

Smart Pest Management System Market - Forecast from 2026 to 2031

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Abstracts

Smart Pest Management System Market, at a 6.85% CAGR, is expected to grow from USD 846.212 million in 2025 to USD 1259.164 million in 2031.

Smart pest management systems integrate IoT sensors, AI vision, acoustic detectors, pheromone traps, and cloud analytics to enable real-time, species-specific pest detection and automated intervention. Core platforms combine camera traps with edge-based convolutional neural networks (YOLOv8/v9, EfficientDet) for >95 % insect identification accuracy, delta traps with e-nose or optical counters, and soil/probe sensors for nematode and larvae monitoring. Data is aggregated into decision-support dashboards that trigger variable-rate biological or chemical applications only when economic thresholds are crossed.

Agriculture remains the largest and fastest-growing segment. Row crops (corn, soy, cotton), permanent crops (citrus, pome/stone fruit, nuts), and protected cultivation (greenhouses, vertical farms) now deploy autonomous scouting drones, fixed camera arrays, and robotic traps at scale. Leading systems reduce insecticide volumes 40–70 % versus calendar spraying while maintaining or improving yield through precise IPM timing. Semiochemical auto-dispensers for mating disruption (codling moth, grape berry moth, navel orangeworm) and UAV-based biocontrol release are moving from pilot to standard practice in high-value orchards.

Urban and structural pest control is the second major growth vector. Multi-unit dwellings, food-processing facilities, hospitality, and logistics warehouses increasingly specify connected rodenticides, camera-equipped insect light traps, and heat/CO₂ bed-bug systems that feed directly into service-technician routing platforms. Digital service models—subscription monitoring plus on-demand intervention—are achieving 30–50 %

higher margins than traditional route-based contracts.

Regulatory tailwinds are decisive. EU Farm-to-Fork and Sustainable Use of Pesticides Regulation revisions mandate IPM adoption and 50 % chemical reduction by 2031, effectively requiring digital monitoring for compliance documentation. Similar frameworks in California (DPR Roadmap), Canada (PMRA re-evaluations), and Brazil (MAPA low-impact programs) are creating enforceable demand for data-rich pest management records.

Key technology stacks have consolidated:

Vision + AI: Semios, Trapview, GreenTrapOnline, and iScout camera networks with >98 % species-level accuracy on major Lepidoptera, Hemiptera, and Coleoptera.

Acoustic + pheromone: Insect Eavesdropper and Russell IPM systems for stored-product beetles and date palm weevils.

Satellite + drone + ground sensor fusion: Bayer Crop Science Xarvio, BASF Smart Spraying, and John Deere See & Spray integration for threshold-based applications.

Residential and light-commercial adoption is accelerating through home-automation ecosystems. Smart bait stations and perimeter camera traps now integrate natively with Ring, Nest, and Arlo platforms, driving consumer recurring-revenue models.

Competitive dynamics favor vertically integrated players controlling sensor hardware, proprietary training datasets (often >10 million labeled insect images), and direct grower/technician relationships. Pure-software providers struggle against bundled hardware + service offerings from traditional crop-protection and pest-control operators who are rapidly digitizing routes.

In conclusion, the smart pest management market has entered an investment super-cycle driven by regulatory mandates for IPM documentation, labor shortages in scouting, and proven ROI from reduced chemical inputs. Systems delivering species-specific, geo-referenced, and auditable pest-pressure data at < \$15–25/ha/year (agriculture) or

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