CLAIMS

1. A method of screening insect pest genes to identify pest genes which can lead to mortality of the pest when expression of the pest gene is silenced in the pest, the method comprising:

(a) inserting a nucleic acid comprising a sequence of a first desired gene into a virus-induced gene silencing (VIGS) vector of a virus that can infect a desired plant host to produce a modified VIGS vector, wherein the first desired gene is an pest gene to be screened;

(b) inoculating the host with the modified VIGS vector to produce infected host;

(c) growing the infected host under conditions in which the modified VIGS vector is replicated to produce RNA which accumulates in tissue of the host;

(d) feeding the host tissue with RNA to pests; and

(e) determining whether the RNA is toxic to the pest,

wherein pest toxicity identifies the pest gene as an pest gene that leads to mortality of the pest when the pest gene expression is silenced in the pest, and wherein the pest genes are insect pest genes and the host is a plant host.

2. The method of claim 1, wherein the virus is a DNA virus or an RNA virus.

3. The method of claim 2, wherein the RNA virus is an RNA virus containing two RNA molecules and one of the RNA molecules is the VIGS vector.

4. The method of claim 3, wherein the RNA virus is tobacco rattle virus (TRV).

5. The method of claim 3, wherein the plant host is inoculated with the modified VIGS vector and a vector containing the other RNA molecule.

6. The method of any one of claims 1-5, wherein the host is a plant host and the host tissue is a plant leaf.

7. The method of any one of claims 1-6, wherein the nucleic acid further comprises a sequence of a second desired gene, wherein the second desired gene is a plant host resistance gene.

8. The method of claim 7, wherein the plant host resistance gene is selected from the group consisting of *RNase III Dicer-like 4* (*DCL4*) gene, *RNase III Dicer-like 2* (*DCL2*) gene, *RNase III Dicer-like 3* (*DCL3*) gene, *ARGONAUTE1* (*AGO1*), *ARGONAUTE71* (*AGO7*), *RNA-dependent RNA polymerase 1* (*RDR1*), *RNA-dependent RNA polymerase 6* (*RDR6*), *Suppressor of gene silencing 1* (*SGS1*), *Suppressor of gene silencing 3* (*SGS3*), and *Silencing defective 3* (*SDE3*).

9. The method of any one of claims 1-6, wherein the nucleic acid further comprises a sequence of a second desired gene, wherein the second desired gene is a pest small RNA biosynthesis gene, and wherein the pest gene is an insect pest gene.

10. The method of claim 9, wherein the pest small RNA biosynthesis gene is selected from the group consisting of *Dicer-1 (DCR1)* gene, *Pasha* gene, *Loquacious* gene (*Loqs*), *ARGONAUTE1* gene (*AGO1*), *ARGONAUTE2* gene (*AGO2*), *ARGONAUTE3* gene (*AGO3*), *Piwi* gene, *Stellate* gene and *Aubergine* gene *(Aub)*.

11. The method of any one of claims 1-10, wherein the RNA produced is dsRNA.

12. The method of claim 11, wherein the dsRNA is an siRNA or modified to form an siRNA.

13. The method of claim 12, wherein the nucleic acid is inserted into the vector as a hairpin structure.

14. The method of any one of claims 1-10, wherein the RNA produced is ssRNA.

15. The method of claim 14, wherein the nucleic acid is inserted into the vector in a sense orientation or an antisense orientation.

16. The method of any one of claims 1-15, wherein the sequence is selected from the group consisting of (a) a part of a 5' UTR of the first desired gene, (b) a part of a 3' UTR of the first desired gene, (c) a part of a coding sequence of the first desired gene, (d) a part of a 5' UTR of the first desired gene and a part of a coding sequence of the first desired gene and (e) a part of a coding sequence of the first desired gene and part of a 3' UTR of the first desired gene.

17. A method of controlling pests by viral expression of target pest sequences in a host to modify endogenous expression of pest genes in cells or tissues of the pest, the method comprising:

(a) inserting a nucleic acid comprising a sequence of a first desired gene to be silenced into a virus-induced gene silencing (VIGS) vector of a virus that can infect a desired host to produce a modified VIGS vector, wherein the first desired gene is an pest gene;

(b) inoculating the host with the modified VIGS vector to produce infected host; and

(c) growing the infected host under conditions in which the modified VIGS vector is replicated to produce RNA which accumulates in tissue of the host,

wherein the RNA causes gene silencing in the pest upon ingestion of the RNA produced in the host, whereby pests are controlled, and wherein the pest genes are insect pest genes and the host is a plant host.

18. The method of claim 17, wherein the virus is a DNA virus or an RNA virus.

19. The method of claim 18, wherein the RNA virus is an RNA virus containing two RNA molecules and one of the RNA molecules is the VIGS vector.

20. The method of claim 19, wherein the RNA virus is tobacco rattle virus (TRV).

21. The method of claim 19 or 20, wherein the plant host is inoculated with the modified VIGS vector and a vector containing the other RNA molecule.

22. The method of any one of claims 17-21, wherein the host is a plant and the host tissue is a plant leaf.

23. The method of any one of claims 17-22, wherein the nucleic acid further comprises a sequence of a second desired gene, wherein the second desired gene is a plant host resistance gene.

24. The method of claim 23, wherein the host resistance gene is selected from the group consisting of *RNase III Dicer-like 4* (*DCL4*) gene, *RNase III Dicer-like 2* (*DCL2*) gene, *RNase III Dicer-like 3* (*DCL3*) gene, *ARGONAUTE1* (*AGO1*), *ARGONAUTE71* (*AGO7*), *RNA-dependent RNA polymerase 1* (*RDR1*), *RNA-dependent RNA polymerase 6* (*RDR6*), *Suppressor of gene silencing 1* (*SGS1*), *Suppressor of gene silencing 3* (*SGS3*), and *Silencing defective 3* (*SDE3*).

25. The method of any one of claims 17-22, wherein the nucleic acid further comprises a sequence of a second desired gene, wherein the second desired gene is a pest small RNA biosynthesis gene, and wherein the pest gene is an insect pest gene.

26. The method of claim 25, wherein, the pest small RNA biosynthesis gene is selected from the group consisting of *Dicer-1 (DCR1)* gene, *Pasha* gene, *Loquacious* gene (*Loqs*), *ARGONAUTE1* gene (*AGO1*), *ARGONAUTE2* gene (*AGO2*), *ARGONAUTE3* gene (*AGO3*), *Piwi* gene, *Stellate* gene and *Aubergine* gene *(Aub)*.

27. The method of any one of claims 17-26, wherein the RNA produced is dsRNA.

28. The method of claim 27, wherein the ds RNA is an siRNA or modified to form an siRNA.

29. The method of claim 28, wherein the nucleic acid is inserted into the vector as a hairpin structure.

30. The method of any one of claims 17-29, wherein the RNA produced is ssRNA.

31. The method of claim 30, wherein the nucleic acid is inserted into the vector in a sense orientation or an antisense orientation.

32. The method of any one of claims 17-31, wherein the pest gene is selected from the group consisting of *gossypol-induced cytochrome P450 (CYP6AE14)*, *H^+-ATPase (V-ATPase)*, *glutathione-S-transferase (GST)*, *Dicer-1 (DCR1)*, *alpha-tubulin* and *chitin*.

33. The method of any one of claims 17-32, wherein the sequence is selected from the group consisting of (a) a part of a 5' UTR of the first desired gene, (b) a part of a 3' UTR of the first desired gene, (c) a part of a coding sequence of the first desired gene, (d) a part of a 5' UTR of the first desired gene and a part of a coding sequence of the first desired gene and (e) a part of a coding sequence of the first desired gene and part of a 3' UTR of the first desired gene.