CLAIMS

What is claimed is:

1. An insect monitoring system comprising:
an insect attracting light;
an intake positioned adjacent the insect attracting light;
an exhaust;
an airflow ~~channel~~ conduit extending between the intake and ~~an end portion~~the exhaust;
~~an insect collecting net (ICN) positioned between the intake and the end portion of the channel;~~
a motorized fan for creating an airflow in the ~~channel~~ airflow conduit from ~~between~~ the intake ~~and the end portion~~to the exhaust;
a movable insect collecting mesh positioned in the airflow conduit between the intake and the exhaust, said movable insect collecting mesh being rotatively mounted in the airflow conduit to be movable from a first position for forcing the airflow through the movable insect collecting mesh and a second position for releasing insects to the exhaust;
a movable cleaning blade for scraping the insect collecting mesh when placed in the second position;
a digital camera positioned to capture images of the insect collecting mesh~~opposite an airflow side of the ICN~~; and
a controller operatively connected to each of the insect attracting light, the motorized fan, ~~and~~ the movable inset collecting mesh, the movable cleaning blade and the camera, the controller being operable to cause:
activation of the insect attracting light;
activation of the motorized fan such that insects attracted by the insect attracting light are drawn into the intake and airflow conduit by the airflow and trapped against the ~~ICN~~ movable insect collecting mesh when in the first position; ~~and~~
acquisition of ~~an~~ images ~~of the ICN~~ by the at least one digital camera; and
activation of the movable cleaning blade when the movable insect collecting mesh is in the second position.

~~2. The insect monitoring system of claim 1, wherein the end portion of the channel comprises an exhaust.~~

~~3.~~2. The insect monitoring system of claim 1 ~~or 2~~, wherein the controller is further operable to cause:
deactivation of the insect attracting light; and
deactivation of the motorized fan.

~~4.~~3. The insect monitoring system of claim ~~2~~ 1 or ~~3~~2, ~~further comprising~~wherein the movable insect collecting mesh is movable by a first servo motor operatively connected to the controller.~~:~~
~~a servo motor rotatively connected to the ICN; and wherein~~
~~the controller is further operable to cause activation of the servo motor to rotate the ICN to release insects via the exhaust.~~

~~5.~~4. The insect monitoring system of any one of claims 1 to ~~3~~4, wherein the movable cleaning blade is movable by a second servo motor operatively connected to the controller. ~~further comprising:~~
~~a further servo motor rotatively connected to a cleaning mechanism located adjacent to the ICN, the cleaning mechanism comprising at least one blade; and wherein~~

~~the controller is further operable to cause activation of the further servo motor to induce a rotative motion to the at least one blade.~~

~~6.~~5. The insect monitoring system of any one of claims 1 to ~~4~~5, further comprising:

a lighting array positioned adjacent the camera for illuminating the movable insect collecting mesh~~ICN~~; and wherein

the controller is further operable to cause activation of the lighting array in ~~the~~ an insect attraction mode, and deactivation of the lighting array in ~~the~~ a stand-by mode.

~~7. The insect monitoring system of any one of claims 1 to 6, wherein the insect attracting light comprises a set of light emitting diodes (LEDs).~~

~~8.~~6. The insect monitoring system of any one of claims 1 to ~~7~~5, wherein the insect attracting light is operable to emit light at a wavelength between 350 nm and 650 nm.

~~9.~~7. The insect monitoring system of any one of claims 1 to ~~8~~6, wherein the controller is operable ~~to cause each of the activation of the insect attracting light, the activation of the fan, and the acquisition of the image~~ according to a predetermined schedule.

~~10. The insect monitoring system of any one of claims 1 to 9, further comprising a power source connected to the controller.~~

~~11. The insect monitoring system of claim 10, wherein the power source comprises a solar panel.~~

~~12. The insect monitoring system of claim 10 or 11, wherein the power source comprises a battery~~

~~13.~~8. The insect monitoring system of any one of claims 1 to ~~12~~7, further comprising a communication module for transmitting and receiving data over a communication network.

~~14.~~9. The insect monitoring system of any one of claims 1 to ~~13~~8, further comprising:

a processor operatively connected to the camera, the processor having access to a machine learning algorithm (MLA) having been trained for insect recognition, the processor being configured for:

receiving the images acquired by the digital camera ~~of the ICN~~;

analyzing, using the MLA, the images to recognize a set of insects, each recognized insect being associated with an insect identifier indicative of a type of insect; and

outputting the set of recognized insects.

~~15.~~10. The insect monitoring system of claim ~~14~~9, wherein each recognized insect is associated with a prediction score indicative of a confidence of the MLA in recognizing the insect.

~~16.~~11. The insect monitoring system of claim ~~15~~10, wherein each recognized insect is associated with a bounding box indicative of an approximate location and size of the recognized insect in the image.

~~17.~~12. The insect monitoring system of claim 1~~5~~, wherein each recognized insect is associated with a mask at least partially indicative of pixels belonging to the recognized insect in the image.

~~18.~~13. The insect monitoring system of any one of claims ~~14~~9 to 1~~2~~7, wherein the outputting the set of recognized insects comprises outputting a number of each type of recognized insect.

~~19.~~14. The insect monitoring system of any one of claims ~~14~~9 to 1~~3~~8, wherein the MLA comprises a convolutional neural network (CNN) or a region proposal network (RPN).

~~20. The insect monitoring system of any one of claims 14 to 19, wherein the MLA comprises a region proposal network (RPN).~~

~~21.~~15. The insect monitoring system of any one of claims ~~14~~ 9 to ~~20~~14, further comprising:

determining, based on the set of recognized insects, a ratio of natural enemies in the set of recognized insects.

~~22.~~16. The insect monitoring system of any one of claims ~~14 to 21~~9 to 15, wherein

the insect monitoring system is connected to a database, preferably by a server; and wherein

the processor is further configured for:

querying the database based on the set of recognized insects to obtain insecticide recommendations.

~~23. A system comprising:~~

~~an insect monitoring system comprising:~~

~~an insect attracting light;~~

~~an intake positioned adjacent the insect attracting light;~~

~~a channel extending between the intake and an end portion;~~

~~an insect collecting net (ICN) positioned between the intake and the end portion;~~

~~a fan operable to create an airflow between the intake and the end portion to draw insects attracted by the insect attracting light into the intake and trap the insects against the ICN; and~~

~~a camera positioned opposite an airflow side of the ICN, the camera being operable to acquire images of the ICN; and~~

~~a server connected to the insect monitoring system, the server executing a machine learning algorithm (MLA) having been trained for insect recognition, the server being operable to:~~

~~receive an image of the ICN acquired by the camera;~~

~~analyzing, using the MLA, the image to recognize a set of insects, each recognized insect being associated with an insect identifier indicative of a type of insect; and~~

~~outputting the set of recognized insects~~

~~24. The system of claim 23, wherein the end portion of the channel comprises an exhaust.~~

~~25.~~17. The insect monitoring system of claim ~~24~~16, further comprising:

a client device connected to the server, the client device being operable to:

receive the set of recognized insects from the server.

~~26.~~18. The insect monitoring system of claim ~~25~~17, wherein the client device is connected to the insect monitoring system.

~~27.~~19. The insect monitoring system of any one of claims ~~24 to 26~~17 or 18, wherein the server is further configured for:

determining, based on the set of recognized insects, insecticide recommendations; and

transmitting the insecticide recommendations to the client device and providing an e-commerce application for sale of products and services responsive to the recommendations, preferably including a price and means for online ordering.

28.20. The insect monitoring system of claim 2719, wherein the transmitting the insecticide recommendations to the client device comprises transmitting an indication a recommendation of at least one an additional product or service available from the e-commerce application such as an agricultural nutrient, a replacement part for the insect monitoring system or a service call for servicing the insect monitoring system.

29. The system of claim 28, wherein the indication of the additional product comprises at least one of: an agricultural product, a food product, a component of the insect monitoring system, and a service.

30. The system of any one of claims 27 to 29, wherein

the server is further configured for, prior to determining the insecticide recommendations:

receiving currently used insecticides; and wherein

the determining the insecticide recommendations is further based on the currently used insecticides.

31. The system of any one of claim 27 to 30, wherein the insecticide recommendations comprises:

an insecticide type, and an associated insecticide quantity.

32. The system of any one of claim 27 to 31, wherein the insecticide recommendation further comprises:

an associated price.

33. A method of operating an insect monitoring system,

the insect monitoring system comprising:

an insect attracting light,

an intake positioned adjacent the insect attracting light,

a channel extending between the intake and an end portion;

an insect collecting net (ICN) positioned between the intake and the end portion;

a fan for creating an airflow between the intake and the end portion; and

a camera positioned opposite an airflow side of the ICN;

the method comprising:

activating the insect attracting light;

activating the fan such that insects attracted by the insect attracting light are drawn into the intake by the airflow and trapped against the ICN; and

activating the camera to capture an image of the ICN.

34. The method of claim 33, wherein the end portion of the channel comprises an exhaust.

35. The method of claim 34, wherein

the insect monitoring system further comprises a servo motor rotatively connected to the ICN; and wherein

the method further comprises:

activating the servo motor to rotate the ICN to release insects via the exhaust.

36. The method of any one of claims 33 to 35, wherein

the insect monitoring system is connected to a client device over a communication network; and wherein

the method further comprises:

transmitting, to the client device, the image of the ICN.

37. The method of any one of claims 33 to 36, further comprising:

deactivating the insect attracting light; and

deactivating the fan.

38. The method of any one of claims 33 to 37, wherein

the insect monitoring system comprises a controller operatively connected to each of the insect attracting light, the fan and the camera; and wherein

the method is executed by the controller.

39. A method for providing recommendations based on recognized insects in images, the method being executed by a processor, the processor having access to a machine learning algorithm (MLA) having been trained for insect recognition, the processor being connected to a database, the processor being connected to a client device, the method comprising:

receiving an image;

extracting a set of features from the image;

determining, based on the set of features, a set of recognized insects, each recognized insect being associated with an insect identifier associated with an insect type;

acquiring, from the database, based on the set of recognized insects, a set of recommendations;

acquiring from the database, a set of products; and

transmitting, to the client device, the set of recommendations and the set of products.

~~40. The method of claim 39, wherein the set of products comprises at least one of: an agricultural product, a food product, a component of the insect monitoring system, and a service.~~

~~41. The method of claim 39 or 40, wherein the set of recommendations includes insecticide recommendations.~~