INSECT RELEASE DEVICES

FIELD

[0001] The present application generally relates to devices to release insects into an environment.

BACKGROUND

[0002] All continents except Antarctica suffer from the plague of mosquito-vectored diseases. Various techniques for the control of mosquito populations involve the generation of sterile male insects for release into the wild for mating with local females. These techniques may employ systems for releasing the reared insects into the wild.

SUMMARY

[0003] Various examples are described for insect release devices. One example insect release device includes a vessel defining a volume, the vessel comprises first and second surfaces substantially opposite each other, the first surface defining an opening into the volume; a population of insect larvae or pupae or adult insects disposed within the volume; and a seal positioned to sufficiently obstruct the opening to prevent an adult insect from passing through the opening, the seal adhered to the first surface.

[0004] An aspect of the present invention provides an insect release device including a vessel defining a volume, wherein the vessel has a perimeter surface, and wherein the insect release device further comprises a plurality of fins extending from the perimeter surface; a population of insect larvae or pupae or adult insects disposed within the volume; wherein the vessel is permanently sealed, and wherein release of the insect larvae or pupae or adult insects occurs upon rupture of the vessel.

[0005] A further aspect of the present invention provides an insect release system including an insect release device comprising: a cylindrical tube defining a volume, the cylindrical tube having first and second ends; a population of insect larvae or pupae or adult insects disposed within the volume; a substantially conical end member coupled to and sealing the first end of the cylindrical tube, the substantially conical end member constructed of a material having a first thickness, the substantially conical end member defining a groove running around the edge of an inner or outer surface, the groove

creating a second thickness of the material thinner than the first thickness; and

an end member coupled to and sealing the second end of the cylindrical tube.

CLAIMS

That which is claimed is:

1. An insect release device comprising:

a vessel defining a volume, wherein the vessel has a perimeter surface, and wherein the insect release device further comprises a plurality of fins extending from the perimeter surface;

a population of insect larvae or pupae or adult insects disposed within the volume;

wherein the vessel is permanently sealed, and wherein release of the insect larvae or pupae or adult insects occurs upon rupture of the vessel.

2. The insect release device of claim 1, wherein water or insect food is disposed within the volume.

3. The insect release device of claim 1, further comprising a damp surface disposed within the volume.

4. The insect release device of claim 1, wherein the vessel comprises a biodegradable material configured to sufficiently decompose within less than substantially 50 hours to rupture the vessel.

5. The insect release device of claim 4, wherein the biodegradable material comprises one or more of (i) a cornstarch foam, (ii) one or more pectin capsules, (iii) paper, (iv) a mushroom-based foam, or (v) a plant-based plastic substitute.

6. The insect release device of claim 1, wherein each of the fins is oriented substantially perpendicular to a width of the perimeter surface.

7. An insect release system comprising:

an insect release device comprising:

a cylindrical tube defining a volume, the cylindrical tube having first and second ends;

a population of insect larvae or pupae or adult insects disposed within the volume;

a substantially conical end member coupled to and sealing the first end of the cylindrical tube, the substantially conical end member

constructed of a material having a first thickness, the substantially conical end member defining a groove running around the edge of an inner or outer surface, the groove creating a second thickness of the material thinner than the first thickness; and

an end member coupled to and sealing the second end of the cylindrical tube.

8. The insect release system of claim 7, wherein the groove is defined to structurally weaken the substantially conical end member.

9. The insect release system of claim 7, further comprising at least one fin coupled to the cylindrical tube, the at least one fin oriented along a longitudinal axis of the cylindrical tube.

10. The insect release system of claim 7, further comprising a launch device, the launch device comprising:

a pressurized air source comprising one or more of (i) a blower, (ii) a compressed air cartridge, or (iii) an ignition chamber and a propellant, and

a launch tube coupled to the pressurized air source and configured to receive pressurized air from the pressurized air source.

11. The insect release system of claim 10, the launch tube have a length greater than a length of the insect release device, and configured to receive the insect release device within the launch tube.

12. An insect release device comprising:

a vessel defining a volume;

a population of insects disposed within the volume; and

a gimbal mechanism coupled to the vessel, the gimbal configured to maintain a substantially constant orientation of the vessel.

13. The insect release device of claim 12, further comprising a parachute coupled to the gimbal mechanism.

14. The insect release device of claim 12, wherein the gimbal mechanism provides at least two rotational degrees of freedom.

15. The insect release device of claim 12, wherein the vessel further defines an opening in a surface of the vessel to expose the volume to an external environment, and wherein the gimbal mechanism is configured to maintain a substantially constant orientation of the vessel in a direction directed away from the earth.

16. The insect release device of claim 12, wherein the insect release device is at least partially constructed of a biodegradable material.

17. The insect release device of claim 16, wherein the biodegradable material comprises one or more of (i) a cornstarch foam, (ii) one or more pectin capsules, (iii) paper, (iv) a mushroom-based foam, or (v) a plant-based plastic substitute.