- Large Scale Process Development - QA / QC

Bt Market Needs: Growers & Distributors Perspectives

- ◆ The Market is Satisfied With the Performance of Bt Products as Stand Alone or in IPM Programs
- ◆ Needs for “Faster Killing” Bt Products
- ◆ Needs for “Higher Efficacy” Against Mid – Late Instars
- ◆ Needs for “Longer Field Life” Bt Products
- ◆ Needs for “Rain-Fastness Tolerant” Bt Products

Bt Global Market: Steady Increase

Year	Sales Estimate (\$)	Reference
1995	\$125.40 MM	BCPC Publication
2000	\$144.50 MM	PJB Publication
2005	\$159.57 MM	CAB International Center

Why There is An Increase in Bt Market Penetration and Sales Volumes ?

- ◆ Advancement in Formulations
- ◆ Advancement in Product Quality
- ◆ Developing IPM / IRM Programs Based on Scientific Data

Bt Products Produce High Efficacy / Better Yield at the Right Price

- ◆ Government and Export Regulations
- ◆ IPM and Organic Farms

Bt Subspecies / Strains Future Research

- ◆ Bt japonensis for Scarabaeidea (Under Development)
- ◆ Industry Will Continue the Search for Novel Bt Subspecies / Strains as well as Novel Toxins
- ◆ In the Future, Industry May Allocate Resources for Developing Novel Bt Transconjugants
- ◆ For the Foreseeing Future, Most Likely the Industry Will Not Develop Other Recombinant Bt

Conclusions

- ◆ The Total Number of Subspecies / Strains (Including Transconjugants and Recombinants) that were Developed for Commercial Products Exceeded 14 from 1970 to 2007. Good Achievement When Considering the Cost Associated With Developing Commercial Products
- ◆ Industry Will Continue the Search for Novel Bt Subspecies / Strains and Novel Toxins
- ◆ Industry Will Continue the Effort to Develop New Formulations That Meet the Market Needs (Field Life, Rain-Fastness, Etc.)
- ◆ Marketing opportunities Will Continue to Grow for Current Sub-Species / Strains



Thank You

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