Claims

1. An engineered insecticidal protein comprising the amino acid sequence as set forth in SEQ ID NO:44 or an insect inhibitory fragment thereof; wherein said insect inhibitory fragment comprises a valine in amino acid position 283 of SEQ ID NO:44, a serine in amino acid position 317 of SEQ ID NO:44, and a proline in amino acid position 369 of SEQ ID NO:44, and retains the insect inhibitory activity of SEQ ID NO:44.
2. The engineered insecticidal protein of claim 1, wherein the engineered insecticidal protein exhibits inhibitory activity against an insect species of the order Lepidoptera.
3. The engineered insecticidal protein of claim 2, wherein the Lepidoptera is selected from the group consisting of a *Spodoptera* and a *Helicoverpa*.
4. The engineered insecticidal protein of claim 2, wherein the Lepidoptera is selected from the group consisting of *Helicoverpa zea* and *Spodoptera frugiperda*.
5. The engineered insecticidal protein of claim 1, encoded by a polynucleotide operably linked to a heterologous promoter.
6. The polynucleotide of claim 5, wherein said polynucleotide comprises SEQ ID NO: 43.
7. A host cell comprising the engineered insecticidal protein of claim 1, wherein said engineered insecticidal protein is encoded by SEQ ID NO: 43 and wherein said host cell is selected from the group consisting of a bacterial host cell and a plant host cell.
8. The bacterial host cell of claim 7, wherein the bacterial host cell is selected from the group consisting of *Agrobacterium*, *Rhizobium*, *Bacillus*, *Brevibacillus*, *Escherichia*, *Pseudomonas*, *Klebsiella*, and *Erwinia*.
9. The plant host cell of claim 7, wherein said plant host cell is selected from the group of plants consisting of a monocot plant and a dicot plant.
10. An insect inhibitory composition comprising an insecticidally effective amount of the engineered insecticidal protein of claim 1.
11. The insect inhibitory composition of claim 10, wherein said composition further comprises at least one insect inhibitory agent different from the engineered insecticidal protein.

12. The insect inhibitory composition of claim 11, wherein the at least one insect inhibitory agent is selected from the group consisting of an insect inhibitory protein and an insect inhibitory dsRNA molecule.
13. The insect inhibitory composition of claim 12, wherein the at least one insect inhibitory agent exhibits activity against one or more pest species selected from the group of orders consisting of Lepidoptera, Coleoptera, Hemiptera, Homoptera, and Thysanoptera.
14. A seed comprising:

    a. the engineered insecticidal protein of claim 1; or

    b. the full length polynucleotide set forth in SEQ ID NO: 43, wherein said polynucleotide is operably linked to a heterologous promoter.

15. A transgenic plant or plant part comprising an insect inhibitory amount of the engineered insecticidal protein of claim 1, wherein said plant or plant part further comprises SEQ ID NO:43.
16. A commodity product, wherein said product comprises a detectable amount of the engineered insecticidal protein of claim 1 or a detectable amount of SEQ ID NO: 43.
17. The commodity product of claim 16, wherein said commodity product is selected from the group consisting of plant biomass, oil, meal, animal feed, flour, flakes, bran, lint, hulls, and processed seed.
18. A method comprising:

    c. planting at least one seed of claim 14;

    d. growing a plant from said seed; and

    e. harvesting progeny seed from said plant,

    wherein said harvested seed comprises said polynucleotide.

19. A method of controlling a Lepidopteran pest, said method comprising contacting a Lepidopteran pest with an inhibitory amount of the engineered insecticidal protein of claim 1.

20. A method of controlling a Lepidopteran pest, said method comprising exposing said pest to a transgenic plant or plant part, wherein said plant or plant part comprises a Lepidopteran inhibitory amount of said engineered insecticidal protein of claim 1.