KEY

A. (Identification 30 pts./ Justification 20 pts.) Identification:

a. Mystery Pest A = **Corn Earworm (10pts.)**

7pts. (Justification, should have most, if not all for full points):

- Readily mobile in a non-looping matter.
- Soft elongated body
- Smooth, rounded, hard head capsule
- Reduced eyes and antennae
- 3 pairs of segmented thoracic legs
- 5 pairs of fleshy abdominal prolegs
- Vary in color but are not spotted
- One pair of fleshy anal prolegs
- Segmented body
- Not rolling the host plant with silk strands
- Active during the day

b. Mystery Pest B = **Twospotted Spider Mite (10pts.)**

7pts. (Justification, should have most, if not all for full points):

- 1 mm or less in length
- 3 or 4 segmented thoracic legs
- No antenna, eyes, or wings
- Unsegemented body
- Visible to naked eye
- Affected plant is discolored but not distorted by feeding
- Plant has tiny chlorotic spots
- Some fine silk webbing

c. Mystery Pest C = **Green Bug (10pts.)**

6 pts. (Justification, should have most, if not all for full points):

- Tiny ~ 2 mm
- Beak like mouth
- Round, oval body
- Green in color
- Long slender legs
- Front wings have uniform texture
- Tube like cornicles on the abdomen that are pale and dark at tips

B. (Calculations 25 pts./ Justification 25 pts.) Damage-cost:

	Acres Effected	% of crop damaged
Pest A	628	18%
Pest B	385	34%
Pest C	243	47%

- Pest A **(Justifications = math shown = 6pts.)**

628 acres x 3.5 bushels =	2198	Bushels in Pest A's Area
2198 acres x .18 =	395.64	Bushels affected by Pest A
395.64 bushels x $4.32 =	$ 1,709.16	Damage cost for Pest A

Damage cost with new predicted estimates

$4.32 - ($4.32 x .023) =	$ 4.22	New Estimated Cost per Bushel
395.64 bushels x $4.22 =	$ 1,669.60	New Estimated Damage cost for Pest A **(calc6 pts.)**

- Pest B **(Justifications = math shown = 6pts.)**

385 acres x 3.5 bushels =	1347.50	Bushels in Pest B's Area
1347.50 acres x .34 =	458.15	Bushels affected by Pest B
458.15 bushels x $4.32 =	$ 1,979.21	Damage cost for Pest B

Damage cost with new predicted estimates

$4.32 - ($4.32 x .023) =	$ 4.22	New Estimated Cost per Bushel
458.15 bushels x $4.22 =	$ 1,933.39	New Estimated Damage cost for Pest B **(calc 6pts.)**

- Pest C **(Justifications = math shown = 6pts.)**

243 acres x 3.5 bushels =	850.50	Bushels in Pest C's Area
850.50 acres x .47 =	399.74	Bushels affected by Pest C
399.74 bushels x $4.32 =	$ 1,726.88	Damage cost for Pest C

Damage cost with new predicted estimates

$4.32 - ($4.32 x .023) =	$ 4.22	New Estimated Cost per Bushel
399.74 bushels x $4.22 =	$ 1, 686.90	New Estimated Damage cost for Pest C **(calc 6 pts.)**

- Grand Total **(Justifications = math shown = 7 pts.)**

$ 1,709.16 + $ 1,979.21+ $ 1,726.88= $ 5,415.25

Damage cost with new predicted estimates

$ 1,669.60+ $ 1,933.39 + $ 1,686.90 = **$ 5,289.89 (calc 7 pts.)**

C. (Calculations 20 pts./ Justifications 20 pts.) Biological control:

- Management Choice **(Calulations = if they show any type of work = 5pts.)**
  - For the Pest A you would use the parasitic wasp.
    - You would need 63 crates which cost **$1,338.12. (5 pts.)**
      - 628 acres / 10 acres = 62.8, so 63 crates
      - 63 crates x $21.24 = $1338.12
  - For Pest B you would use Minute Pirate Bug.
    - You would need 65 crates which would cost **$882.70. (5 pts.)**
      - 385 acres / 6 acres = 64.17, so 65 crates
      - 65 crates x $13.58 = $882.70
  - For Pest C you would use Lady Beetles.
    - You would need 31 Crates Which would cost **$495.38. (5 pts.)**
      - 243 acres / 8 acres = 30.38, so 31 creates
      - 31 crates x $15.98 = $495.38
- Pros Examples **(Justification, two or more should be provided, correct answer may not be shown = 10pts.)**
  - Specific strategy for that pest
  - Can lead to a more permanent control
  - More environmental friendly
  - Option for organic farmers
- Cons Examples **(Justification, two or more should be provided, correct answer may not be shown = 10pts.)**
  - Cost
  - Long start up time
  - Effectiveness may not be as good
  - Biodiversity Issues