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Date: June 2, 2020

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

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(54) [Title of the Invention]

Pesticide Granules

(57) [Abstract]

[Problem]

To obtain easy-to-handle pesticide granules that prevent caking and experience very little dusting.

[Solution]

Provided are pesticide granules comprising a pesticide active ingredient and anhydrous silica having an average particle size of about 5 to 20 nm.

[Effect]

Because the pesticide granules of the present invention prevent caking during long-term storage and cause very little dusting during use, they are useful as easy-to-handle pesticide granules.

[Claims]

[Claim 1]

Pesticide granules comprising a pesticide active ingredient and anhydrous silica having an average particle size of about 5 to 20 nm.

[Claim 2]

Pesticide granules according to claim 1, wherein the pesticide granules are a granular water-soluble powder.

[Claim 3]

Pesticide granules according to claim 1, wherein the pesticide active ingredient is a water-soluble pesticide active ingredient having solubility in water at 20°C of about 0.1 g/ml or more.

[Claim 4]

Pesticide granules according to claim 1, wherein the pesticide active ingredient is acephate, nitenpyram, cartap hydrochloride, or validamycin A.

[Claim 5]

Pesticide granules according to claim 1, wherein the pesticide active ingredient is acephate.

[Claim 6]

Pesticide granules according to claim 1, wherein the amount of pesticide active ingredient is about from 10 to 95% by weight relative to the entire formulation.

[Claim 7]

Pesticide granules according to claim 1, wherein the amount of anhydrous silica is about from 0.1 to 3% by weight relative to the entire formulation.

[Claim 8]

Use of anhydrous silica to prevent caking of pesticide granules.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

The present invention relates to pesticide granules that prevent caking and experience very little dusting. The pesticide granules of the present invention prevent caking during long-term storage and cause very little dusting during use, and can be used as excellent pesticide granules for insecticidal, fungicidal, and herbicidal purposes.

[0002]

[Prior Art]

Calcium carbonate and high boiling-point solvents such as lactone and phenylxylylethane are used as anti-caking agents in the field of pesticides (JP S53-015425 A, JP S59-216801 A, JP S63-107903 A, etc.). A granular wettable powder comprising a pesticide active ingredient and diatomaceous earth is described in JP H06-128102 A. A solid pesticide formulation comprising a fired product of acephate and synthetic silicic acid is described in JP H07-002612 A. However, pesticide granules comprising anhydrous silica having an average particle size of about 5 to 20 nm and the use of anhydrous silica to prevent caking of pesticide granules is not described in the literature.

[0003]

[Problem to be Solved by the Invention]

Water-soluble powders of the prior art experience dusting when chemical agents are measured and liquid chemical agents are prepared. They are also difficult to measure due to poor fluidity. Granules experience caking during long-term storage. Liquids cannot be used with pesticide active ingredients that break down when dissolved in water. Liquids also have to be stored in solid containers such as glass bottles and plastic bottles. These containers are fragile and require a large amount of storage space. Disposal of used containers is also a problem from an environmental standpoint. It has been difficult to solve these problems with water-soluble powders and provide formulations that are easy to measure and that protect workers by not experiencing dusting. The major problem of disposing packaging containers for liquids also remains. Therefore, development of pesticide granules that do not experience dusting, that are easy to measure and handle, and that are easy to store is desired. Pesticide granules containing a water-soluble pesticide active ingredient also experience caking during long-term storage to pressure and humidity, and so measures that prevent caking are required.

[0004]

[Means for Solving the Problem]

After conducting extensive research in order to solve this problem, the present inventors unexpectedly discovered that pesticide granules that prevent caking and experience very little dusting could be obtained by combining a pesticide active ingredient with anhydrous silica having an average particle size of about 5 to 20 nm.

[0005]

Specifically, the present invention relates to (1) pesticide granules comprising a pesticide active ingredient and anhydrous silica having an average particle size of about 5 to 20 nm; (2) pesticide granules according to (1), wherein the pesticide granules are a granular water-soluble powder; (3) pesticide granules according to (1), wherein the pesticide active ingredient is a water-soluble pesticide active ingredient having solubility in water at 20°C of about 0.1 g/ml or more; (4) pesticide granules according to (1), wherein the pesticide active ingredient is acephate, nitenpyram, cartap hydrochloride, or validamycin A; (5) pesticide granules according to (1), wherein the pesticide active ingredient is acephate; (6) pesticide granules according to (1), wherein the amount of pesticide active ingredient is about from 10 to 95% by weight relative to the entire formulation; pesticide granules according to (1), wherein the amount of anhydrous silica is about from 0.1 to 3% by weight

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