



Bioprotection Market Update & 2020 Year in Review

DunhamTrimmer LLC

“The Premier Biological Industries Strategic Business Consulting & Market Research Firm”



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Industries

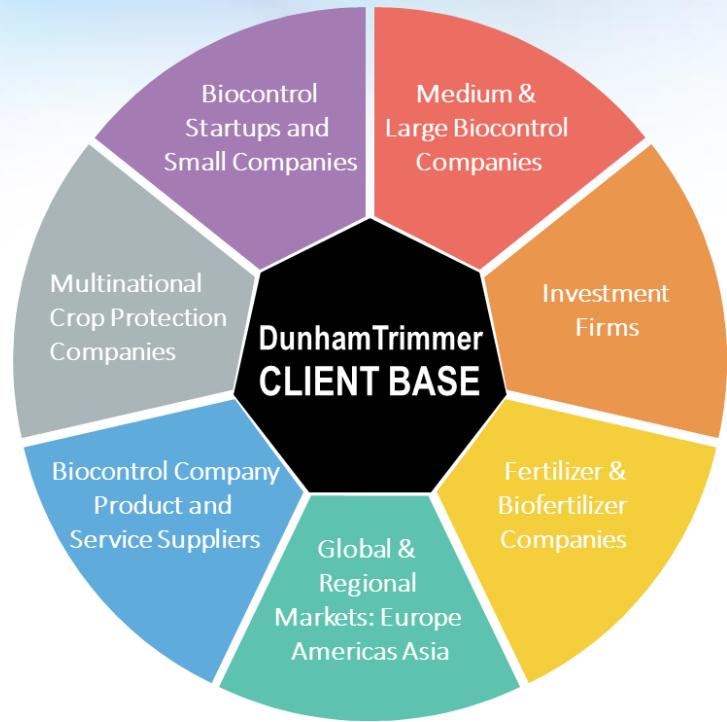
Biocontrol
 Biostimulants
 Biofertilizers

Services

Strategic Marketing
 Bio Market Data
 Technology Evaluation
 Market Evaluations
 Investment Due Diligence

Products

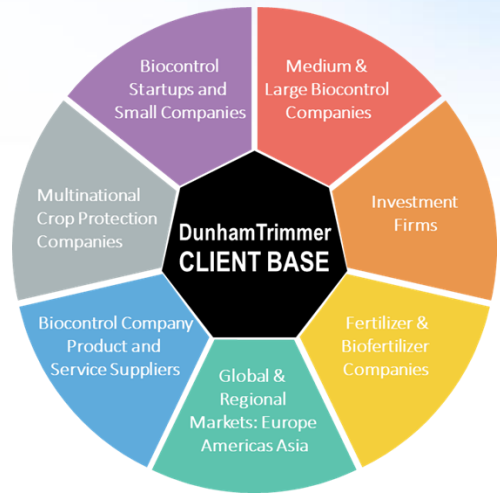
Single-Client Custom Projects
 Multi-Client Market Reports
 Retainer Support
 2B Monthly Newsletter



Biological Products

BIOLOGICAL PRODUCTS

Source: DunhamTrimmer®, LLC



CROP IMPROVEMENT PRODUCTS				BIOLOGICAL CONTROL PRODUCTS						
BIOFERTILIZERS ¹		BIOSTIMULANTS ²		BIOPESTICIDES ³		MACROORGANISMS ⁴				
NUTRIENT UPTAKE ENHANCERS		STIMULATE NATURAL PROCESSES		BIOCHEMICALS ⁵	MICROBIALS ⁶					
N FIXING	K MOBILIZERS	AMINO ACIDS	ORGANIC ACIDS (HUMIC AND FULVIC)	PLANT EXTRACTS	ORGANIC ACIDS	BACTERIA	FUNGI	INSECTS	MITES	NEMATODES
P SOLUBILIZER	OTHERS	MICROBIALS	SEAWEED EXTRACTS	SEMICHEMICALS	PROTOZOA	VIRUS				
					YEASTS	OTHERS				

1 Microbials used to enhance plant nutrient uptake from soil and atmosphere

- Nitrogen fixing bacteria make up largest group
- Others include mobilizers of specific nutrients (zinc, sulfur). In some markets, mycorrhizae are included in this category.
- Biofertilizers regulated under country/state fertilizer regulations
- New EU regulation to include N-fixing bacteria and mycorrhizae under Biostimulant umbrella, leaving door open to rest of Biofertilizers to be regulated under Biostimulant's name.

2 Biostimulants are products which mitigate abiotic stress, enhance crop quality and increase nutrient assimilation

- Seaweed Extracts and Amino Acids make up the largest segment in this group
- Microbials, primarily bacteria, often used as seed or soil treatment
- Organic acids are mainly Humic and Fulvic Acids used as soil amendments. Other Organic Acids of low molecular weight used at the foliar level to enhance some metabolic processes and/or nutrient availability.
- Definition and regulation of Biostimulants is under development in many parts of the world, though in most cases today they are regulated under country/state fertilizer regulations

3 Biopesticides are derived from natural materials, such as plants, bacteria and certain minerals. Biopesticides target specific pests and are inherently less toxic than synthetic pesticides.

5 Plant Extracts; Semiochemicals; Organic Acids

- Plant Extracts make up the largest segment in this group
- Semiochemicals (pheromones) has the largest actual number of products
- Largest challenge for Plant Extracts is manufacturing and consistent quality in the active ingredient(s)

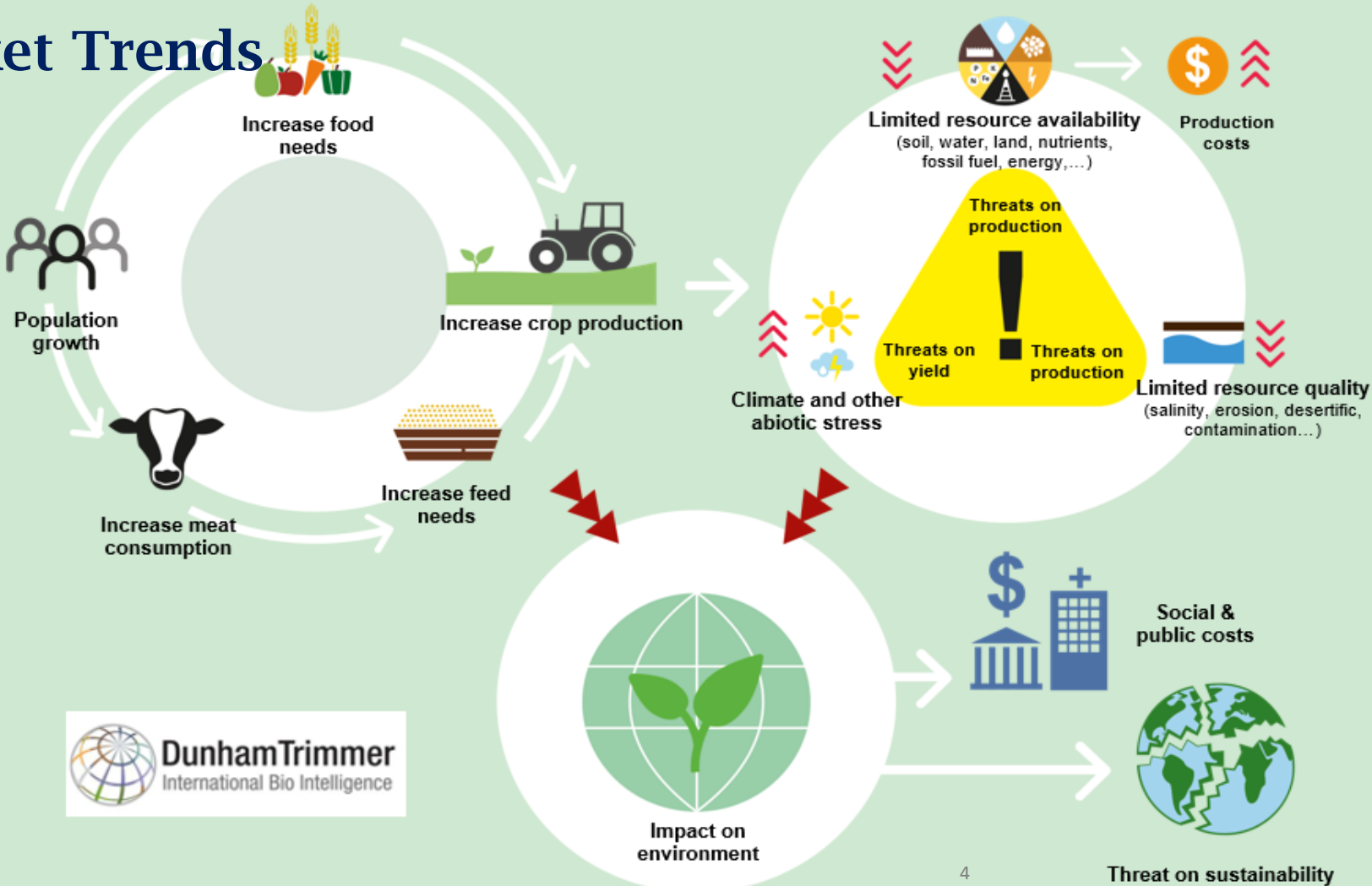
6 Bacteria; Fungi; Virus; Protozoan; Yeasts

- Bacteria, followed by Fungi, make up the largest groups commercially (>90%)
- Microbials are the largest market of biopesticides.
- Biggest challenges for microbials are formulation related to: 1) Shelf-life; 2) Stability; 3) Performance enhancement

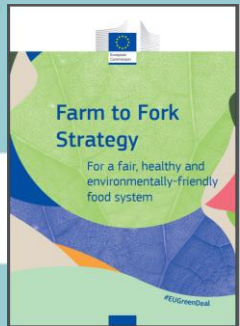
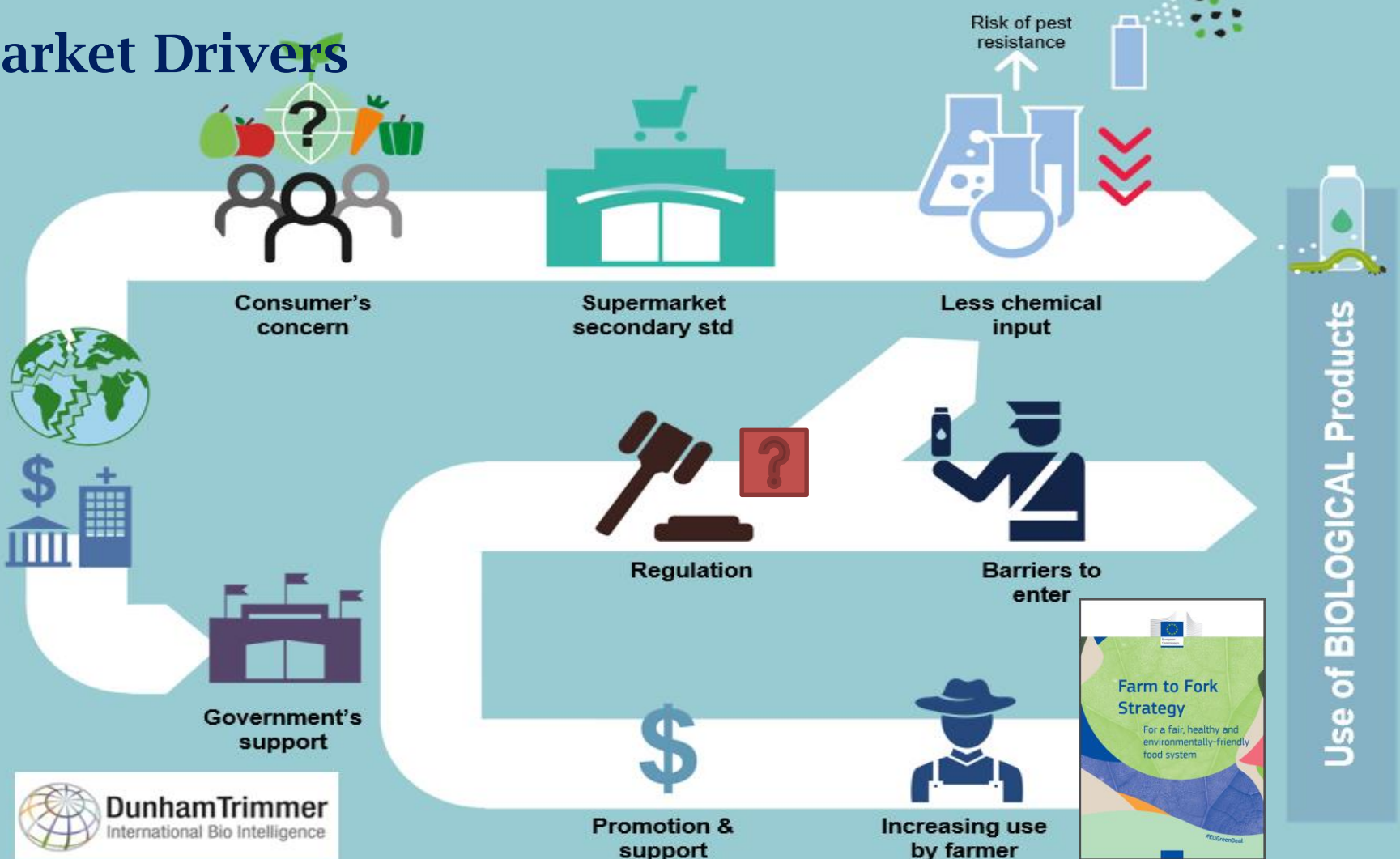
4 Insects; Mites; Nematodes

- Insects followed by mites make up the largest groups
- Unique in that the live organism in the form of eggs, larvae, pupae or adult is used.
- Most important challenge for Macros is logistics—shipping live organisms that have to have special care to survive
- Normally not classified as a Biopesticide—only as Biological Control Products

Market Trends

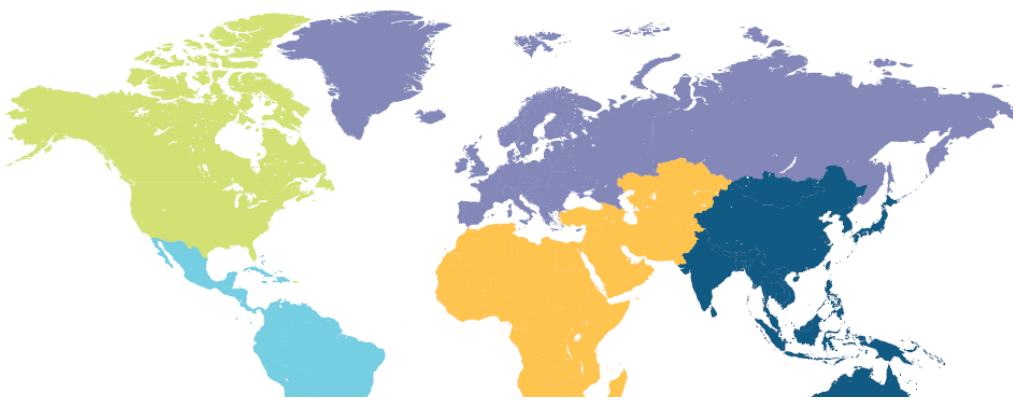


Market Drivers



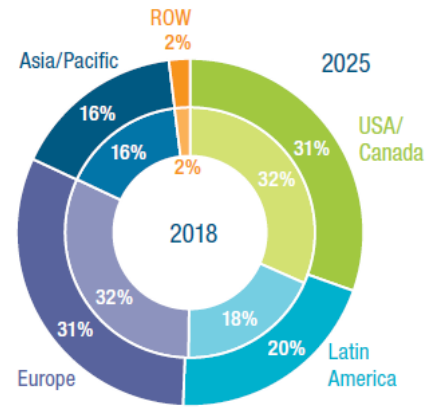
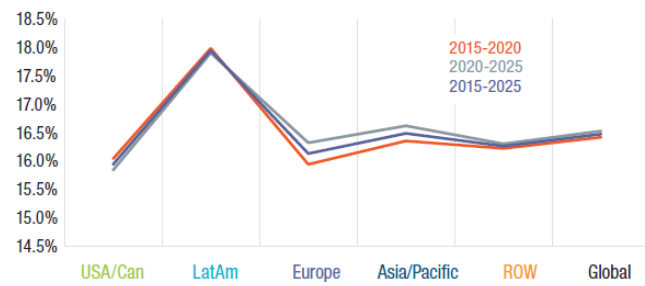
Bioprotection Forecast

2018 REGIONAL KEY STATS



	2018	2019	2020	2021	2022	2023	2024	2025
ROW	\$76	\$88	\$102	\$119	\$139	\$161	\$188	\$218
Asia/Pac	\$615	\$716	\$834	\$972	\$1,133	\$1,322	\$1,542	\$1,799
Europe	\$1,218	\$1,413	\$1,641	\$1,908	\$2,219	\$2,582	\$3,004	\$3,495
LatAm	\$712	\$841	\$991	\$1,168	\$1,377	\$1,624	\$1,915	\$2,258
USA/Canada	\$1,212	\$1,407	\$1,630	\$1,889	\$2,188	\$2,534	\$2,936	\$3,401
TOTAL	3,8 Bn	4,5 Bn	5,2 Bn	6,1 Bn	7,1 Bn	8,2 Bn	9,6 Bn	11,2 Bn

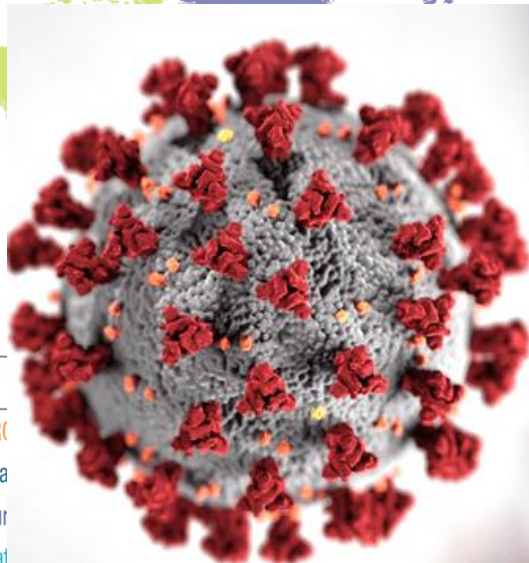
REGIONAL CAGR



Bioprotection Forecast

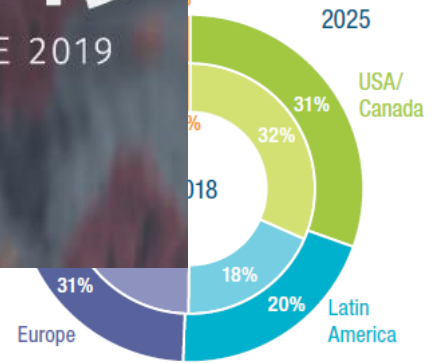
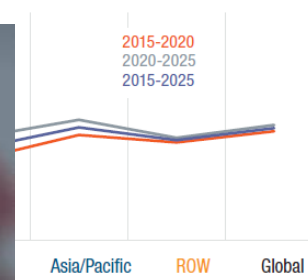
2018 REGIONAL KEY STATS

REGIONAL CAGR



COVID-19
CORONAVIRUS DISEASE 2019

18.5%



ROW
Asia
Eur
Lat

USA/Canada	\$1,212	\$1,407	\$1,630	\$1,889	\$2,188	\$2,534	\$2,936	\$3,401
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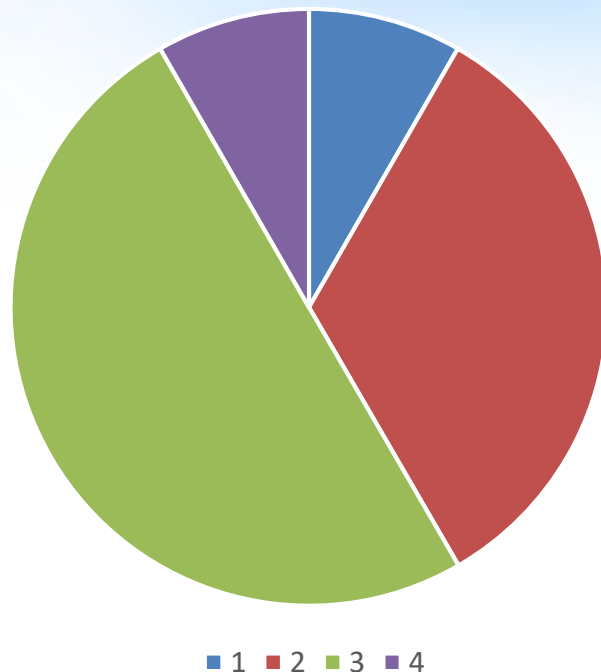
Oct 2020

Qualitative survey of leading bioprotection companies:

- What is your impression of the bioprotection market in 2020?
- How did COVID impact your business and how did you adjust?
- How have you adapted to a world where face to face meetings are not possible?
- What new techniques and skills has your organization adopted and which will you continue to use in a post-COVID world?
- Summarize 2020 in a few words

Bioprotection Growth 2020

Chart Title



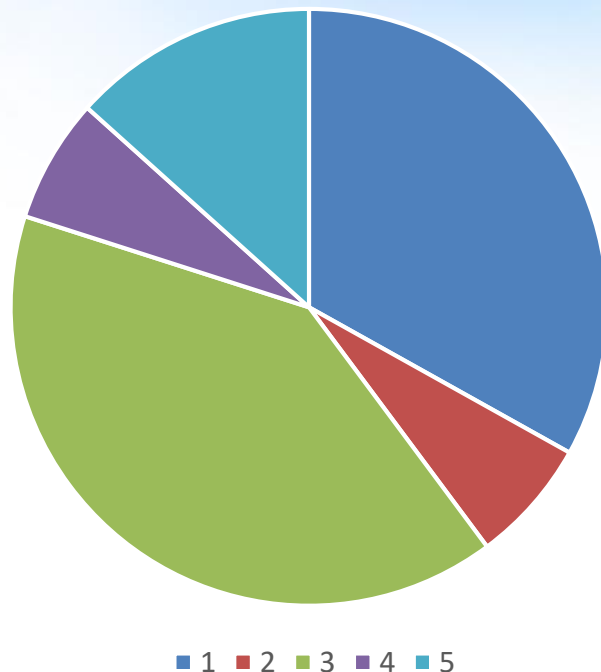
Over 40% say market growth \geq 2019

Slight decrease – specific markets or a reduction in demand for a limited period of time

Significant decrease – market declined by high single digit or double digits across major portion of the market

Main Business Activity Impacted

Chart Title

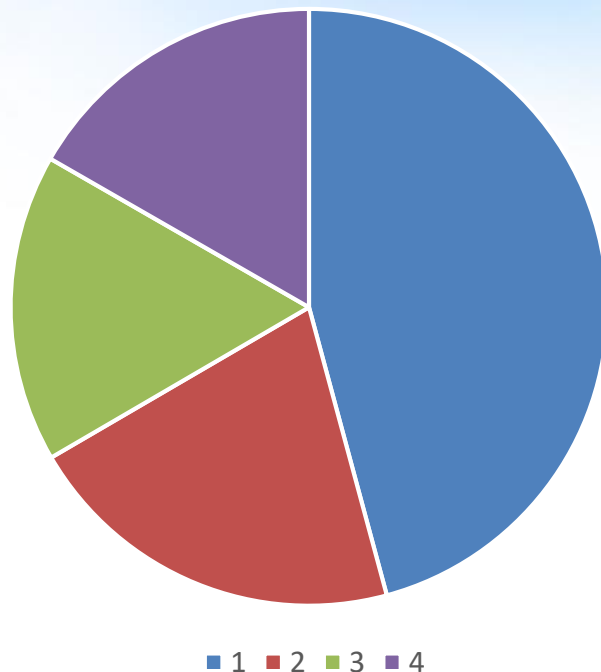


Sales & supply chain were main impacts

- Sales opportunities were present for those who could adapt and overcome hurdles created by COVID
- Registration processes often delayed as regulators worked from home
- Technical teams found planning and executing field trials challenging in some cases

How Did You Adapt your Communications?

Chart Title



COVID accelerated the adoption and use of digital tools

- Videoconference is primary
- Webinars for training and new product launches
- Face to face meetings limited
- Biggest challenge is developing new relationships remotely

Summarize 2020 in a Few Words

- An “atypical” year
- A hard year, but full of opportunities and discoveries
- Customer relationships can flourish virtually!
- A year of learning which will change our market approach in the future
- Unexpected opportunities combined with cautious optimism
- A “transformative” year which accelerated digital adoption
- Travel is not essential to be successful
- A “special” year with many challenges, but one in which we also learned a lot and continued to advance our projects
- Tomorrow’s operations will change based on what we learned in 2020

2020 Summary

- Global bioprotection market CAGR for 2020 will be lower than in previous years
 - Short term impact from shutdowns
 - Some longer term impacts in select crops and geographies
- CAGR will recover in 2021, but may not return to 2019 levels
- New communication tools will change how business is conducted in future



Biological industry consolidation

- During first half of 2020, the pace of M&A slowed as face to face meetings were not possible
 - Difficult to establish relationships and hold strategic negotiations remotely
- In the most recent quarter, we have seen a resurgence in M&A activity
 - We believe strongly the fundamental drivers of consolidation remain strong in this industry

Biological industry consolidation

M&A / JVs	Distribution—Mkt Access	R & D / Manufacturing
2020 – 12 Major Agreements	2020 – 19 Major Agreements	2020 – 17 Major Agreements
2019 – 29 Major Agreements	2019 – 21 Major Agreements	2019 – 11 Major Agreements
2018 – 34 Major Agreements	2018 – 19 Major Agreements	2018 – 17 Major Agreements
2017 – 17 Major Agreements	2017 – 31 Major Agreements	2017 – 11 Major Agreements
2016 – 24 Major Agreements	2016 – 13 Major Agreements	2016 – 08 Major Agreements
2015 – 23 Major Agreements	2015 – 04 Major Agreements	2015 – 12 Major Agreements
2014 – 24 Major Agreements	2014 – 22 Major Agreements	2014 – 16 Major Agreements
2013 – 16 Major Agreements	2013 – 14 Major Agreements	2013 – 09 Major Agreements

Source: **2B MONTHLY**, data for 2020 until 22nd September 2020

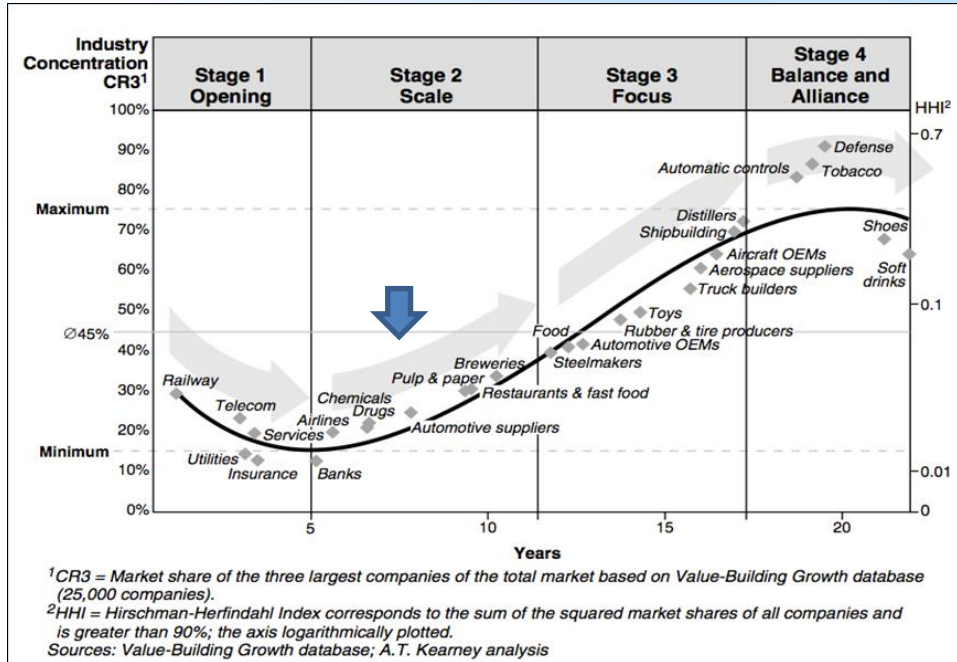


From 2013 to 2020, the Biological Products sector has seen¹:

- 179 relevant mergers, acquisitions and joint venture agreements
- 143 relevant distribution and market access agreements
- 101 R&D and manufacturing agreements

Since 2013, on average, a new biological products M&A or JV agreement is announced nearly every 2 weeks!

Bioprotection Industry Consolidation



Source: Harvard Business Review, December 2002

Consolidation drivers:

For global companies:

- Participation in fast growing market segment
- Integration of bio into portfolio to meet consumer demands
- Use strong market access fills major need for bio companies

For bio companies (and investment partners):

- Added technology and product types increases addressable market
- Broader product portfolio more attractive to distribution
- Expanded geographic presence
- Increasing footprint boosts cash flow and resources for reinvestment

2021 Prediction for Bioprotection

- Industry growth will rebound as the global impact of COVID subsides and allow sales promotion efforts to return to normal levels
- Long term sustained growth at these levels will require bioprotection to expand its footprint beyond the current focus in fruit and vegetable markets
 - Increased use in row crops
 - Development of effective bioherbicides
- Merger and acquisition activity will recover to previous levels as consolidation forces remain strong.
 - Consolidation will continue until market leaders capture a dominant share of the market
 - We expect a high percentage of deals will occur between companies already present in the market
 - There will be participation by global companies as well as new entrants (precision ag, data companies, etc.)



Global Biostimulant Market Report

Comprehensive, global Biostimulant market data and analysis
from DunhamTrimmer, the world's leading authority on
Biological Business Intelligence for agriculture.

Thank You

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