# Cover Sheet: Request 13001

**HOS 4XXX C Principles of Postharvest Horticulture**

## Info

<table>
<thead>
<tr>
<th>Process</th>
<th>Course</th>
<th>New</th>
<th>Ugrad/Pro</th>
</tr>
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<tbody>
<tr>
<td>Status</td>
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<td></td>
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<tr>
<td>Submitter</td>
<td>Gerardo Nunez Villegas <a href="mailto:g.nunez@ufl.edu">g.nunez@ufl.edu</a></td>
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<td>We request to create a new course titled HOS 4XXX C – Principles of Postharvest Horticulture</td>
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## Actions

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<tr>
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<th>Status</th>
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<th>User</th>
<th>Comment</th>
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<td>Department</td>
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<td>CALS - Horticultural Sciences 514923000</td>
<td>Christine Chase</td>
<td>9/5/2018</td>
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<td>College</td>
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<td>CALS - College of Agricultural and Life Sciences</td>
<td>Joel H Brendemuhl</td>
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<td>9/21/2018</td>
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<td>9/24/2018</td>
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<td>11/13/2018</td>
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<td>Lee Morrison</td>
<td>Added to December agenda.</td>
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<td>PV - University Curriculum Committee (UCC)</td>
<td>Casey Griffith</td>
<td>Tabled until submitter has time to respond to UCC review subcommittee</td>
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</table>
Course|New for request 13001

Info

Request: HOS 4XXX C Principles of Postharvest Horticulture
Description of request: We request to create a new course titled HOS 4XXX C – Principles of Postharvest Horticulture
Submitter: Gerardo Nunez Villegas g.nunez@ufl.edu
Created: 10/30/2018 10:14:58 AM
Form version: 3

Responses
Recommended Prefix HOS
Course Level 4
Number XXX
Category of Instruction Advanced
Lab Code C
Course Title Principles of Postharvest Horticulture
Transcript Title Postharvest Hort
Degree Type Baccalaureate

Delivery Method(s) Online
Co-Listing No
Co-Listing Explanation Not applicable
Effective Term Earliest Available
Effective Year Earliest Available
Rotating Topic? No
Repeatable Credit? No

Amount of Credit 3

S/U Only? No
Contact Type Regularly Scheduled
Weekly Contact Hours 3

Course Description Biological principles involved in harvesting, grading, packaging, transportation, and marketing horticultural crops, and their effects on quality maintenance. Commercial postharvest practices explained in relation to general procedures and technologies as well as the recommended postharvest best handling practices and optimum postharvest conditions for different types of horticultural crops.

Prerequisites HOS4304
Co-requisites None

Rationale and Placement in Curriculum Horticulture does not end at harvest. Postharvest horticulture is an important aspect of horticultural production quality and efficiency. This course will be required in the Organic Horticultural Systems and Science and Technology of Horticultural Crops specializations (BS in Horticultural Sciences). Additionally, this course will be an elective in the Plant Biotechnology and Improvement specialization (BS in Horticultural Sciences).

Course Objectives Upon completion of the course, students will be prepared to,
1. Recognize the factors related to quality deterioration and wastage of horticultural commodities after harvest, including physiological, biochemical, and pathological considerations, as well as compositional and physical changes occurring during maturation and deterioration.
2. Relate commercial procedures for harvesting, preparation, packaging, transportation, and storage of horticultural crops to the biological principles and individual commodity requirements and responses.
3. Evaluate postharvest handling systems and recommend improved practices that will better maintain product quality during the postharvest period.

Course Textbook(s) and/or Other Assigned Reading No textbook is required for the course. However, the following supplemental reading sources may be helpful during this course.
• Postharvest: An Introduction to the Physiology and Handling of Fruit and Vegetables 6th
Weekly Schedule of Topics

Week 1
Introduction - Postharvest deterioration and losses
Morphology, structure, growth and development

Week 2
Composition of horticultural crops
Compositional changes during maturation & ripening

Week 3
Ethylene & other plant hormones - role in senescence
Ethylene and fruit ripening

Week 4
Respiration - introduction, measurement
Respiration - internal and environmental factors

Week 5
Transpiration & water loss
Physiological disorders

Week 6
Postharvest pathology - host-parasite interactions
Postharv. pathol. - environmental factors & control

Week 7
Maturity and quality standards
Food safety & quarantine treatments

Week 8
Harvesting, handling and packinghouse operations
Temp. management - cooling methods & principles

Week 9
Commercial storage; modified & controlled atmospheres
Transportation & the distribution system

Week 10
Subtropical fruits
Tropical fruits

Week 11
Small fruits
Pome & Stone fruits

Week 12
Vegetables – leafy & succulent
Vegetables – storage organs

Week 13
Vegetables – immature & mature fruits
Fresh-cut vegetables & fruits

Week 14
Cut flowers & potted plants

Week 15
Review and Final Exam

Links and Policies
COURSE POLICIES
Additional information on current UF grading policies for assigning grade points can be found here:
  • Grading policy, https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Attendance and Make-up Policy
Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
  • UF Attendance policy, https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Academic Honesty
As a student at the University of Florida, you have committed yourself to uphold the Honor Code,
which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action.

- For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code

Software Use
All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken when appropriate.

Services for Students with Disabilities
Students with disabilities requesting accommodations should first register with the Disability Resource Center by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

- Disability Resource Center, 0001 Reid Hall, (352) 392-8565, www.dso.ufl.edu/drc/

Campus Helping Resources
Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- Counseling and Wellness Center, 3190 Radio Road, 392-1575, www.counseling.ufl.edu
- Counseling Services

Groups and Workshops
Outreach and Consultation
Self-Help Library
Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu
- Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161.
- University Police Department, 392-1111 (or 9-1-1 for emergencies), www.police.ufl.edu

Additionally, if you would like orientation on choosing a major, finding an internship, or planning your career, I encourage you to use the university’s on-campus resources.

- Career Connections Center, CR-100 Reitz Union, 392-1601, https://career.ufl.edu/

Course Evaluation Process
Student assessment of instruction is an important part of the effort to improve teaching and learning. At the end of the semester, you are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at:

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Evaluations are typically open during the last two or three weeks of the semester. You will be notified of the specific times when evaluations for this course are open. Summary results of these assessments are available to students at:

- Evaluations summary, www.evaluations.ufl.edu/results
You can file and resolve any complaints about your experience in this course in the following site:
• Student complaints in online courses, http://distance.ufl.edu/student-complaint-process/

Grading Scheme
1. Midterm 1 100 points
2. Midterm 2 100 points
3. Final Exam 200 points
4. Laboratory reports 100 points
Total 500 points

Exams will be open book with 1 week to complete.
Students will conduct laboratory exercises during the semester and create PowerPoint reports for other students to view. Detailed instructions for the laboratory exercises will be distributed separately.

GRADING SCALE
A (4.0)
  = 470 - 500 points
A- (3.67)
  = 450 - <470 points
B+ (3.33)
  = 435 - <450 points
B (3.0)
  = 415 - <435 points
B- (2.67)
  = 400 - <415 points
C+ (2.33)
  = 385 - <400 points
C (2.0)
  = 365 - <385 points
C- (1.67)
  = 350 - <365 points
D+ (1.33)
  = 335 - <350 points
D (1.0)
  = 315 - <335 points
D- (0.67)
  = 300 - <315 points
E (0)
  =

< 300 points

Instructor(s) Jeffrey K. Brecht
Mark Ritenour
Dear colleagues in the CALS Curriculum Committee,

We request to create a new undergraduate course titled * Principles of Postharvest Horticulture*. This course will focus on biological phenomena that affect horticultural crops after harvest. While the title is shared with our existing graduate course (HOS 5085C), the graduate and undergraduate courses will not be co-listed. Each course, will have different pre-recorded lectures and assignments.

Please, do not hesitate to contact us if we can furnish you with additional information.

Sincerely,

Dr. Jeffrey K. Brecht

Dr. Mark Ritenour

Instructors – *Principles of Postharvest Horticulture*
HOS 4XXX C – Principles of Postharvest Horticulture

3 CREDITS

MEETING TIMES AND LOCATION

Students view web-based lecture and demonstration materials and participate in a weekly discussion session (day/time TBD) conducted either in-person or by videoconferencing according to student needs.

INSTRUCTORS

Dr. Jeffrey K. Brecht
1217 Fifield Hall
(352) 273-4778
jkbrecht@ufl.edu

Dr. Mark Ritenour
IRREC – Ft. Pierce
(772) 201-5548
ritenour@ufl.edu

Office hours Mondays 3:00PM- 5:00PM, but students are encouraged to contact instructors via e-mail or phone outside of office hours whenever questions are encountered.

PRE-REQUISITES

HOS 4304 – Horticultural Physiology

COURSE DESCRIPTION

Biological principles involved in harvesting, grading, packaging, transportation, and marketing horticultural crops, and their effects on quality maintenance. Commercial postharvest practices explained in relation to general procedures and technologies as well as the recommended postharvest best handling practices and optimum postharvest conditions for different types of horticultural crops.

LEARNING OBJECTIVES

Upon completion of the course, students will be prepared to,

1. Recognize the factors related to quality deterioration and wastage of horticultural commodities after harvest, including physiological, biochemical, and pathological considerations, as well as compositional and physical changes occurring during maturation and deterioration.
2. Relate commercial procedures for harvesting, preparation, packaging, transportation, and storage of horticultural crops to the biological principles and individual commodity requirements and responses.
3. Evaluate postharvest handling systems and recommend improved practices that will better maintain product quality during the postharvest period.
COURSE GRADE

1. Midterm 1 100 points
2. Midterm 2 100 points
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Total 500 points

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GRADING SCALE

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<tr>
<th>Grade</th>
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<td>B+</td>
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<td>B</td>
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<td>B-</td>
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<tr>
<td>C+</td>
<td>385 - &lt;400</td>
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<td>C</td>
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Grading policy: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

COURSE MATERIALS

TEXTBOOK

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# HOS4XXXC
## PRINCIPLES OF POSTHARVEST HORTICULTURE
### Course Schedule

<table>
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<th>Lec. #</th>
<th>Instr.</th>
<th>Lecture Topic</th>
<th>Supplemental Reading</th>
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<tr>
<td>1</td>
<td>MAR</td>
<td>Introduction - Postharvest deterioration and losses</td>
<td>Kader Ch. 4; Wills Ch. 1</td>
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<tr>
<td>2</td>
<td>JKB</td>
<td>Morphology, structure, growth and development</td>
<td>Wills Ch. 2</td>
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<td><strong>Discussion date #1:</strong> (Lec. 1-2) Date TBD - Week 1</td>
<td>Kays &amp; Paull Ch. 2</td>
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<td>3</td>
<td>JKB</td>
<td>Composition of horticultural crops</td>
<td>Florkowski Ch. 5</td>
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<tr>
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<td>JKB</td>
<td>Compositional changes during maturation &amp; ripening</td>
<td>Wills Ch. 3 &amp;</td>
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<td>5</td>
<td>JKB</td>
<td>Ethylene &amp; other plant hormones - role in senescence</td>
<td>Bartz &amp; Brecht Ch. 3</td>
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<td>6</td>
<td>JKB</td>
<td>Ethylene and fruit ripening</td>
<td>Bartz &amp; Brecht Ch. 10</td>
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<td><strong>Discussion date #3:</strong> (Lec. 5-6) Date TBD - Week 3</td>
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<td>7</td>
<td>MAR</td>
<td>Respiration - introduction, measurement</td>
<td>Bartz &amp; Brecht Ch. 2</td>
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<td>8</td>
<td>MAR</td>
<td>Respiration - internal and environmental factors</td>
<td>Kays &amp; Paull Ch. 3</td>
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<td><strong>Discussion date #4:</strong> (Lec. 7-8) Date TBD - Week 4</td>
<td>Kays &amp; Paull Ch. 4</td>
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<td>9</td>
<td>MAR</td>
<td>Transpiration &amp; water loss</td>
<td>Bartz &amp; Brecht Ch. 5</td>
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<td>10</td>
<td>JKB</td>
<td>Physiological disorders</td>
<td>Wills Ch. 8</td>
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<td><strong>Discussion date #5:</strong> (Lec. 9-10) Date TBD - Week 5</td>
<td>Bartz &amp; Brecht Ch. 19</td>
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<td><strong>MIDTERM EXAM</strong> - through physiological disorders (lectures 1-10)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bartz</td>
<td>Postharvest pathology - host-parasite interactions</td>
<td>Bartz &amp; Brecht Ch. 24</td>
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<tr>
<td>12</td>
<td>Bartz</td>
<td>Postharv. pathol. - environmental factors &amp; control</td>
<td>Bartz &amp; Brecht Ch. 20-23</td>
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<td></td>
<td><strong>Discussion date #6:</strong> (Lec. 11-12) Date TBD - Week 6</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>JKB</td>
<td>Maturity and quality standards</td>
<td>Florkowski Ch. 8 &amp; 14, Kader Ch. 6 &amp; 23</td>
</tr>
<tr>
<td>14</td>
<td>MAR</td>
<td>Food safety &amp; quarantine treatments</td>
<td>Kader Ch. 19 &amp; 24</td>
</tr>
</tbody>
</table>

Syllabus - 05
Discussion date #7: (Lec. 13-14) Date TBD - Week 7

15 MAR Harvesting, handling and packinghouse operations Bartz & Brecht Ch. 16
16 MAR Temp. management - cooling methods & principles Bartz & Brecht Ch. 8

Discussion date #8: (Lec. 15-16) Date TBD - Week 8  
Bartz & Brecht Ch. 9
Kader Ch. 11

17 JKB Commercial storage; modified & controlled atmospheres Wills Ch. 6&7
18 MAR Transportation & the distribution system Kader Ch. 20
Florkowski Ch. 16

Discussion date #9: (Lec. 17-18) Date TBD - Week 9

MIDTERM EXAM – Postharvest pathology through distribution and marketing (lectures 11-18)  
Posting date: Friday of Week 9; Due date: Friday of Week 10

III. COMMODITY REQUIREMENTS

19 MAR Subtropical fruits Kader Ch. 30
20 JKB Tropical fruits Kader Ch. 31

Discussion date #10: (Lec. 19-20) Date TBD - Week 10

21 MAR Small fruits Kader Ch. 29
22 JKB Pome & Stone fruits Kader Ch. 27-28

Discussion date #11: (Lec. 21-22) Date TBD - Week 11  
Kader Ch. 34

23 JKB Vegetables – leafy & succulent Bartz & Brecht Ch. 25
24 JKB Vegetables – storage organs Bartz & Brecht Ch. 26
Kader Ch. 35

Discussion date #12: (Lec. 23-24) Date TBD - Week 12  
Kader Ch. 33

25 JKB Vegetables – immature & mature fruits Bartz & Brecht Ch. 27-28
26 JKB Fresh-cut vegetables & fruits Bartz & Brecht Ch. 29
Kader Ch. 36

Discussion date #13: (Lec. 25-26) Date TBD - Week 13

27 MAR Cut flowers & potted plants Kader Ch. 25

Discussion date #14: (Lec. 27) Date TBD - Week 14
**Review Session:** 12/4. Final Exam distributed afterwards, due 1 week later.

**December X** – Last Day of Classes  
**Dec. X & Y** – Reading Days

**FINAL EXAM** – Cumulative (50%), but focusing on lectures 19–27 (50%)  
**Posting date:** Last class meeting; **Due date:** 1 week later
## HOS 4XXXC
### PRINCIPLES OF POSTHARVEST HORTICULTURE
#### Laboratory Schedule

<table>
<thead>
<tr>
<th>Lab. #</th>
<th>Periods</th>
<th>Laboratory Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1</td>
<td><strong>Introduction</strong> - tour of postharvest laboratory facilities; methods for measuring respiration and ethylene; quality evaluation systems.</td>
</tr>
<tr>
<td>2.</td>
<td>4</td>
<td>Factors affecting respiration, ethylene production and deterioration:</td>
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<tr>
<td></td>
<td></td>
<td>1. Commodity type</td>
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<tr>
<td></td>
<td></td>
<td>2. Time and temperature</td>
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<td></td>
<td></td>
<td>3. Modified/controlled atmospheres</td>
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<td></td>
<td></td>
<td>4. Ethylene</td>
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<td>5. Physical damage</td>
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<tr>
<td>3.</td>
<td>2</td>
<td>Factors affecting transpiration and water loss:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Water vapor pressure difference</td>
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<tr>
<td></td>
<td></td>
<td>2. Air velocity</td>
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<tr>
<td></td>
<td></td>
<td>3. Product surface to volume ratio and surface properties</td>
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<tr>
<td></td>
<td></td>
<td>4. Water vapor barriers (films and coatings)</td>
</tr>
<tr>
<td>4.</td>
<td>1</td>
<td>USDA grade standards</td>
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<tr>
<td>5.</td>
<td>2</td>
<td>Physiological disorders:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Low temperature (chilling) injury</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. High temperature injury</td>
</tr>
<tr>
<td>6.</td>
<td>2</td>
<td>Pathological considerations:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Physiological state of the commodity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Temperature and moisture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Surface barriers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Chemical control</td>
</tr>
<tr>
<td>7.</td>
<td>1</td>
<td>Field trip to observe harvesting, packinghouse, storage and transport operations.</td>
</tr>
<tr>
<td>8.</td>
<td>1</td>
<td>Field trip to a wholesale produce distribution center.</td>
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</tbody>
</table>