

AgbioInvestor

Global Crop Protection Market Performance



- Declining agrochemical pricing
- High inventories
- High pest pressure and favourable weather in key markets sustains usage on the ground





GLOBAL

- Potential for recovery from adverse weather (e.g. US, Europe).
- El Niño event expected to break dry conditions in southern South America, but southern Asia and Pacific expected to experience reduced rainfall.
- Lower agrochemical prices.
- High inventories.
- Commodity prices lower than 2022, but remain high by historical standards.
- Fertiliser and energy costs expected to fall in 2023 from peaks in 2022, but still high.
- Disconnect between ex-company sales and usage on the ground
 - Inventories built up due to high levels of pre-purchasing to alleviate supply concerns and unfavourable mid to late season weather on key regions (Western US, Europe)
 - Retailer and on-farm stocks now being used, with usage on the ground sustained due to relatively high pest pressure and improved conditions in aforementioned regional markets
 - Company sales also impacted by overall reduction in agrochemical pricing.

Crop Protection Market in 2023: Preliminary market estimates suggest growth of 2.8% in nominal terms

Key Factors

- **North America:** increased maize area; improved weather conditions in west / California; relatively high commodity prices; weakening agrochemical prices; inflation and high input costs.
- **Central & South America:** higher maize and soybean areas in Brazil; high pest pressure; lower agrochemical prices, but severity of reduction having more limited effect in southern hemisphere crop season; very dry conditions in Argentina, parts of southern Brazil.
- **Asia Pacific:** positive early season in many regions, although onset of El Niño has led to dryness impacting Australia, southeast Asia; less favourable conditions in India, inventory build-up; weather conditions highly variable, extreme heat an issue in many countries; high pest pressure in several key markets, notably China.
- **Europe:** Cereal area up slightly; maize area down, but yields recovering from very poor 2022, product usage expected to increase; high disease pressure (including Septoria) in several countries; weather generally more positive compared to 2022, although some southern countries impacted by extreme weather events; agrochemical pricing sustained at high levels compared to other regions; growth continues to be hampered by Russia / Ukraine conflict.

Region	2021 (\$ m.)	2022 (\$ m.)	Change 22/21 (%)	2023 Preliminary (\$ m.)	Change 23/22 (%)	Currency	Volume	Price
North America	10,333	12,684	22.8	12,963	2.2		+	+
Central & South America	18,735	22,979	22.7	22,979	6.3	+	++	+
Asia Pacific	20,330	22,609	11.2	22,609	-1.5	---	++	+
Europe	13,736	13,713	-0.2	14,549	6.1	--	++	++
MEA	2,641	2,770	4.9	2,623	-5.3	--		+
Total	65,775	74,755	13.7	76,832	2.8	--	++	++

Political Control Now Centres on Environmental Controls

Targets range between 2030 – 2050

Generally, the key themes behind legislation focus on:

- Substantially increasing agricultural production
- Reduce pesticide volume use
- Reduce nutrient losses
- Reduce fertiliser use
- Substantially increasing organic farming areas

Recent Political Initiatives

The European Green Deal

- Farm to Fork
- EU Biodiversity Strategy

United Kingdom

- Brexit
- National Action Plan for the Sustainable Use of Pesticides (NAP)

Japan's Green Food System Strategy

USA's Agriculture Innovation Agenda (AIA)

China's 14th Five-Year Plan

- National Agriculture Green Development Plan (2021–2025)
- National Pesticide Industry Development Plan (2021–2025)

Canada's Healthy Environment and Healthy Economy Plan

Australia's National Agriculture Innovation Agenda

Brazil's ABC+ Plan

Source: AgbioInvestor's Sustainability Policies & Agriculture Report

- Demand for low residue produce from consumers and food groups
 - E.g. PAN-UK surveys supermarkets and ranks related to their action on pesticides
- Expected to aid increase demand for biopesticides:
 - Particularly large farms with direct links to retail
- Traceability may be a key issue for regulators to enforce standards:
 - Enabled by **digital agriculture**

Digital Systems for Food Traceability
 Enable tracking of history, distribution, location and application of food products. Helps ensure reliability of sustainability claims and enhances transparency.

Growers
 Document source, methods and standards.

Manufacturers / Distributors
 Digitise data on secure systems.



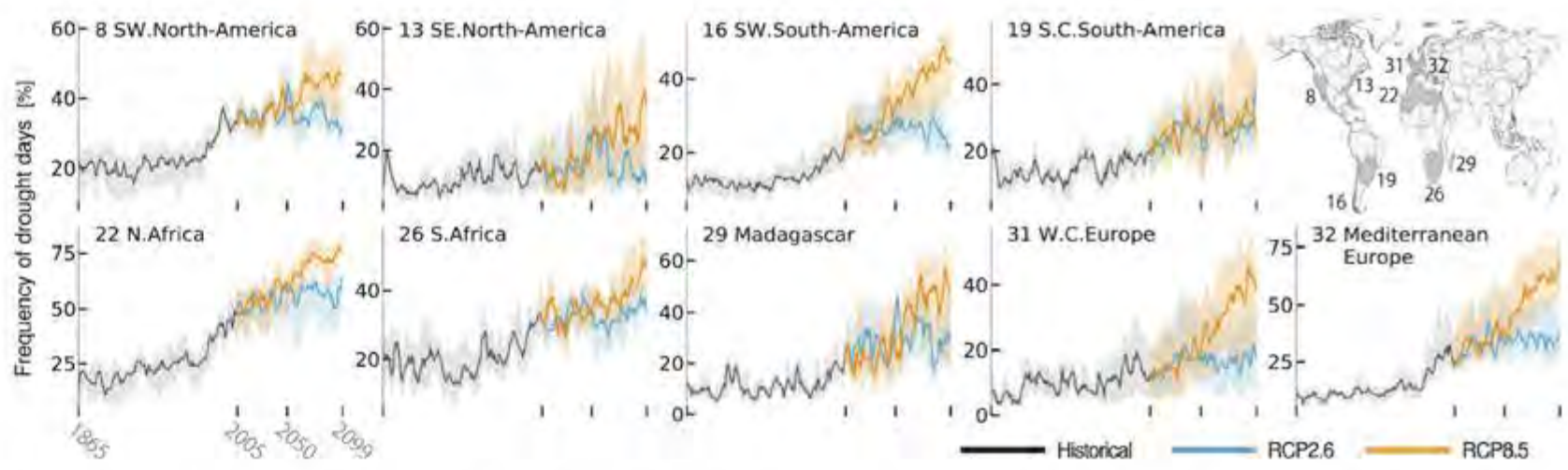
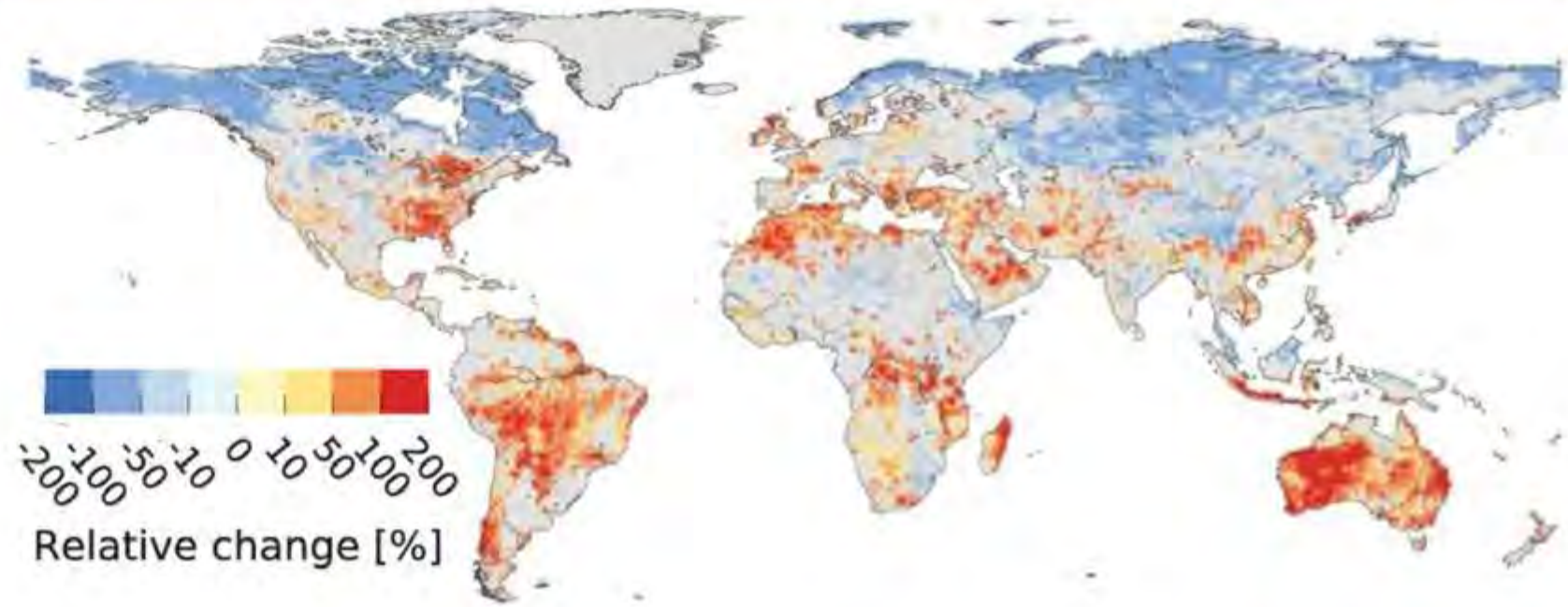
Consumers
 Scan products for information on food production process.

Retailers
 Monitor produce, communicate with consumers & reduce food waste.

Source: Adapted from eitfood - <https://www.eitfood.eu/blog/how-can-digital-traceability-increase-trust-in-the-agrifood-industry>

- Drivers of environmental change create uncertainty for growers, and can have substantial yield impacts:
 - Climatic change expected to increase frequency of droughts even under low temperature growth scenarios (see chart)
- Change in farmer strategy towards drought resilience
- Traits can also help protect against extremes of heat, drought, salt etc.
- Biostimulants can act as an “insurance policy” for growers facing increasingly volatile climate impacts

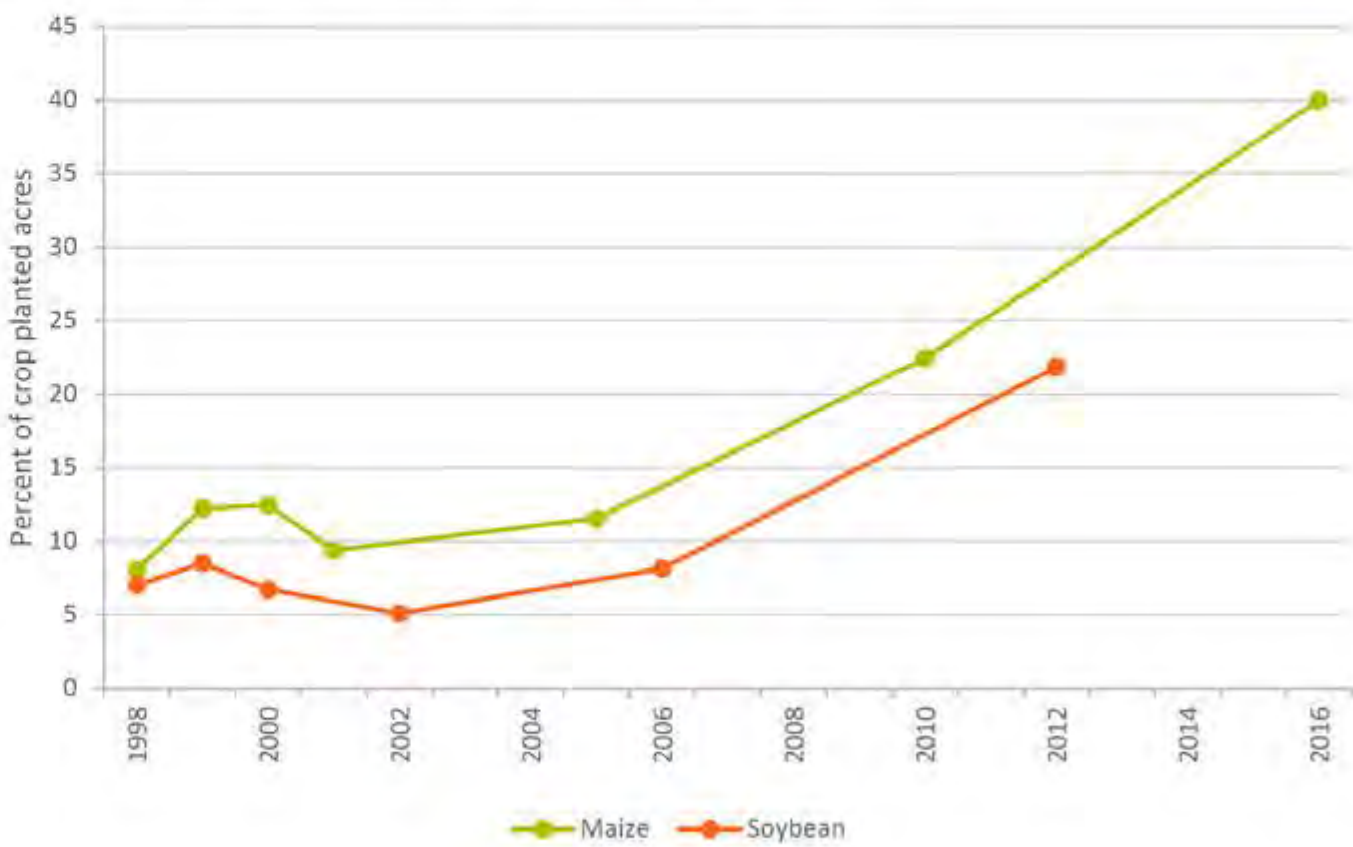
Change in Frequency of Drought Days Under RCP2.6 Scenario (Low emissions, limited temperature growth)



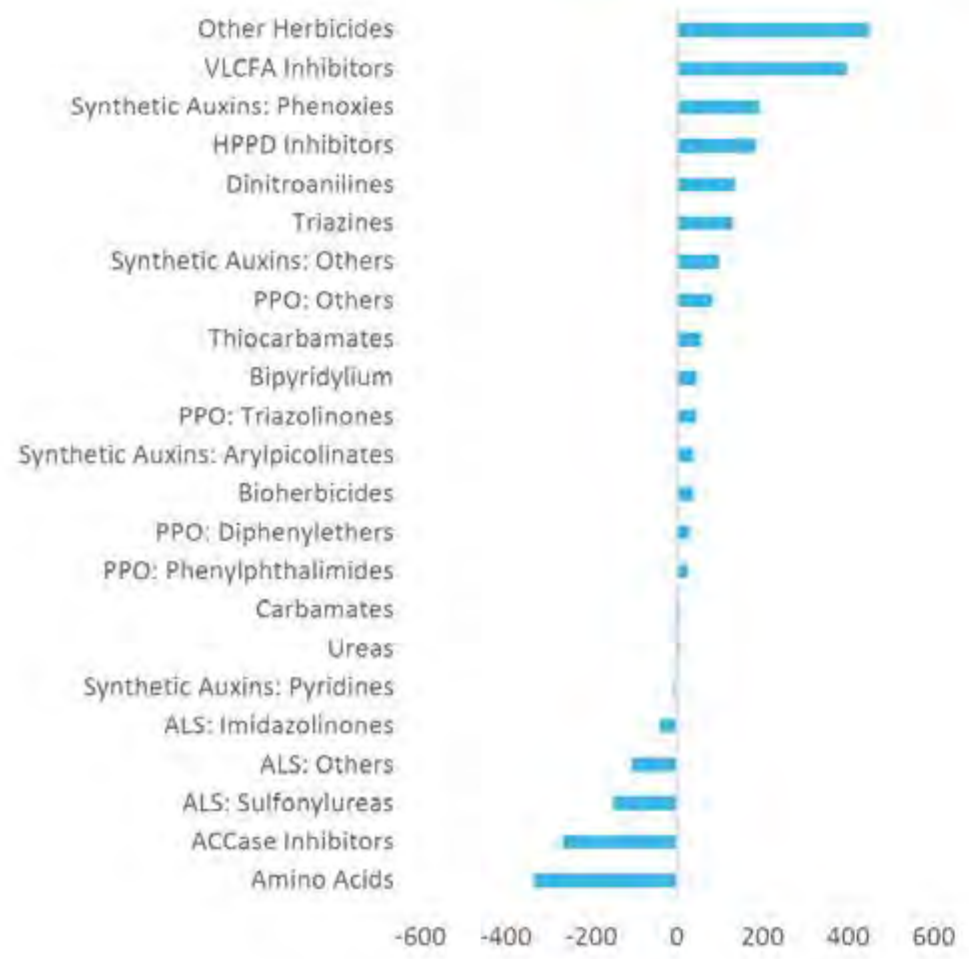
Source: Adapted from Satoh, Y., Yoshimura, K., Pokhrel, Y. et al. The timing of unprecedented hydrological drought under climate change. *Nat Commun* 13, 3287 (2022). <https://doi.org/10.1038/s41467-022-30729-2>

- VRA adoption expected to have key and initial impact in herbicides
- Some offset of volume for higher priced specialised formulations
- Expect impact to accelerate in 2025-2030 period, majority of impact post-2030
- Eventual move into fungicides, though cost-saving much less easy to demonstrate

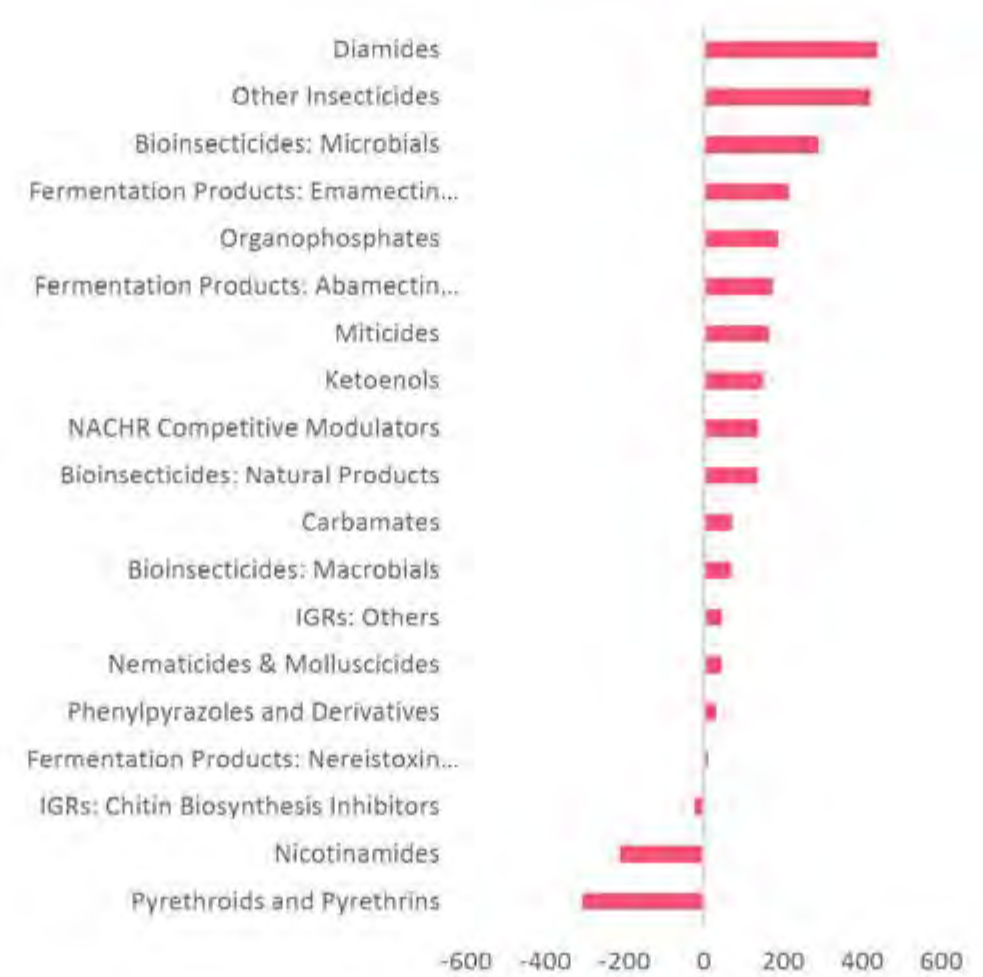
Adoption of Variable-Rate Technology (VRT) by Crop, 1998-2016



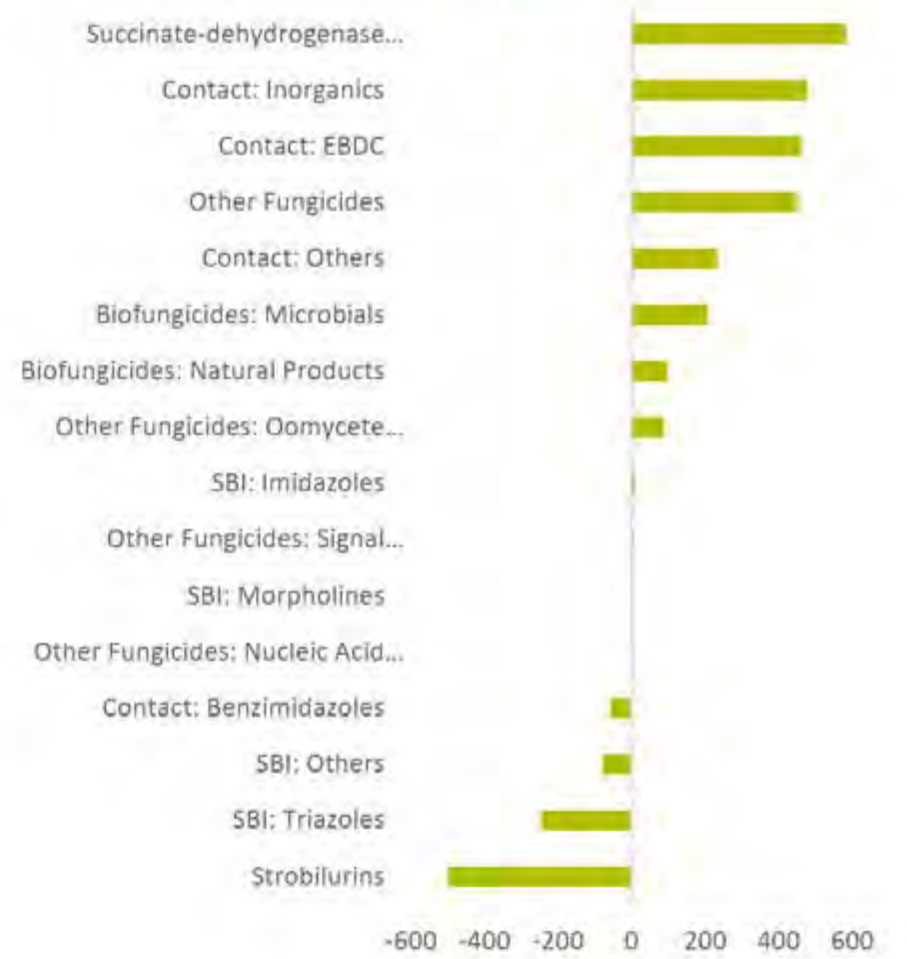
Herbicides



Insecticides

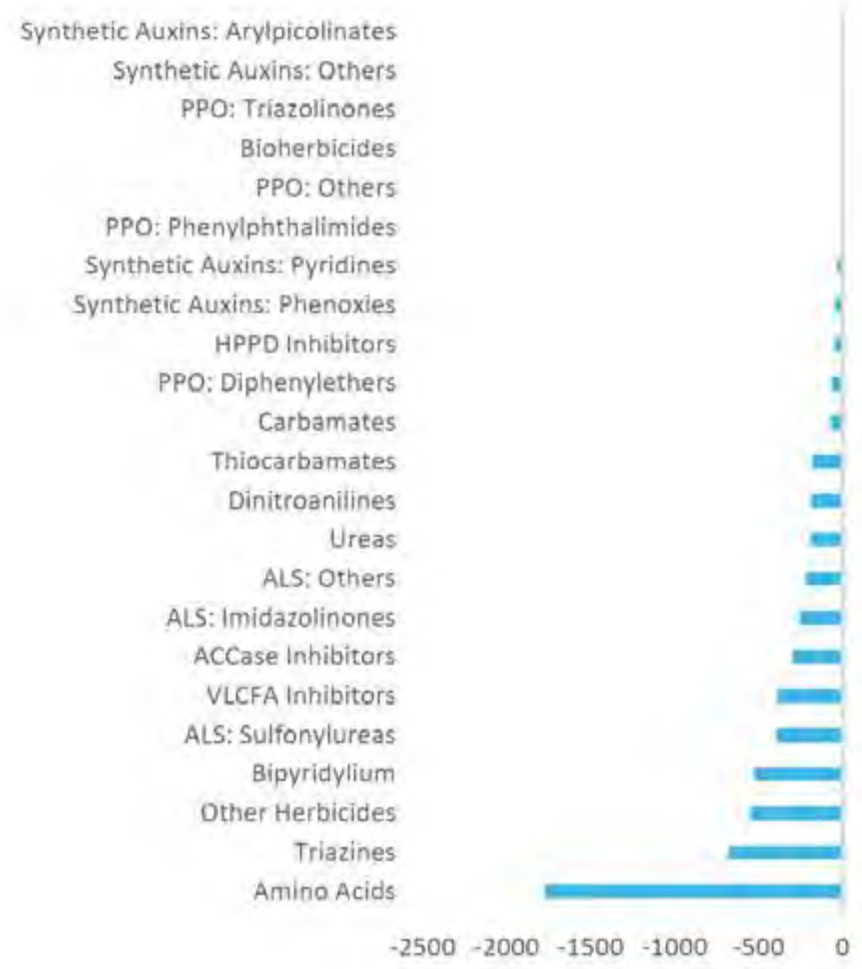


Fungicides

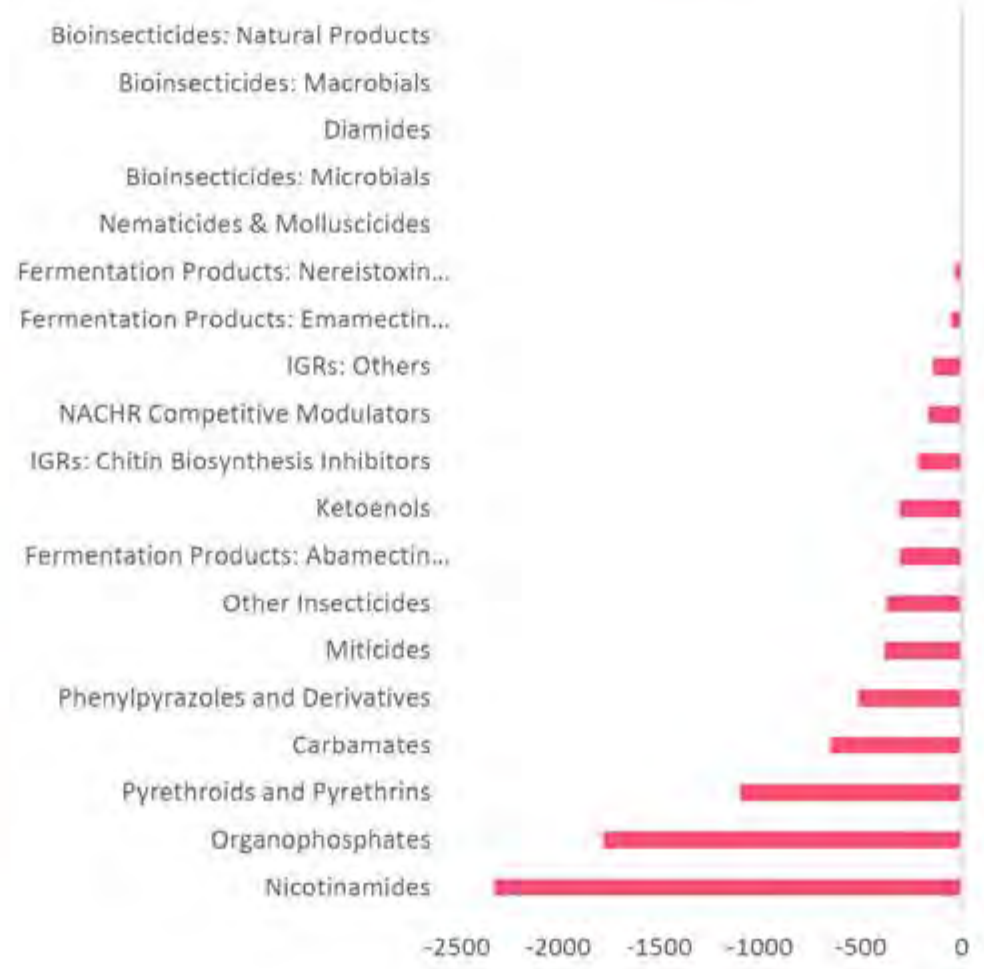


Note: Charts show total real terms value loss/gain due to resistance between 2020 and 2035.
 2020 baseline predates recent significant price increases
 Forecasts in Real terms (i.e. constant price + currency)

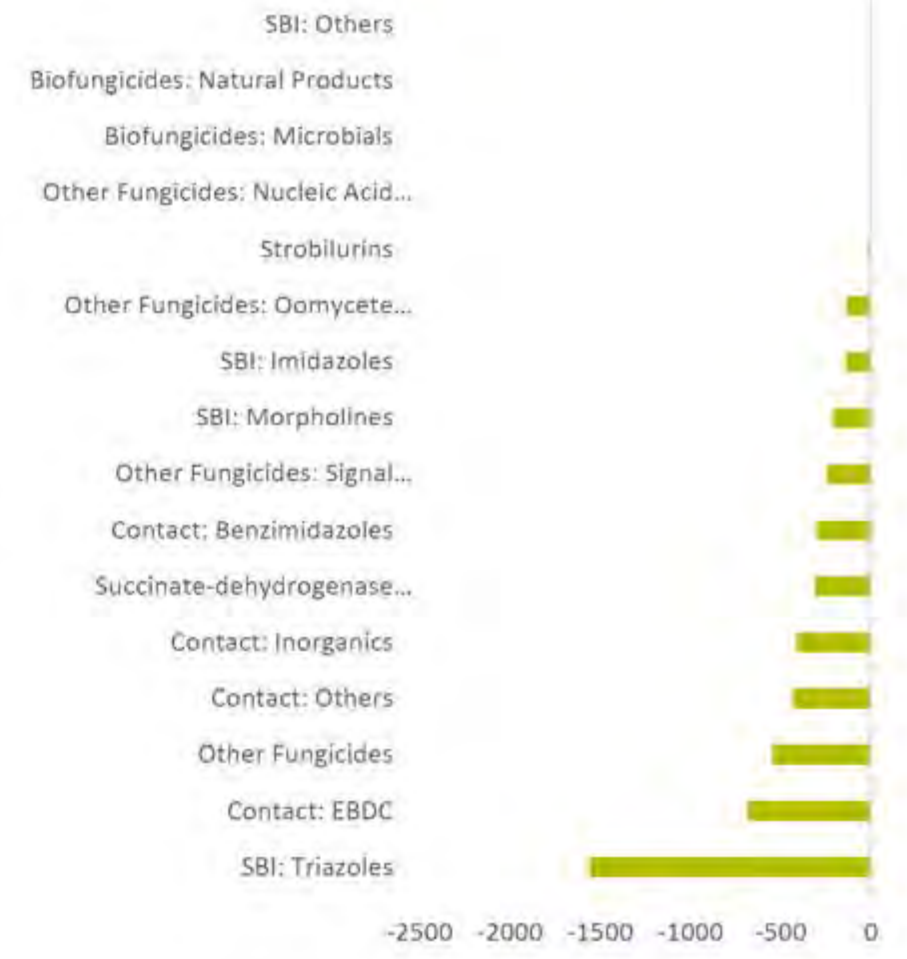
Herbicides



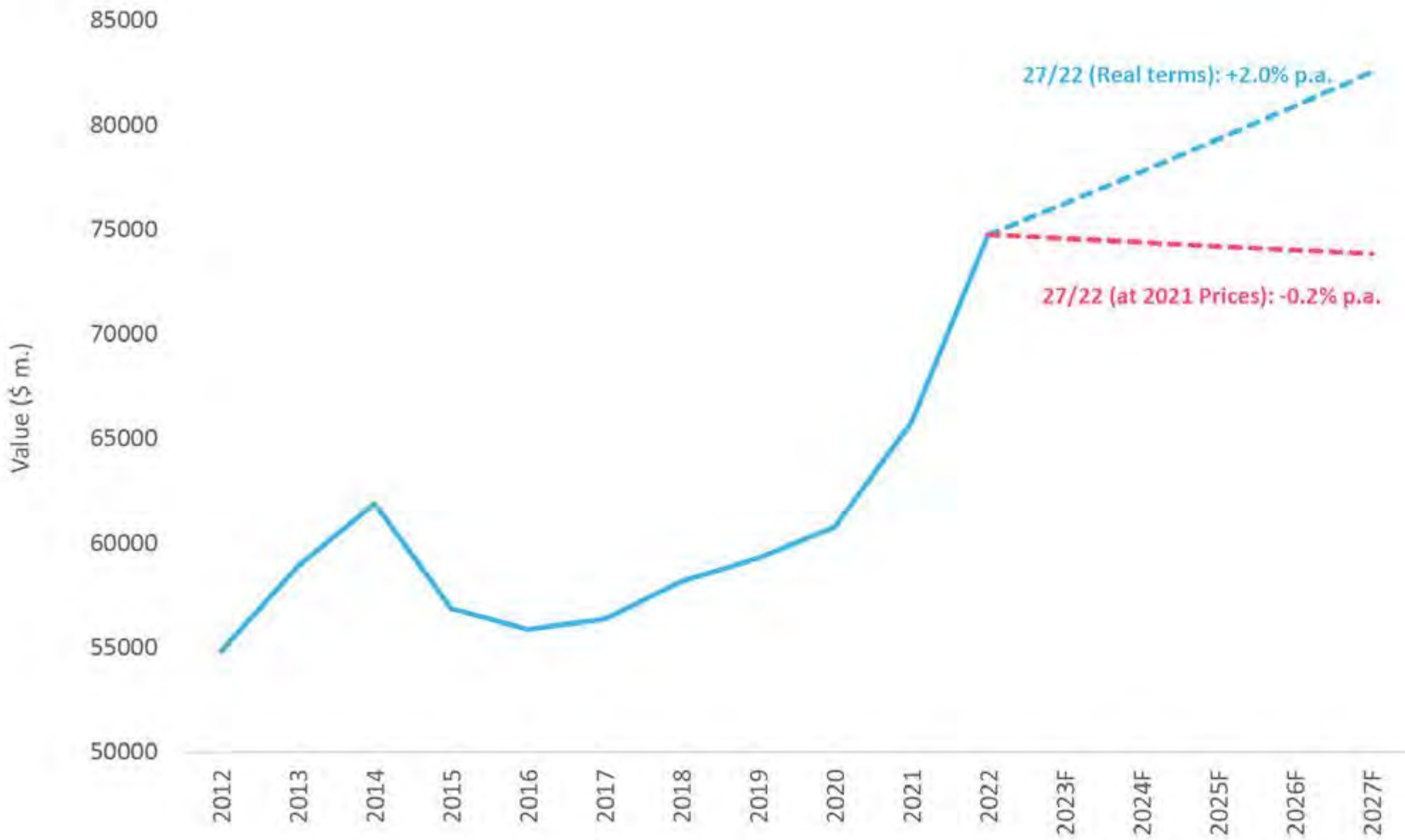
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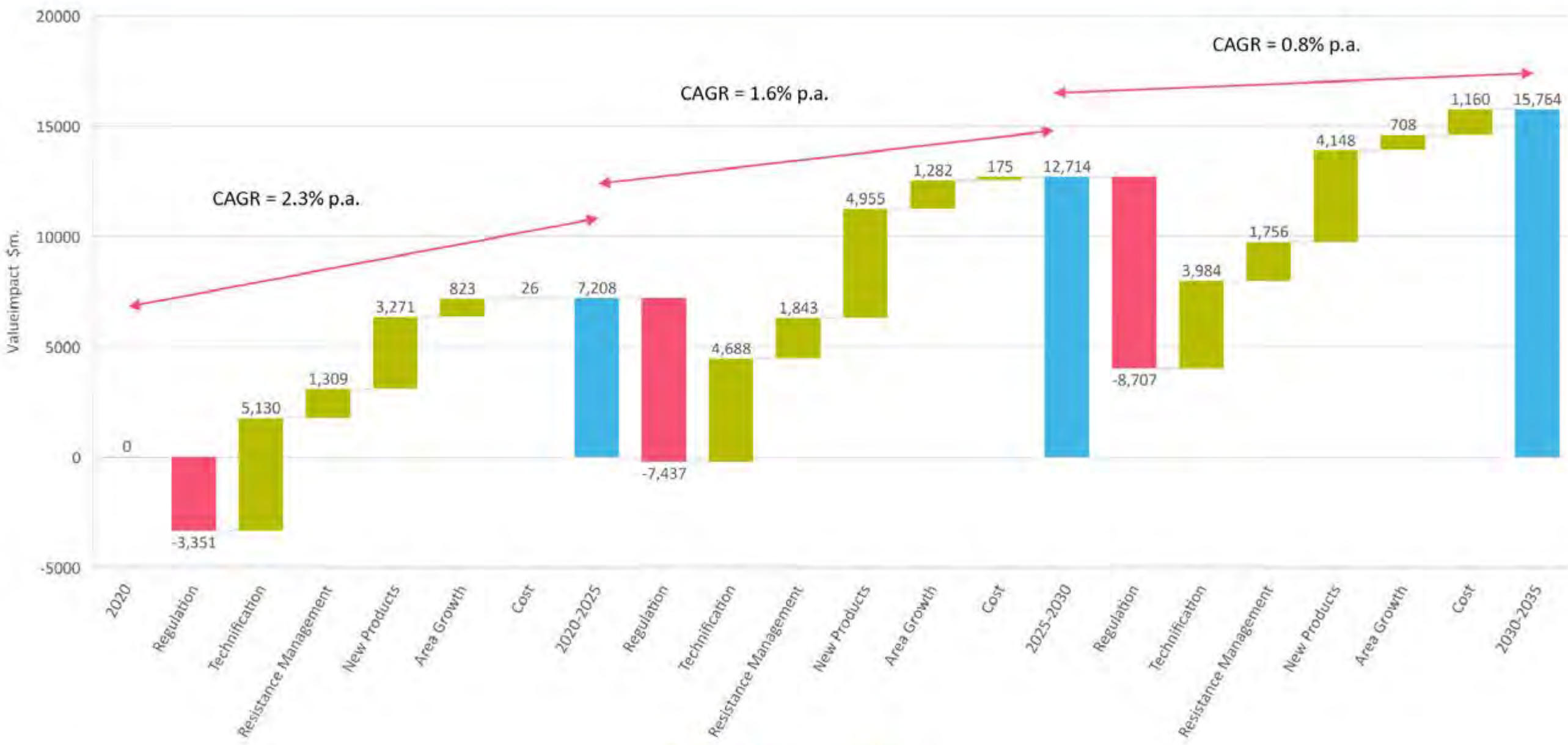
2022
 Significant gain from high pricing environment
 Volumes relatively stable
 Strong commodity prices

2027F

Positive Drivers
 Pest resistance development aids value
 Developing markets (e.g. SE Asia, MEA) drive volumes
 Further uptake on seed treatments and biologicals

Negative Drivers
 New GM areas and traits detract from value and volume
 Accelerating impacts of variable rate applicators on volumes
 Commodity and Input price normalisation

Crop Protection Market Forecast 2025-2030-2035



Note
2020 baseline predates recent significant price increases
Forecasts in Real terms (i.e. constant price + currency)

■ Increase ■ Decrease ■ Total

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Thank you!

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