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
      • Unsegmented 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:

<table>
<thead>
<tr>
<th></th>
<th>Acres Effected</th>
<th>% of crop damaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pest A</td>
<td>628</td>
<td>18%</td>
</tr>
<tr>
<td>Pest B</td>
<td>385</td>
<td>34%</td>
</tr>
<tr>
<td>Pest C</td>
<td>243</td>
<td>47%</td>
</tr>
</tbody>
</table>

- 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 *(calc 6 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 6 pts.)*

- 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 (Calculations = 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