PURPOSE
To stimulate the study of and interest in the science of growing, harvesting, storing, processing, and marketing of fruits, nuts, and vegetables through Agricultural Education curriculum.

OBJECTIVES
- To develop an understanding of the economic importance of the horticulture industry in the United States.
- Help develop an awareness of job opportunities for students who may be interested in careers in Olericulture and Pomology.
- Introduces quality standards and conditions for produce.
- Develops critical thinking skills and analytical skills through identification and judging quality of fruits and vegetables.
- Develop an understanding of cultural growing requirements for individual products and practices.
- Develop consumer awareness in purchasing produce.

COMMON CORE REFERENCES
7-8th Grade
MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*

9-10th Grade
CCSS.ELA-Literacy.RST.9-10.9 Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

11-12th Grade
CCSS.ELA-Literacy.SL.11-12.1d Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

EVENT FORMAT
A. Classes
There will be six classes of vegetables, fruits and nuts. Each class will have four plates of the vegetable, fruit or nut to be placed on quality and condition. The varieties to be judged will be selected from the identification list. One class will be designated as the oral reasons class by contest officials. Notes may not be used during oral reason presentations at State. Hand written notes may be used during oral reasons at invitational contests only.

NOTE: Samples will not be handled or touched.
B. Math Assessment and Solution

There will be 15 math assessment and solution questions. Each question will be worth 10 points. Suggested materials are not limited.

*All About Vegetables* West Edition

May be purchased at bookstores, a local nursery, or wherever Ortho Products are sold.

NMSU Circular # 483 - *Growing Grapes in New Mexico*

NMSU Circular # 461 - *Growing Pecans in New Mexico*

*Sunset Western Garden Book*, Latest Edition

Available at most bookstores.

NMSU Circular #457 Home Vegetable Gardening in New Mexico

http://aces.nmsu.edu/pubs/_circulars/CR457/

Delmar publishers "Mathmatical applications in Agruiculture"


NCCER Applied Construction Math (A Novel Approach)

Garden Math

http://gardenmath.blogspot.com/

Garden Math Useful Equivalents

http://pss.uvm.edu/pss123/equivtab.htm

C. Identification

The identification test will consist of two sets of 30 specimens from the identification list. Only marketable specimens will be used in the identification test. An identification sheet without variety names will be provided for each contestant. ID answers are to be placed on Form 14. Invitationals can do 1 of 30.

**TEAMS**

One team may enter per school. Each team will pay entry fees and all teams and individuals are eligible for awards.

**TEAM MEMBERS**

There may be four members to a team with the three highest individual total scores making the total for the team.

**EVENT SECTIONS AND POINTS POSSIBLE**

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<tr>
<th>Section</th>
<th>Points</th>
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<tbody>
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<td>Oral Reasons</td>
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<tr>
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<td>600</td>
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<td>Judging</td>
<td>300</td>
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<tr>
<td>Total</td>
<td>1100</td>
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<tr>
<td>Vegetables and Herbs</td>
<td>Fruits and Nuts</td>
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<tr>
<td>-----------------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Alfalfa Sprouts</td>
<td>105 Almond</td>
</tr>
<tr>
<td>2 Anise</td>
<td>106 Apple (Gala)</td>
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<tr>
<td>3 Artichoke (Globe)</td>
<td>107 Apple (Golden Delicious)</td>
</tr>
<tr>
<td>4 Asparagus</td>
<td>108 Apple (Granny Smith)</td>
</tr>
<tr>
<td>5 Basil</td>
<td>109 Apple (Red Delicious)</td>
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<tr>
<td>6 Bay Leaf</td>
<td>110 Apricot</td>
</tr>
<tr>
<td>7 Bean (Black)</td>
<td>111 Avocado</td>
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<tr>
<td>8 Bean (Kidney)</td>
<td>112 Banana</td>
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<tr>
<td>9 Bean (Lima)</td>
<td>113 Blackberry</td>
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<tr>
<td>10 Bean (Navy)</td>
<td>114 Blueberry</td>
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<tr>
<td>11 Bean (Pinto)</td>
<td>115 Brazil Nut</td>
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<tr>
<td>12 Bean (Red)</td>
<td>116 Cashew</td>
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<tr>
<td>13 Bean (Snap)</td>
<td>117 Cherry (any variety)</td>
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<tr>
<td>14 Bean Garbanzo</td>
<td>118 Chestnut</td>
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<tr>
<td>15 Bean Sprouts</td>
<td>119 Coconut</td>
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<tr>
<td>16 Beet</td>
<td>120 Craisin</td>
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<tr>
<td>17 Bell Pepper</td>
<td>121 Cranberry</td>
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<tr>
<td>18 Black-eyed Pea</td>
<td>122 Date</td>
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<tr>
<td>19 Bok Choy</td>
<td>123 Fig</td>
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<tr>
<td>20 Broccoli</td>
<td>124 Filbert</td>
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<tr>
<td>21 Broccoli Flower</td>
<td>125 Grape (any color)</td>
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<tr>
<td>22 Brussel Sprouts</td>
<td>126 Grapefruit</td>
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<tr>
<td>23 Cabbage</td>
<td>127 Guava</td>
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<tr>
<td>24 Carrot</td>
<td>128 Kiwi Fruit</td>
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<tr>
<td>25 Cauliflower</td>
<td>129 Kumquat</td>
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<tr>
<td>26 Celeriac</td>
<td>130 Lemon</td>
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<tr>
<td>27 Celery</td>
<td>131 Lime</td>
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<tr>
<td>28 Chayote</td>
<td>132 Macadamia Nut</td>
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<tr>
<td>29 Chinese Cabbage</td>
<td>133 Mandarin</td>
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<tr>
<td>30 Chives</td>
<td>134 Mango</td>
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<tr>
<td>31 Cilantro</td>
<td>135 Nectarine</td>
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<tr>
<td>32 Collards</td>
<td>136 Olive (any variety)</td>
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<tr>
<td>33 Cucumber</td>
<td>137 Orange (Naval)</td>
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<tr>
<td>34 Dill</td>
<td>138 Orange (Blood)</td>
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<tr>
<td>35 Eggplant</td>
<td>139 Papaya</td>
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<tr>
<td>36 Endive (Regular or French)</td>
<td>140 Peach (any variety)</td>
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<tr>
<td>37 Garlic</td>
<td>141 Peanut</td>
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<tr>
<td>38 Ginger Root</td>
<td>142 Pear (any variety)</td>
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<tr>
<td>39 Honeydew Melon</td>
<td>143 Pear (Asian)</td>
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<tr>
<td>40 Horseradish</td>
<td>144 Pecan</td>
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<td>41 Jicama</td>
<td>145 Pineapple</td>
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<td>42 Kale</td>
<td>146 Pinon Nut</td>
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<tr>
<td>43 Kohlrabi</td>
<td>147 Pistachio</td>
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<td>44 Leek</td>
<td>148 Plantain</td>
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<tr>
<td>45 Lettuce (Bibb)</td>
<td>149 Plum (any variety)</td>
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<tr>
<td>46 Lettuce (Head)</td>
<td>150 Pomegranate</td>
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<tr>
<td>47 Lettuce (Leaf)</td>
<td>151 Prune</td>
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<tr>
<td>48 Lettuce (Romaine)</td>
<td>152 Pumpkin Seeds</td>
</tr>
<tr>
<td>49 Mint</td>
<td>153 Raisin (any color)</td>
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<tr>
<td>50 Mushroom (Crimini)</td>
<td>154 Raspberry</td>
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<tr>
<td>51 Mushroom (Portabella)</td>
<td>155 Star Fruit</td>
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<tr>
<td>52 Mushroom (White)</td>
<td>156 Strawberry</td>
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<tr>
<td></td>
<td>157 Sunflower Seed</td>
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<td></td>
<td>158 Tangelo</td>
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<td></td>
<td>159 Walnut</td>
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<td></td>
<td>160 Watermelon</td>
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Sample Horticulture Produce Math Problems

1. Your anticipated Jalapeno yield is 10 tons per acre. Assuming you will have a 2% harvest/processing loss how many pounds of jalapenos would be marketed from a 3.5 acre farm?

2. Rhubarb crowns are planted at 2.5 feet intervals. How many crowns would you need for one garden row that is 96 feet long?

3. Beets require .21 inches of water per day. How many inches of water would be needed for the month of July?

4. Joe Greenhand harvested 1200 pounds of watermelons for the farmers market. A watermelon is 92% water. How many pounds of plant product is Joe actually transporting?

5. If there are 3,000 radish seeds to an ounce. How many seeds would be found in one pound?

6. Crucifer crops require pH above 6.8. You need to raise the pH of your 50 acre field. How many pounds of hydrated lime need to be applied. (application rate is 1500 lbs. per acre)

7. Commercial peas are grown at a rate of 400,000 plants per acre. How many plants could be grown on 4.25 acres?

8. Your 1 acre tomato patch requires 1.5 lbs. of seed. There are 9,000 seeds to the ounce. Assuming a 90% germination rate, how many plants can you expect.

9. Baby corn will yield 8,000 unhusked pounds per acre. Ninety percent of the weight is husks, silk etc., that will be removed. How many pounds of husked marketable product remain?
Judging is a matter of opinion should be on certain facts and standards. The standards of excellence should be adhered to in judging: it will lower the quality of products at a show or in the market.

In judging fruits and vegetables for show, remember three main parts:
1. Uniformity of size
2. Uniformity of shape
3. Uniformity of color

**Size** - Choose exhibits that are all the same size; they should be medium in size and not too large. They should be typical for the variety. Size is usually what the public would prefer to buy at the market.

**Shape** - Choose exhibits having the same shape and being typical for the variety.

**Color:** The specimens should have the same color or color markings, i.e., peaches with a red blush or the fruit should all have the same blush.

The materials to be judged should be:
1. True to type
2. Of good quality
3. In good condition - free of bruises, cuts, discoloration, etc.
4. At proper stage of maturity for eating
5. An example of cultural perfection
6. Free from pest damage
7. Clean

**Special Points to Consider in Selecting and Judging Vegetables:**

**Beans, green and wax**

**Merits:**
- Fresh color
- Uniform in length coloring and maturity
- Good shape for variety - generally straight but some varieties curve on
- Pod brittle, not wilted
- Fleshy and well filled with pulp from one end to other, but without beans being prominent
- Beans one-half mature
- Free from defects
- Can be shown with or without stems, but should be uniform

**Preparation:**
- Leave stems attached to pod

**Faults:**
- Tough
- Wilted
- Pale and discolored
- Evidence of insect and disease
- Knife marks on the pod
**Beets**
Merits: Uniform in size, color and shape  
Size from one and one-half to three and one-half inches in diameter  
Generally dark red with little russetting on crowns  
No cracks, new varieties including gold colored beet

Preparation: Cut off tops to approximately one inch

Faults: Color not within uniform, light streaks visible, damaged, cracked, pithy, wilted, too large and tough for eating

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**Broccoli**
Merits: Fresh green color  
Right stage of maturity for eating  
Flowers tightly budded without yellow showing, crisp  
Free from worms and aphids  
Stems should be under six inches long

Preparation: A few lower leaves may be trimmed off leaving no stubs

Faults: Small, loosely closed sprouts; yellowish color, wilted

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**Cabbage**
Merits: Heads solid and firm; salad types 5-8 inches in diameter  
Kraut types -8 inches in diameter  
Tender, crisp good weight for size  
Free from insect damage or disease  
Type is important as varieties differ in shape  
Shape may include: round, flat, pointed, red and savoy

Preparation: Outer leaves should be removed, leaving only the last few that curl at the tips (wrapper leaves)  
Cut stem one-fourth inch below lowest leaf

Faults: Poor color, loosely formed, wilted  
Disease or insect damage  
Incorrect size or shape

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**Carrots**
Merits: Type very important: Short (3-4"), Half Long (5-7"), and Long (8" and Diameter depending on variety  
Smooth, straight  
Pale to deep orange, depending on variety; each carrot same size and

Preparation: Cut tops off at approximately one inch

Faults: Off-colored, wilted, rough, cracked, insect damage, crooked or branched
### Cauliflower
**Merits:**
- Solid heads, good white color
- Smooth fine grained texture
- Crisp

**Preparation:**
Outer leaves trimmed evenly about one to two inches above center of head. Cut stem one-fourth inch below lowest leaf.

**Faults:**
- Wilted
- Yellow to brown color
- Rough, grainy texture (ricey)

### Cucumbers
(Listed under various classifications): Picking - one to three inches long; Slicing - six to eight inches long; and Gherkins (West India) - small pickling cucumbers that have burr-like fruit two to three inches long, one to one and one-half inches thick. Bright green skin with fleshy prickles.

**Merits:**
- Should be even in size, crisp

**Preparation:**
Leave one-fourth to one-half inch of stem attached

**Faults:**
- Light in color
- Not uniform in color and size
- Over mature
- Misshapen fruit

### Eggplant
**Merits:**
- Symmetrical and true to type 3-5 inches in diameter
- Firm, mature and uniform in color

**Preparation:**
Stems trimmed one to one and one-half inches
Do not wash, but wipe with a damp cloth

**Faults:**
- Wilted, misshapen
- Poor color, streaks in color of either green or white bruised spots

### Herbs
**Merits:**
- Fresh, uniform
- Clean leaves and stems

**Faults:**
- Dirty, diseased, insect damage, discolored, shriveled

### Kohlrabi
**Merits:**
- One and one-half inches to three inches in size; tender; even color

**Preparation:**
Trim leaves to about one inch of vegetable; trim off long roots
**Lettuce**

**Merits:**
- Firm, crisp, fresh
- Head in good condition

**Preparation:**
- Leave most of wrapper leaves in tact
- Best to remove few outer leaves after you get to show, as they protect the head
- Cut stem or butt with knife leaving one-fourth to one-half inch

**Faults:**
- Wilted, dry
- Shriveled, loose or bolting heads

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**Muskmelons or Cantaloupe**

**Merits:**
- Clean, firm
- Free from soft spots, scratches, decay
- Netting should be deeply ridged over entire melon
- Even, good color
- Determine ripeness by the "full slip" - vine should detach clean at attachment to melon

**Faults:**
- Over or under ripe
- Coarse netting
- Poor color, blemishes
- Too much yellow indicated over ripeness

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**Okra**

**Merits:**
- Uniform in size, shape, color and maturity
- Typical of variety
- Pods should be harvested when half grown, two to four inches long

**Preparation:**
- Trim stems one-half to one inch

**Faults:**
- Pods woody and fibrous

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**Onion**

**Merits:**
- **Green Onions** - one-half to one inch in diameter, showing no bulge
- Clear white color, dark green tops
- About six inches long, roots trimmed to one-half inch
- **Dry Onions** - Uniform in size, then neck
- Good color and shape for variety

**Preparation:**
- Cut tops leaving one to two inches on bulb; remove rootlets. Outer scale can be carefully removed, but if damage occurs in inner scales, it is scored down heavily.

**Faults:**
- Too many layers of skin removed, thick, soft neck, sunburned.
Pepper, Bell
Merits: Uniform, true to variety, firm, heavy, smooth, free from blemishes
       Stems should be attached; all specimens should have the same number of lobes or sections, varying from one to four, solid green color.
Faults: Dull, rough texture
       Off color, sunscald

Pepper, Chile
Merits: Uniform in size and shape
       Good color, firm
       Free from blossom-end rot
       Straight
       Stems attached
Faults: Discoloration
       Shriveling
       Immature
       Skin blemishes

Potato
Merits: Medium size (8 to 10 ounces), 3-6" long for Russet, 2-4" long plump, firm, smooth diameter for Red
Faults: Immature, blemishes
       Rough in shape, dirty
       Select for good uniformity, size and color
       Free from green color, sprouting and shriveling

Pumpkins & Squash
Pumpkins and squash are difficult to describe because of the great variations available on the market. The items for judging should be representative of the variety; all should have 1/2 to 3" stems to prevent leaking.

Pumpkins
Merits: Mature, smooth
       Evenly colored surface (green color indicates immaturity)
       Fruits may vary from round to oblong
       Surface is grooved
Preparation: Cut from stalk, leaving two to three inches of stem attached
Faults: Misshapen, immature fruit
### Summer Squash

**Merits:** Fruits small and tender enough to mark with fingernail; ideal length is six to eight inches, 1-2” in diameter

**Preparation:** Trim stems to one inch by cutting from vine

**Faults:** Fruits large and over-mature

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### Scallop Squash

**Merits:** Fruits small, three to six inches in diameter, with or without stems

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### Winter Squash

**Merit:** Uniform color  
Free from blemishes, insect and disease damage  
Fruit typical in shape and variety  
Fruits should be mature and the rind hard, not easily marked with

**Preparation:** Trim stem to one inch

**Faults:** Immature  
Insect and mechanical damage

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### Sweet Corn

**Merits:** Uniform in length, size and color according to variety, kernels full grown and in the milk stage

**Preparation:** Cut stems neatly below the point where the husks are attached  
If cut high, husks will fall and ruin appearance. Frequently silk is removed to tip of ear by pulling

**Faults:** Immature, unfilled grains, over-ripe and hard, uneven rows. Not filled to tips of ears, worm damage.

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### Tomato

**Merits:** Medium size, firm  
Color clear and typical of variety  
Clean, no growth cracks

**Preparation:** All with stems closely trimmed or all stems removed. Remove blossoms attached.

**Faults:** Coarse, over or under-ripe, bruised, soft cracks or corrugation  
Scarring
<table>
<thead>
<tr>
<th>Fruit</th>
<th>Merits</th>
<th>Preparation</th>
<th>Faults</th>
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</thead>
</table>
| **Watermelon** | Good weight for size  
Medium to large in size  
Bright intense green color or even striping over melon. Yellow rather than white spot where melon rested on the ground. Form even and regular without bulges or furrows. | Trim stem to one inch                           | Light in weight, uneven shape or color, blemishes  
Ground spot white                                           |
| **Apples**  | Specimens should be typical of the variety, uniform in size, color and maturity  
Free from insect, disease and mechanical damage  
Size medium to large, but size is not important factor. | Stems should be left attached; remove leaves and spurs | Not uniform, blemishes                                                                                     |
| **Grapes** | Typical of variety  
Berries should be uniform in size, color and maturity                  |                                                  |                                                                                                        |
| **Pears**   | Uniform in shape, size, color and maturity, typical of variety            | Leave stems attached                             |                                                                                                        |
| **Peaches** | Uniform in every respect with the ground color of the fruit yellow       | Stems of peaches need not be present, but should be uniform with or without stem  
Care in handling to prevent bruising is a must |                                                                                                        |
| **Plums**   | Uniform and typical of variety, fresh, plump and full color, free from damage  | Stems attached; do not remove natural bloom     |                                                                                                        |