

Precision Pest Management Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Technology (Monitoring and Spraying), By Solution (Hardware, Software, and Services), By Application (Area-Wide Pest Control and Site-Specific Pest Control), By Region and Competition, 2020-2030F

Market Report | 2025-09-30 | 185 pages | TechSci Research

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Report description:

Market Overview

Global Precision Pest Management Market was valued at USD 2.17 billion in 2024 and is expected to reach USD 5.22 billion by 2030 with a CAGR of 15.75% during the forecast period. The global market for Precision Pest Management is experiencing significant growth, driven by the rising demand for pesticide-free food owing to growing health-conscious population worldwide. Precision pest management is an advanced technology used in the agriculture field for monitoring crop production. Also, the growing adoption of internet of things devices in agricultural fields and substantial cost savings associated with precision pest management are expected to create lucrative opportunities for market growth during the forecast period. Also, enhancing the quality of crops and minimizing the negative impacts of pest control on resources will boost the growth of the market in the forecasted period.

Similarly, the growing demand for reduced potential environmental problems from pest management will enhance the growth of the market. This has led to a lot of new product launches for bringing about effective pest management. For instance, In October 2021, Yanmar launched the YV01 autonomous spraying robot, which was developed in cooperation with European vineyards. This is an autonomous spraying robot which can transform the way vineyards operate. This robot uses an advanced spraying system that helps in ensuring that the vines are precisely sprayed with the exact number of droplets which means fewer spraying fluids are required.

Key Market Drivers

Growing Food Security Needs

Governments are under pressure to secure reliable food supplies while cutting waste, which pushes rapid adoption of precision

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pest management (PPM) tools that use sensors, models, variable-rate applicators, and decision support to hit the right pest at the right time and dose. Public agencies repeatedly flag how large the problem is: the FAO estimates up to 40% of global crop production is lost to plant pests and diseases each year, costing the world over USD 220 billion (and ~USD 70 billion from invasive insects alone). These are precisely the losses PPM seeks to shrink through earlier detection (e.g., ground sensors, pheromone traps with machine vision), spatially targeted controls (UAV/drone maps to treat only hot spots), and resistance-aware rotations. At the same time, climate change is expanding pest ranges and volatility; the World Bank's climate-smart agriculture agenda specifically highlights the need to reduce vulnerability to droughts, pests, and diseases with data-driven practices, reinforcing public investment in surveillance and precision interventions. FAO and national plant-protection services also emphasize prevention-biosecurity, rapid identification, and containment-areas where digital scouting and analytics markedly raise success rates. As ministries of agriculture set yield-stability targets and food-price controls become politically salient, PPM delivers measurable, budget-friendly wins: fewer blanket sprays, lower residue risk, and steadier output. Expect continued deployment of risk maps, predictive phenology models, "spray-by-prescription" tools, and autonomous scouting robots as public programs seek demonstrable reductions in avoidable losses.

Key Market Challenges

Growing Escalating Resistance and Evidence Burden

PPM promises fewer chemicals used more intelligently, but resistance dynamics remain a stubborn headwind. Decades of broad-spectrum applications have selected resistant weeds, insects, and pathogens; regulators now require explicit resistance-management elements on labels and in stewardship programs. The U.S. EPA's resistance guidance underscores multi-element plans (rotation of modes of action, monitoring, education), yet operationalizing these plans at farm scale still hinges on reliable local data-trap counts, genotype/phenotype info, and treatment histories-which are often incomplete or siloed. In many regions, baseline monitoring infrastructure is thin, so vendors must build evidence networks field by field. Meanwhile, climate variability can trigger abrupt pest outbreaks or new incursions, forcing emergency use patterns that unintentionally accelerate resistance. Public agencies are pushing prevention and integrated pest management, but growers need decision tools that are trustworthy during fast-moving seasons; producing, validating, and updating those algorithms requires costly partnerships with extension services and national plant-protection organizations. Add the regulatory demand for documentation (who sprayed what, when, where, and why) and post-application verification, and the evidence burden for PPM providers rises. Without robust data pipelines (from remote sensing to ground truth) and clear economic incentives, some farmers default to calendar spraying, perpetuating the very resistance cycle PPM seeks to break. Taming resistance therefore depends not only on clever analytics, but also on public-private surveillance grids, shared data standards, and practical stewardship that growers can execute under real-world time pressure.

Key Market Trends

Digital Pest Intelligence: From Surveillance to "Spray by Exception"

National and international bodies are strengthening surveillance and early-warning systems, and growers are plugging into those feeds with field-level telemetry. FAO and IPPC initiatives emphasize prevention and rapid response; pairing that with on-farm IoT (spore traps, computer-vision traps, canopy sensors) and satellite/UAV imagery enables "spray by exception"-treating only verified hotspots at precisely timed windows. Governments' climate-smart programs prioritize resilience to pests and diseases, which has catalyzed funding for analytics platforms that fuse weather, pest phenology, and crop stage into actionable thresholds. As pesticide-use reduction metrics are reported annually (EU) and resistance-management plans become a regulatory norm (U.S.), platforms that automatically log scouting evidence, recommendations, and application maps help growers prove compliance while cutting inputs. Expect closer coupling of public extension advisories with farm software (API feeds of alerts), plus machine-learning models retrained on extension/inspection outcomes. Over the medium term, standardized data models and audit trails should make it easier for exporters to demonstrate due diligence to border inspectors, shortening time to market and lowering rejection risks. The direction is clear: more sensors, tighter feedback loops, and verified decisions that governments and buyers can trust.

Key Market Players

- PrecisionHawk, Inc.
- Deere & Company
- BASF SE

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- [] Topcon Precision Agriculture Pty. Ltd.

Report Scope:

In this report, the Global Precision Pest Management Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

- [] Precision Pest Management Market, By Technology:

- o Monitoring
- o Spraying

- [] Precision Pest Management Market, By Solution:

- o Hardware
- o Software
- o Services

- [] Precision Pest Management Market, By Application:

- o Area-Wide Pest Control
- o Site-Specific Pest Control

- [] Precision Pest Management Market, By Region:

- o North America
 - [] United States
 - [] Mexico
 - [] Canada
- o Europe
 - [] France
 - [] Germany
 - [] United Kingdom
 - [] Italy
 - [] Spain
- o Asia-Pacific
 - [] China
 - [] India
 - [] South Korea
 - [] Japan
 - [] Australia
- o South America
 - [] Brazil
 - [] Argentina
 - [] Colombia
- o Middle East and Africa
 - [] South Africa
 - [] Saudi Arabia
 - [] UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the Global Precision Pest Management Market.

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Available Customizations:

Global Precision Pest Management Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

-□ Detailed analysis and profiling of additional market players (up to five).

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