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# 23

# Agrochemicals: Biologicals & Precision Formulations

Formulation-ready intermediates, the rise of biocontrol, and the precision-delivery shift — what the 2026 market actually rewards.

**≈$83bn**
Crop-protection market, 2025

**14.6%**
Biopesticides CAGR, to 2030

**$13.7bn**
Syngenta CP sales, 2025

**600,000**
DJI agri-drones in use

IMP InterMediaPartners GmbH · Wuppertal

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## Executive read

The headline story sold to the market is simple: regulators are forcing synthetic chemistry out, biologicals are rushing in, and drones are replacing the sprayer. Each claim is directionally true and, in its simple form, misleading in ways that matter to anyone allocating capital or R&D.

The binding European law that was meant to halve pesticide use was withdrawn in 2024. Glyphosate was re-approved to 15 December 2033. The American “Make America Healthy Again” push that named glyphosate and atrazine in May 2025 had dropped specific action by September. **Neither initiative ultimately produced the market disruption originally anticipated.**

And yet the biologicals curve did not bend. Agricultural biologicals are compounding at low-to-mid double digits while conventional crop protection grows at low single digits. The reason is the part the headline misses: the driver is not a single prohibition but the **slow attrition of approved chemistry**, the **pull of lower-residue retail demand**, and a deliberate **regulatory de-risking of biocontrol approval**. The phase-out narrative is a poor predictor; the attrition-and-pull narrative is a good one.

The same correction applies to precision delivery. The binding constraint on drone spraying is not the aircraft — DJI alone says more than 600,000 of its agricultural drones were in use worldwide by 2026. The constraint is the **label**: the product-by-product authorisation for aerial application, which much of Asia has built and the West largely has not. Region-specific, formulation-ready intermediates are not a trend separate from precision delivery — they are its precondition.

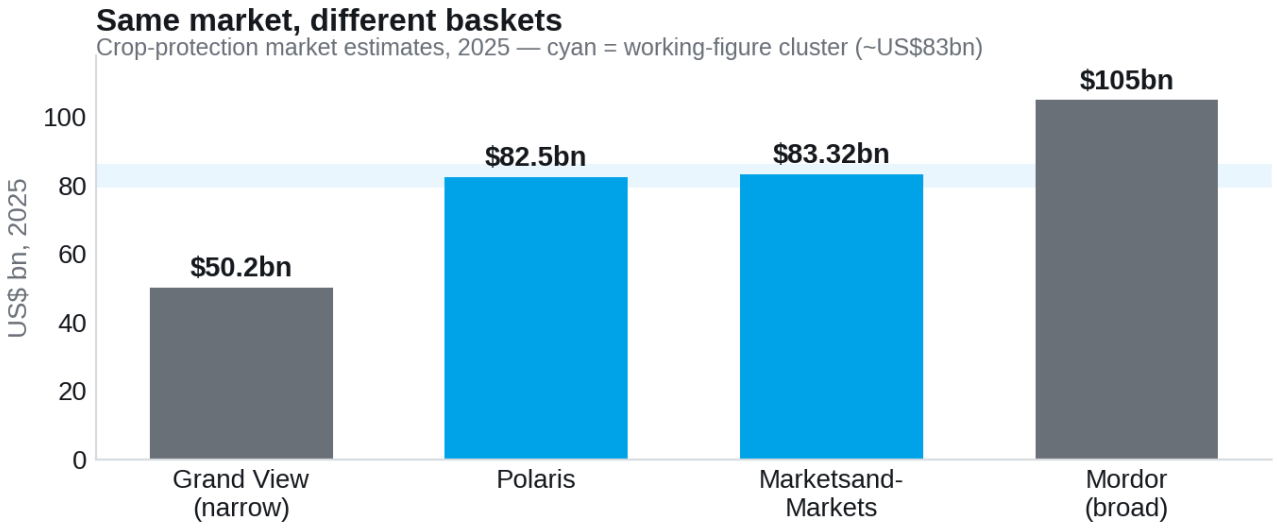
For an integrated major — Syngenta is the worked example throughout, alongside Bayer, Corteva and BASF — the strategic question is not “how fast do synthetics die.” It is: **who owns the formulation, the regional registration and the agronomic relationship when the active-ingredient mix turns over.**

> **KEY FINDING**
>
> **The defensible position in 2026 is not a molecule. It is control of the formulation, the regional registration, and the channel to the grower — the three things a generic-active price war and a single regulator cannot easily take.**

# 1 THE BUSINESS OUTLOOK

### A low-growth core wrapped around a high-growth edge.

Published estimates for the global crop-protection market diverge sharply because providers measure **different baskets**. The spread is a scope disagreement worth naming explicitly. MarketsandMarkets puts 2025 at US$83.32bn (~5.0% CAGR to 2030); Polaris Market Research at ~US$82.5bn (~5.4%), independently; Grand View Research at only US$50.2bn on a deliberately narrower scope; and Mordor Intelligence at ~US$105bn on a broader one.




*Crop-protection market estimates, 2025. The cyan band marks this paper's working figure (~US$83bn). Sources 1–4.*

*[Flagged] The 2x gap between Grand View (~$50bn) and Mordor (~$105bn) is almost entirely a definitional artefact: some count branded products only, others include generics; some include seed treatments and adjuvants/co-formulants, others exclude them. This paper uses crop-protection chemicals (herbicides, insecticides, fungicides and closely related products) and treats **~US$83bn in 2025 at ~5% CAGR** as the working figure. The much larger agrochemicals market that includes fertilizers (~US$300bn) is a different category and is not used here.*

On volume, the most authoritative anchor is official: **FAO/FAOSTAT reports global agricultural pesticide use at 3.73 million tonnes of active ingredients in 2023** [Official] (down ~2% on 2022, roughly double the 1990 level). Market-research estimates of formulated-product tonnage run somewhat higher (~4 million tonnes) — a basis distinction, not a contradiction. The signal across all bases is the same: volume is broadly flat-to-slow, so value growth comes from **mix** — higher-value, patent-protected chemistries and premium formulations — not from spraying more.

## The high-growth edge (a subset of the above, not additional to it)

- **Biopesticides:** ~US$8.9bn in 2025, rising to ~US$17.7bn by 2030 at a **14.6% CAGR** (MarketsandMarkets) [Market est.]. Some forecasters model higher rates (17–18%); this paper uses the 14–15% anchor and notes the higher band exists rather than relying on it.
- **Agricultural biologicals** (biopesticides + biostimulants + biofertilizers): ~US$18.4bn in 2025, ~13.7% CAGR (MarketsandMarkets), corroborated by Fortune Business Insights (~US$17.2bn, ~14.6%) and SNS Insider (~US$17.8bn, ~14.2%) [Market est.].
- **Adoption context (scale, not adoption rate):** the world has 570m+ farms, of which 475m+ are under 2 hectares (FAO/Lowder et al.) [Official]. Biologicals remain a minority of total crop-protection spend — fast-growing, but not yet a majority of value, treated hectares, or farms.

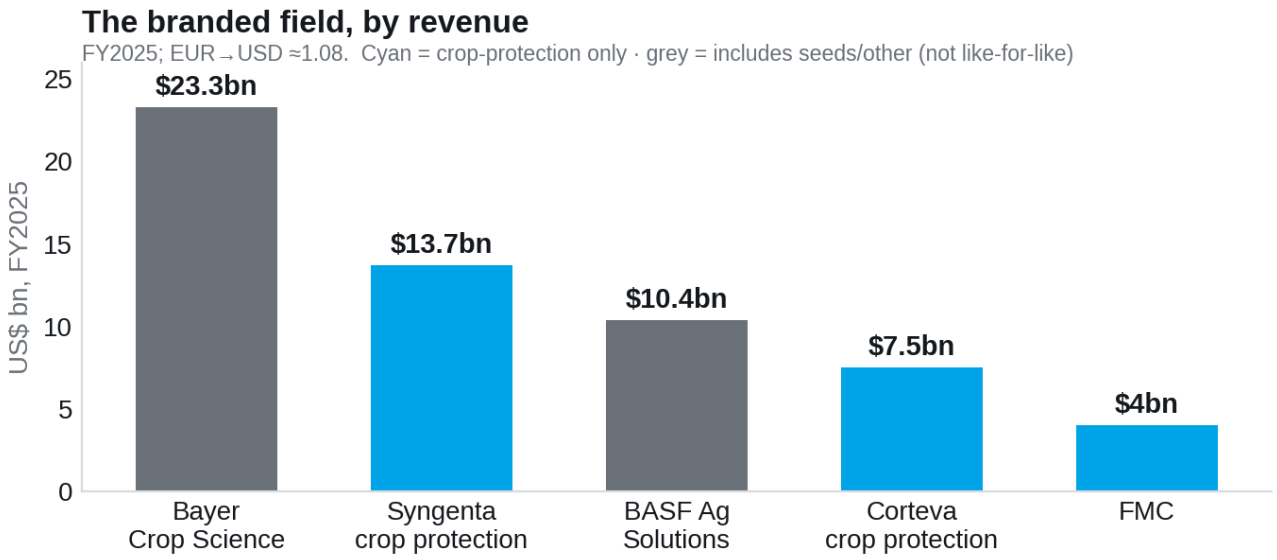
KEY FINDING

**Biologicals are the growth rate; synthetics are still the revenue. A major that treats them as opposing camps misreads the market. The portfolios that win are integrated — biological and chemical sold as one programme.**

## Players, revenue and share

The branded market is concentrated. Most recent full-year figures follow — with the essential caveat that divisions bundle seeds and crop protection differently, so these are not strictly like-for-like.

| Company | FY2025 figure | Scope / note |
|---|---|---|
| **Bayer Crop Science** | €21.62bn | CP + seeds (large seed component); EBITDA margin 19.4%; Roundup/glyphosate litigation overhang |
| **Syngenta Group** | US$13.7bn CP (group US$28.4bn) | CP figure is CP-only; group incl. Seeds, ADAMA, China; EBITDA US$4.4bn (15.4%); Sinochem-owned; Cropwise |
| **Corteva** | ~US$7.5bn CP (total US$17.40bn) | Seed ~US$9.9bn + CP ~US$7.5bn; op. EBITDA US$3.85bn; CP growth led by new products + biologicals |
| **BASF Agric. Solutions** | €9.59bn | Mostly CP + some seeds/traits; ~30% H1 EBITDA margin before special items; glufosinate-P launch |
| **FMC** | ~US$4.0bn | Pure-play crop protection (no seeds); diamide franchise; divesting India commercial business |
| **Others** | — | UPL, ADAMA (Syngenta-affiliated), Sumitomo Chemical, Nufarm, plus Chinese majors moving up-market |




*Agricultural / crop-science revenue, FY2025; EUR converted to USD at ≈1.08. Cyan = crop-protection only; grey = includes seeds/other. Not strictly like-for-like. Sources 11–17.*

MarketsandMarkets classes BASF, Syngenta, Bayer, UPL and Corteva as “star” players. The top five hold the majority of the branded market, and each is now defending margin through **innovation mix and integration** (proprietary traits + chemistry + biologicals + digital) rather than volume — because volume is where the Chinese cost base is winning.

## 2 FORMULATION-READY INTERMEDIATES

### The quiet high ground.

The demand is real and accelerating: customers increasingly want **customised, region-specific formulations** matched to local soil chemistry, climate, crop mix and — crucially — local regulation. Three forces drive it. **Regulatory fragmentation:** as the EU removes actives one by one and regions diverge, a single global formula no longer clears every market; the product that matters is the regionally registered formulation, not the bulk active. **Resistance management:** resistance (Palmer amaranth, Conyza, the rice stem borer, brown planthopper) pushes growers toward stacked, multi-site formulations and tailored adjuvant systems — value that lives in formulation, not the molecule. **The China squeeze:** as Chinese suppliers commoditise off-patent actives, margin migrates downstream to whoever controls the finished, registered, agronomically-supported formulation.

According to trade-press interviews and industry analyses (rather than audited filings), Chinese producers themselves now describe formulation sales — not active ingredients — as their primary profit growth driver, and are registering formulations directly in high-value markets.

> ***Case — China climbing the value chain.*** *Pilarquim has pushed a branded nano-formulation line (Pilarnano) aimed at high-barrier EU / North America / Australia registrations, and CAC Nantong has launched branded products built on a patented compound (cyproflanilide) rather than selling bulk active — concrete signals of the move from commodity AI to differentiated, registered formulation.*

KEY FINDING

**"Formulation-ready intermediate" is another way of saying "the last defensible margin." It is the layer a generic-active price war cannot reach and a single regulator cannot delist wholesale.**

For an integrated major, the implication is a portfolio of **formulation platforms** (controlled-release, low-drift, drone-optimised, biocontrol-compatible) plus the regional registration machinery to deploy them — closer to a specialty-chemicals logic than a commodity one.

## 3 THE RISE OF BIOLOGICALS

### A stalled phase-out that still favours biocontrol.

The popular framing — stringent EU rules accelerating the end of synthetics — needs correcting, and the correction is what makes this section useful rather than a press-release echo.

- The **Sustainable Use Regulation (SUR)** [proposal — now withdrawn], which carried the binding 50%-by-2030 reduction target, was rejected by the European Parliament in November 2023 and **formally withdrawn by the Commission on 6 May 2024** (Official Journal) [Official].
- The 50% reduction targets survive only as a [non-binding target]; binding obligations revert to Directive 2009/128/EC and national action plans.
- **Glyphosate is approved to 15 December 2033** [binding law] under Commission Implementing Regulation (EU) 2023/2660, with new conditions (pre-harvest desiccation no longer permitted; member-state mitigation such as buffer strips).

*[Flagged] Glyphosate is EU-approved but not uniformly usable: several member states (Austria, France, the Netherlands, Belgium, Luxembourg, Germany) apply partial national bans or area restrictions, and NGO legal challenges to the renewal continue. "Approved to 2033" should not be read as "unrestricted everywhere."*

So the mandate to force synthetics out, in the bluntest sense, stalled. The growth driver is not prohibition. It is a combination of:

- **Active-ingredient attrition** [binding law, ongoing]. Routine re-evaluation keeps removing chemistry on its own schedule: chlorpyrifos and chlorpyrifos-methyl, mancozeb, and the three outdoor neonicotinoids are gone or going; substances are reviewed every 7–15 years and quietly not renewed. This is not a one-way collapse of available chemistry — new actives, new biologicals and improved formulations continue to enter — but the net effect on growers is a shrinking, shifting toolbox that rewards alternatives.
- **Market pull.** Major retailers increasingly favour lower-residue sourcing programmes, and the EU's 25%-organic-land-by-2030 ambition [non-binding target] plus national subsidies (France committed €45m in 2024 to biopesticide adoption) reward biocontrol regardless of any single law.

- **Regulatory de-risking of the alternative** [proposal/announced]. The Commission's Vision for Agriculture and Food (Feb 2025) signalled intent to fast-track biopesticide and biocontrol approvals — a clearer biocontrol definition and provisional authorisation while evaluations continue. The problem being solved: EU biocontrol approval averages **7–9 years versus 2–3 years** in the Americas and Asia. Note that no agricultural fast-track is yet codified — it remains an intention pending a legislative vehicle.

*[Flagged] Earlier drafts attributed this fast-track to "the 2026 Biotech Act." That is imprecise. The Biotech Act proposed on 16 Dec 2025 (COM(2025) 1022) is health/biomanufacturing-focused, not agricultural; a broader "Biotech Act II" is only announced for Q3 2026 in the Commission Work Programme. The biocontrol fast-track traces to the Vision for Agriculture, not to an enacted Biotech Act. Treat all of this as direction-of-travel.*

KEY FINDING

**In Europe the case for biologicals rests less on prohibition than on the slow disappearance of approved chemistry — and on who controls the formulation once it does.**

### The honest constraints

This is not a frictionless transition. Biopesticides carry **higher production and formulation cost** (fermentation under sterile conditions), and many microbial products require **cold-chain handling and have shelf lives measured in months rather than the years typical of synthetic chemistry**, alongside variable field efficacy and fragmented global registration. These are the real reasons biologicals remain a minority of crop-protection spend despite a decade of enthusiasm. The majors that win will be those that solve **shelf-stability and tank-mix compatibility** so biologicals behave like conventional inputs in the grower's existing routine — exactly the formulation problem of §2.

***Case — solving the stability problem.*** *Croda's Atlox BS-50, a ready-to-use delivery system for spore-forming microbes, is an example of the formulation engineering now making biologicals field-robust and compatible with standard handling — turning a fragile biological into something that behaves like a conventional input.*

***Case — integration in practice.*** *Corteva attributes recent crop-protection volume growth specifically to new products and biologicals; Syngenta runs an integrated biologicals arm (Syngenta Biologicals, built on the former Valagro); BASF launched glufosinate-P-ammonium in 2025 as a differentiated herbicide. Biologicals are being folded into conventional programmes, not run as a separate organic-only line.*

## 4 TARGETED DELIVERY

### The bottleneck is the label, not the drone.

Adoption is not theoretical. **DJI says** its global agricultural-drone fleet passed 600,000 units in 2026 (the company's own figure, announced at Agrishow Brazil — not an independent census), up from ~400,000 a year earlier. Industry estimates put China's crop-protection drone fleet well above 100,000 units as far back as 2021. In published field studies, targeted spot-spraying and AI-guided application have **reduced chemical use by ~15–30% and cut operator exposure**, with reported paybacks around two years on larger farms — though, in published case studies, results vary widely by crop and region. According to extension-service case studies, early US use concentrated on fungicide application on wheat and corn; China's largest use is rice.

What gates the West is not aircraft but **authorisation of products for aerial/drone application**:

- **Europe** [proposal — contested]: aerial spraying is restricted by default under Directive 2009/128/EC. The Commission has proposed easing this — its Food & Feed Safety Omnibus (COM(2025) 1021, Dec 2025) proposes an exemption pathway, and member states have moved (France's 2025 law for biocontrol/low-risk products on sloped terrain; Italy's Dec 2025 law; Spain's PDRA-S01) — but the EU-wide framework is not final, is politically contested, and even if adopted, each product still needs explicit drone authorisation under Regulation

1107/2009.

- **United States:** the EPA generally permits drone spraying only where the product is already labelled for aerial application; a dedicated, widely-adopted drone-specific label category is not yet established.
- **Asia leads on registration, not just hardware:** as of a 2023 review, Japan had ~390 products registered for drone application, South Korea ~200, and India 470+ (registry data, 2023). This is the clearest divergence between regions to date.

KEY FINDING

**The drone is largely a solved problem. The formulation registered for the drone is not. Whoever registers drone-ready, region-specific formulations first is positioned to own the precision-delivery channel — which is why themes one, two and three are a single strategy, not three trends.**

## 5 THE REGIONAL MAP

### Pain points, disruptions, risks.

**Europe — the paradox of a stalled mandate.** Pain point: active-ingredient attrition shifts and shrinks the toolbox faster than alternatives are approved, leaving some growers (steep vineyards, orchards, specialty crops) under-equipped. Disruption: the SUR collapse, the signalled pivot to biocontrol fast-tracking, and the proposed unwinding of the aerial-spray default. Risk: an ageing farm-manager base (Eurostat) raises the value of labour-saving precision tech, while policy whiplash makes long R&D; bets harder to underwrite.

**United States — regulatory whiplash and litigation.** The May 2025 initial MAHA report named glyphosate and atrazine; after intense industry and grower pushback, the September 2025 final report dropped specific restrictions and pivoted to voluntary action and precision-technology promotion. The lasting point is not the play-by-play but the outcome: **a high-profile political push produced no major new pesticide restrictions.** (The NCGA argued — according to its own modelling — that switching off these herbicides could raise costs ~60% and that unchecked pests could cut corn yields up to 70%.) Meanwhile the EPA is reforming approval for chemical and biologic products, reapproved dicamba, and launched a USDA–EPA partnership promoting targeted drone application, computer-assisted spray and robotic monitoring. Risk: the unresolved Roundup/glyphosate litigation overhang on Bayer, and tariff exposure on imported actives (input costs projected +4–6% into 2026), pushing dual-sourcing and reshoring.

**Asia — the real disruption sits here.** The evidence is anchored on harder data than trade press alone: per ICAMA (China's pesticide registration/customs authority), H1 2025 pesticide exports reached 2.24m tonnes (+17.5% year-on-year) worth US$8.5bn (+14%); and per the industry association CCPIA, sector revenue fell ~17% and profit ~62% in 2023 amid overcapacity. The interpretation — that Chinese producers are deliberately climbing from generic actives into **formulations, biologicals and patented compounds** — is supported by trade-press interviews and corroborated, from the other side, by the majors' own filings: Bayer, for instance, has stated a strategic focus on differentiating Crop Science from generic competitors. Policy: China's "anti-involution" drive aims to retire inefficient capacity, while an export-only registration regime (refined again in late 2025) loosens formulation rules for export. Counterweight: India is both a fast-growing demand market (27 new products approved in a single July 2025 sitting) and a rising producer; Japan and Korea lead on drone-product registration.

KEY FINDING

**The most underpriced risk to Western margins is not regulation — both Western crackdowns fizzled — but a Chinese industry that has decided to stop being a generic-active supplier and start being a formulation-and-biologicals competitor.**

## 6 OPPORTUNITIES AND A POSITIVE OUTLOOK

### A balanced read does not end on risk. The same forces open real ground.

- **Margin defence through formulation.** The formulation-and-registration layer is where price-war-resistant margin lives — an opportunity for any major with specialty-chemicals discipline.
- **Biologicals economics improving.** Ready-to-use stabilised formulations, nano-biopesticides (reported 15–21% better pest mortality in trials), and AI-triggered recommendation engines are turning fragile biologicals into field-robust, routine inputs.
- **Precision ROI is now demonstrable in case studies.** ~15–30% input reduction and ~2-year payback on larger farms; variable-rate and spot-spray cut waste while improving the compliance narrative — a rare win on cost and sustainability optics.
- **A lower-residue premium.** In several major retail chains (e.g. Aldi, Whole Foods), lower-residue and certified-sustainable sourcing programmes — applied differently by region rather than as a single global standard — create a price premium that rewards biocontrol-integrated programmes.
- **Partnership over confrontation with China.** The Chinese majors' move up-market is also a supply opportunity: differentiated co-development and tolling rather than pure price competition for actives that are commoditising anyway.

KEY FINDING

**Every pain point in §5 has a margin-positive mirror image for the player who controls formulation, registration, biologicals integration and the digital channel. The losers are undifferentiated active-ingredient sellers; the winners are integrators.**

## 7 THE PLATFORM MOAT

Of all the assets a major can hold, the one least exposed to a price war, a delisted active, or a regulatory reversal is the **digital relationship with the grower**. "Platformification" — Bayer's Climate FieldView, Corteva's Granular, Syngenta's Cropwise — is the quiet structural shift underneath the product-level noise, and it deserves more strategic weight than aerial-spray regulation.

The logic is straightforward. A molecule is sold once a season and is substitutable; a platform, once embedded in a grower's planning, agronomy and record-keeping, becomes the **system of record** through which decisions are made. It converts a transactional sale into a recurring, data-anchored relationship. Three properties make it defensible:

- **Switching cost.** Once field histories, prescriptions and compliance records live in a platform, moving to a competitor's tool means abandoning the data trail. Stickiness rises every season.
- **Data compounding.** Each season of field data improves the platform's recommendations, which deepens reliance — a flywheel a generic-active supplier cannot replicate.

- **Channel control.** The platform is also where advice is delivered, putting the major inside the grower's decision loop rather than upstream of the distributor.

Crucially, the platform is product-agnostic in a useful way: it can recommend and sell biologicals, conventional chemistry and precision-application services through the same interface — exactly the integrated-portfolio logic this paper keeps returning to. The molecule may turn over; the relationship need not.

KEY FINDING

**The molecule is the transaction; the platform is the relationship. For an integrated major, the stickiest asset of the next decade may not be any chemistry it owns but the agronomic platform it controls — and that is the contest least visible in the headline coverage.**

*[Flagged] The platform thesis is strategically strong but commercially unproven at scale: monetisation models for ag-data platforms remain mixed, and grower trust around data ownership is an open question. This is an argument about direction and defensibility, not about already-banked recurring revenue.*

## 8 COMMUNICATION

### Does it have to change when a major speaks to the farmer directly?

The short answer: the channels are changing faster than the substance, and the shift is real — but the hard data is thinner than the trend pieces suggest, so this section is deliberately cautious. Europe's farm-manager population is ageing (Eurostat), which paradoxically raises the value of both labour-saving technology and clear, trustworthy guidance through a generational handover. Where younger operators are taking over, information behaviour appears more **peer-led, video-first and platform-native**: short-form video, podcasts and messaging-group communities carry agronomic know-how, and credible practitioner-agronomists increasingly mediate trust.

The traditional B2B model — trial data, rep visits, distributor relationships — is not obsolete; it remains the backbone of high-value decisions. But it is increasingly insufficient alone. The emerging requirements: **peer proof** (other growers' results travel further than vendor claims); **format shift** (field-result video and short explainers, not only PDFs); **the platform as channel** (Cropwise-type tools become where advice is delivered — see §7); and **transparency** (residue, safety and sustainability questions now arrive from the farmer's own customers and family, not only from regulators).

KEY FINDING

**The message does not have to change; the proof does. Younger growers weight peer evidence and demonstrable field results over institutional claims, and expect them where they already are — on video, on phones, inside the platform.**

*[Flagged] Much published material on farmer media behaviour is content-marketing or platform-adjacent rather than peer-reviewed. The directional claim is well-attested; precise figures should be treated as indicative, and a commissioned survey would be the way to harden this for any specific market.*

## 9 SYNTHESIS: WHAT TO WATCH

### Three premises, three corrections, one through-line:

- The European phase-out is not the driver — **attrition and market pull are**, and Brussels is signalling de-risking of the alternative, not enacting a ban on the incumbent.
- The drone is not the breakthrough — **the registered, drone-ready, region-specific formulation is**.

- The biggest disruption is not a Western regulator — it is **a Chinese industry deciding to compete on formulation and biologicals**, not just price.

The through-line is the IMP thesis applied to agrochemistry: **value has migrated from the molecule to the interpretation of the molecule** — its formulation, its regional registration, its delivery system, its biological integration and its digital relationship with the grower. For an integrated major such as Syngenta, the strategic question is not which synthetics survive, but **how much of that interpretation layer it owns before a commoditising supply base and a fragmenting regulatory map decide for it.**

> ***Signature line.*** *Replace the question "which chemistry survives" with the question "who owns the formulation when it doesn't."*

### Claims to watch / not yet proven

KEY FINDING

**These underpin the argument but are not yet settled — the variables to track, and the points on which this paper should be updated: EU Biotech Act II (announced Q3 2026; agricultural scope unconfirmed); EU drone-spray reform (Omnibus proposed but contested; product authorisation under Reg 1107/2009 remains the gate); Chinese formulation registrations in Western markets (the up-market thesis depends on these clearing); biologicals field efficacy & shelf-stability (assumed to reach conventional-input reliability); and ag-platform monetisation (the §7 moat assumes durable, monetisable grower relationships, not yet proven at scale).**

## 10 SOURCES & METHODOLOGY

*Methodology: desk research on public sources only. Where market-size estimates diverge by scope, ranges are given and the most credible single figure identified. [Flagged] notes mark assumptions and data-quality limits. Regulatory items are tagged by status (binding law / proposal / non-binding target). Each source is tagged by confidence: [Official] regulator/legislature/primary text · [Filing] company results · [Market est.] market-research estimate · [Trade] trade press · [Content] content-marketing (directional only). Figures current to June 2026.*


1. MarketsandMarkets — Crop Protection Chemicals Market (US$83.32bn 2025; 5.0% CAGR) [Market est.]
2. Polaris Market Research — Crop Protection Chemicals Market (Apr 2026) [Market est.]
3. Grand View Research — Crop Protection Chemicals Market (narrow scope, ~US$50.2bn) [Market est.]
4. Mordor Intelligence — Global Crop Protection Chemicals/Pesticides Market (broad scope) [Market est.]
5. Grand View Research — Agrochemicals Market (incl. fertilizers; for contrast only) [Market est.]
6. FAO — Pesticides use and trade, 1990–2023, FAOSTAT Analytical Brief No. 109 (2025): 3.73 Mt active ingredients, 2023 [Official]
7. Towards Chem & Materials — Crop Protection Chemicals Market, formulated-product volume (Jan 2026) [Market est.]
8. MarketsandMarkets — Biopesticides Market 2025–2030 (US$8.94bn 2025; 14.6% CAGR) [Market est.]
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10. S. Lowder, J. Skoet & T. Raney / FAO — The Number, Size, and Distribution of Farms (World Development, 2016; FAO World Census of Agriculture): 570m+ farms; 475m+ under 2 ha [Official]
11. Revista Cultivar — Bayer announces 2025 results (Crop Science €21.62bn) [Trade]/[Filing]
12. Bayer Annual Report 2025 — Crop Science (EBITDA margin 19.4%; differentiation-vs-generics strategy) [Filing]
13. Syngenta Group — 2025 Full Year Results, 31 Mar 2026 (CP US$13.7bn; group US$28.4bn; EBITDA US$4.4bn) [Filing]
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15. Corteva — Full-Year 2025 Results (net sales US$17.40bn; CP ~US$7.5bn; op. EBITDA US$3.85bn), SEC 8-K [Filing]
16. BASF Report 2025 — Agricultural Solutions segment (€9.59bn) [Filing]
17. FMC Corporation — 2025 results & guidance (~US$4.0bn; India divestiture), SEC 8-K [Filing]
18. AgriBusiness Global / China Price Index (D. Li) — China supply outlook & formulation shift (2025) [Trade]
19. AgroPages — China agrochemical overview; Pilarquim/Pilarnano, CAC Nantong/cyproflanilide (2024–25) [Trade]

20. European Parliament — Legislative Train, Sustainable use of plant protection products (SUR withdrawn 6 May 2024, OJ) [Official]
21. European Commission — Pesticide reduction targets (50% targets now non-binding) [Official]
22. EUR-Lex — Commission Implementing Regulation (EU) 2023/2660 renewing glyphosate (to 15 Dec 2033) [Official]
23. European Commission — Food Safety: Glyphosate (approval to 15 Dec 2033; national restrictions; conditions) [Official]
24. Pestik — Pesticides in the EU 2026 (active-ingredient non-renewals: chlorpyrifos, mancozeb, neonicotinoids) [Trade]
25. European Commission — A Vision for Agriculture and Food (Feb 2025; intent to fast-track biocontrol) [Official]
26. Euronews — EU moves to fast-track biopesticide access (7–9-yr vs 2–3-yr approval) [Trade]
27. European Parliament — Legislative Train, European Biotech Act II (announced Q3 2026, wider biotech) [Official]
28. European Commission — Biotechnology / Biotech Act proposal COM(2025) 1022, 16 Dec 2025 (health-focused) [Official]
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31. DJI (via DroneXL reporting) — agricultural-drone fleet >600,000 (2026, DJI's own figure) [Trade]
32. market.us — Pesticide Spraying Drone Market (China 100,000+ by 2021; input savings; payback) [Market est.]
33. Ohio State University Extension (Ohioline/CFAES) — Drones for Spraying Pesticides (EPA/FAA label basis; US fungicide use; Japan ~390 / Korea ~200 / India 470+ products, 2023) [Official]/[Trade]
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35. DTN Progressive Farmer / AgFunderNews — Final MAHA report (Sep 2025) softens; precision/drone promotion [Trade]
36. CNN — Draft MAHA report treads lightly on pesticides (Aug 2025) [Trade]
37. NCGA — MAHA efforts on pesticides could cost farmers (~60% cost rise; up-to-70% yield loss — NCGA modelling) [Trade]
38. ICAMA (via AgriBusiness Global / UkrAgroConsult) — China H1 2025 pesticide exports 2.24 Mt (+17.5%), US$8.5bn (+14%) [Official]/[Trade]
39. CCPIA (via AgriBusiness Global / AgroPages) — China sector revenue −17%, profit −62% (2023); overcapacity [Trade]
40. AgriBusiness Global / Ministry of Agriculture and Rural Affairs (China) — export-only registration regime (refined 2025) [Trade]
41. Frontiers in Sustainable Food Systems — digital technologies & next-generation farmers (2025; peer-reviewed) [Market est.]
42. Farmonaut — agriculture social-media/influencer trends (2025–26) [Content] — directional only

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