Agricultural Pheromones Market Assessment, By Type [Sex Pheromones, Aggregation Pheromones, Alarm Pheromones, Trail Pheromones, Host Marking Pheromones], By Application [Trap, Dispenser, Spray], By Crop Type [Orchard Crops, Field Crops, Vegetables Crops, Others], By Region, Opportunities and Forecast, 2017-2031F

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Report description:

Global agricultural pheromones market is projected to witness a CAGR of 15.10% during the forecast period 2024-2031, growing from USD 4.04 billion in 2023 to USD 12.44 billion in 2031. The market is booming and is largely attributed to the growing emphasis on the use of sustainable pest control methods. As naturally occurring insect communication substances rise, pheromones are being employed in the control of pests through integrated pest management (IPM) practices, which are comparatively more environmentally friendly. Given all these restraints that chemical pesticides openly face due to environmental repercussions, pesticide resistance, and the health of consumers, pheromones have become a viable option for farmers. These chemicals are capable of causing disturbances within the mating processes of insects, keeping a check on the populations of pests, and ensuring the safety of the crops. Hence, their usefulness in organic and non-organic farming is immense.
The efficiency of several other delivery systems, such as microencapsulation and controlled-release systems, and their application across many crop kinds, is growing quickly, owing to the advancements in the technology of pheromone delivery devices. Government policies encouraging organic and environmentally friendly farming, especially in Europe and North America, are fueling the growth of the market. Farmers in Asia-Pacific and other emerging regions are adopting the same technology, as they, too, wish to increase crop productivity while using fewer chemical pesticides.
Potential challenges that could affect the dynamics include the high capital-intensive nature at the onset of its implementation, low levels of awareness, and the level of expertise required to handle pheromones hampering wide acceptance. However, the advancements in research and development, wider reach of distribution chains, and people becoming more receptive to green

solutions to pest control suggest that the agricultural pheromones market is set to grow at a consistent rate. This tendency emphasizes a transition to environmentally friendly farming practices and the importance of pheromones in the improvement of agricultural output worldwide.

In April 2024, FMC Corporation registered a range of pheromones with Brazilian regulatory bodies. By confusing the adults of the Spodoptera pest in large-scale crops, such as soybeans, corn, and cotton, the biological solution lowers the likelihood of insect reproduction. The product can be used with other agricultural products in a spray tank and has the potential to blend.

Rising Awareness of Integrated Pest Management (IPM) Catalyzes Market Expansion

The growing awareness of integrated pest management (IPM) is positively affecting the agricultural industry by encouraging sustainable and environmentally friendly pest control methods. IPM, however, goes beyond that as it incorporates biological, mechanical, and chemical approaches to controlling pests with the aim of reducing or eliminating environmental effects. There is a change in perception as the landscape changes, and the need to minimize the use of chemical-based pesticides is on the rise to avoid environmental degradation, pest resistance, and health concerns. Farmers are aware that IPM entails more than pest control as it even promotes maintenance of environmental balance, which, in turn, improves the quality and quantity of crops produced.

In IPM, pheromones are crucial as they are used for checking pest breeding, pest disruption, and controlling harmful insects while protecting organisms that are beneficial. With the increasing awareness of the long-term benefits of IPM, more farmers and agriculturalists are moving towards the adoption of pheromone-oriented strategies. The shift is forecasted to propel the growth of the agricultural pheromones market, which aligns with the overall shift toward sustainable agriculture.

In September 2024, Syngenta Crop Protection AG and Provivi, Inc. established a partnership to create and market pheromone-based biological solutions, Yellow Stem Borer (YSB) and Fall Armyworm (FAW), for the safer and more efficient management of pests that pose a threat to rice and corn. For the benefit of farmers, these product formulations, composed of biodegradable ingredients, mark noteworthy breakthroughs in terms of increased efficacy, longer duration, and improved environmental sustainability.

Concerns Over Pesticide Resistance to Fuel Market Growth

The issue of resistance towards pesticides, however, is of growing concern and has led to the search for other means of controlling pests. In due course, insects that are regularly subjected to chemical pest control measures acquire resistance, thus making such measures ineffective. As a result of this resistance, the crop yield and quality decrease, along with the level of chemical usage by farmers, which worsens the scenario. The practice of introducing pesticides into the environment has resulted in adverse impacts, such as soil and water pollution and health hazards for people and animals. Thus, the demand for environmentally friendly measures of controlling pests has increased.

As solutions to the problems associated with resistance to chemical pesticides, newer strategies utilizing pheromones have come into play. These compounds, unlike chemical agents, are specific for particular pest species and supervise pest populations to control their numbers without the risk of resistance development. In August 2023, HortiPro BV collaborated with EveryD Flowers to launch a new pheromone against whitefly. The pheromone is pipetted onto an absorbent material strip, which is subsequently placed into a dispenser with a hole for the pheromone to evaporate through inside. By placing the entire thing in a 14 mm hole in the sticky trap, the adult whiteflies are drawn to it. It directly leads to capturing a significant portion of the whitefly population.

Orchard Crops to Hold a Significant Market Share

The agricultural pheromones market is dominated by orchard crops as these crops are highly prone to insect infestation and, therefore, need effective pest control measures. These crops include fruits such as apples, peaches, cherries, and others, which are vulnerable to several pests that affect their yield and quality. There is a rising trend amongst farmers to use solutions that are based on pheromones as a replacement for chemical pesticides, for the purpose of protecting high-value crops in an environmentally friendly manner.

Pheromones specifically are essential in controlling pests, such as codling moths, midges, and borers, which often attack orchard crops. The implementation of the mating disruption techniques and pheromone traps assists in lowering the population of pests, helping in the production of cleaner and healthier fruits. Moreover, the increasing emphasis on organic and residue-free fruits and vegetables has contributed to the rising use of pheromones in orchards, enhancing their significance and expanding the growth of the global agricultural pheromones market.

In July 2024, Pherobank B.V. launched its latest pheromone to trap apple leaf midges, which put apple orchards at serious risk.

The insects can be trapped using funnel traps and delta traps. The product is created in readily usable lures for high-quality fruit production.

Asia-Pacific to Gain the Fastest Market Growth

Asia-Pacific is observed as the most dynamic market in terms of agricultural pheromones due to increasing agricultural activities and the need for effective pest management strategies. In countries such as China, India, and Indonesia, where the economies are growing rapidly, and populations are increasing, an increased demand for food production, necessitating the farmers to find very effective methods of reducing pest infestations, is witnessed. The increasing realization of the harmful impacts of chemical pesticides is pushing agricultural activities towards the use of pheromone-based integrated pest management (IPM) strategies.

In addition, the crop patterns in the region's agricultural land, which encompasses many crops, provide ample chances for the usage of pheromones. Moreover, government programs aimed at promoting sustainable agriculture to expand the market, which in turn motivates funding for research and development of pheromones technologies. In September 2024, in a joint research project, a sustainable pheromone dispenser with a controlled release rate was developed by scientists from India's ICAR–National Bureau of Agricultural Insect Resources (ICAR–NBAIR) and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR). This device may prove to be a creative way to significantly lower the expense of pest management and control.

Future Market Scenario (2024 – 2031F)

- The agricultural pheromones market is anticipated to grow at a rapid pace as an increasing number of farmers opt for sustainable methods of pest control in response to the growing consumer base that prefers organic and residue-free products.
- The increased governmental regulations aimed at promoting sustainable agricultural practices and decreasing the use of chemical pesticides will enhance the acceptability of the use of pheromones.
- Improved technologies for deploying pheromones, such as microencapsulation and targeted application systems, will increase the appeal and effectiveness of pheromones, thereby promoting their use in modern agriculture.

Key Players Landscape and Outlook

The global agricultural pheromones market is characterized by a diverse landscape of manufacturers focusing on sustainable crop protection methods. These players are actively engaged in research and development to enhance pheromone formulations, improving their efficiency in integrated pest management (IPM). In January 2023, Bayer AG collaborated with the French company M2i Life Sciences SA to provide pheromone-based biological crop protection products to fruit and vegetable growers globally. Under the agreement terms, Bayer became the sole distributor of specific M2i products that combat Lepidoptera pests in crops, such as tomatoes, grapes, stone fruits, and pome fruits. To provide growers with advice on pest pressures and application schedules, Bayer incorporated M2i's pheromone products into a complementary system of digitally enabled solutions. This system also contained additional synthetic and biological products that were specifically designed to meet the demands of growers.

As awareness of eco-friendly farming practices grows, there is a shift towards adopting pheromone-based solutions as alternatives to conventional chemical pesticides. This trend is driven by increased demand for organic produce and the need to address pest resistance issues.

The outlook for the market remains positive, with advancements in pheromone delivery technologies, such as microencapsulation and controlled-release mechanisms, expected to expand their applications across different crops. The evolving landscape suggests that the global agricultural pheromones market will continue to grow, supported by innovation and an increasing focus on environmentally friendly farming practices.

Table of Contents:

6.2.1.By Type
6.2.1.1.Sex Pheromones
6.2.1.2.Aggregation Pheromones
6.2.1.3.Alarm Pheromones
6.2.1.4.Trail Pheromones
6.2.1.5.Host Marking Pheromones
6.2.2.By Application
6.2.2.1.Trap
6.2.2.2.Dispenser
6.2.2.3.Spray
6.2.3.By Crop Type
6.2.3.1.Orchard Crops
6.2.3.2.Field Crops
6.2.3.3.Vegetable Crops
6.2.3.4.Others
6.2.4.By Country Share
6.2.4.1.United States
6.2.4.2.Canada
6.2.4.3.Mexico
6.3.Country Market Assessment
6.3.1.United States Agricultural Pheromones Market Outlook, 2017-2031F*
6.3.1.1.Market Size Analysis & Forecast
6.3.1.1.1.By Value
6.3.1.2.Market Share Analysis & Forecast
6.3.1.2.1.By Type
6.3.1.2.1.1.Sex Pheromones
6.3.1.2.1.2.Aggregation Pheromones
6.3.1.2.1.3.Alarm Pheromones
6.3.1.2.1.4.Trail Pheromones
6.3.1.2.1.5.Host Marking Pheromones
6.3.1.2.2.By Application
6.3.1.2.2.1.Trap
6.3.1.2.2.2.Dispenser
6.3.1.2.2.3.Spray
6.3.1.2.3.By Crop Type
6.3.1.2.3.1.Orchard Crops
6.3.1.2.3.2.Field Crops
6.3.1.2.3.3.Vegetable Crops
6.3.1.2.3.4.Others
6.3.2.Canada
6.3.3.Mexico
*All segments will be provided for all regions and countries covered
7.Europe Agricultural Pheromones Market Outlook, 2017-2031F
7.1.Germany
7.2.France
7.3.Italy
7.4.United Kingdom

*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

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