

AGRONOMY

Purpose

The Agronomy CDE is designed to motivate students to learn about crop production and factors that influence the quality of seed and forage crops.

Objectives

Students participating in the Agronomy CDE should develop the following skills and abilities:

- I. To identify weeds and crops by the seed or plant parts.
- II. To evaluate the quality of crop seed and hay samples for feeding, planting, or processing for food.
- III. To identify weeds as prohibited, noxious, or common, and length of life cycle.
- IV. To develop an understanding of the biological principles underlying production practices of major crops and of their handling for further marketing.

Crosswalk with Show-Me Standards

Objectives – Students participating in the Career Development Event should be able to:		Show-Me Standards	
		Knowledge Standards (Content Areas)	Performance Standards (Goals)
1.	To identify weeds and crops by the seed or plant parts.	SC.3, SC.4, SC.8	3.1
2.	To evaluate the quality of crop seed and hay samples for feeding, planting, or processing for food.		4.4, 4.8
3.	To identify weeds as prohibited, noxious, or common, and length of life cycle.		
4.	To develop an understanding of the biological principles underlying production practices of major crops and of their handling for further marketing.		

CORRESPONDING SECONDARY AGRICULTURE CURRICULUM			
Course and/or Curriculum:	Agricultural Science II Advance Crop Science	Unit(s):	Crop Science, Plant Science All Units

Event Format

The Agronomy CDE shall consist of the following three sections and seven components:

Section A. Identification – Two Hours

I. SEED IDENTIFICATION-- One Hour

- A. Contestants will identify 50 crops & weeds by seed samples from the Plant Identification List (Agronomy Reference 1).
- B. The life cycle for each seed will be identified as Winter Annual, Summer Annual, Biennial, or Perennial.
- C. Wheat and corn types are identified and distinguished in the seed category only.
- D. No more than one seed from any species.

II. PLANT IDENTIFICATION – One Hour

- A. Contestants will identify 50 crops & weeds by plant samples from the Plant Identification List (Agronomy Reference 1).
- B. The life cycle for each plant will be identified as Winter Annual, Summer Annual, Biennial, or Perennial.
- C. Wheat and corn types are identified and distinguished in the seed category only.
- D. No more than one plant from any species.

Section B. Judging and Disorders - One Hour

III. SEED JUDGING

1. Contestants will place one, four-sample class on its value as seed for marketing or planting. Either wheat OR soybeans will be the crop utilized in seed judging. Reasons will be given by checking the evaluation factors present in each sample.
Note: The CDE superintendent should place a minimum of 10 foreign seeds per plate. Seeds used in seed plates MUST be listed on the List of Seeds by Category for Seed Judging (Agronomy Reference 4) and should be realistic options .
Students should mark all factors present, regardless of number. All factors must be clearly observable and ample in quantity. Student Copy 2 and 3 will be used for seed judging. A 60-point scoring table will be used to score the students' placings of the samples.)
NOTE: A given sample may contain a maximum of two prohibited and/or two noxious and/or two common weed seeds.
2. The following will be considered judging factors in determining reasons for placing samples:
 - a. Freedom from mixtures (other varieties and other crops)
 - b. Freedom from inert material. (Includes stems, dirt, chaff, etc.)
 - c. Freedom from weed seeds (prohibited, noxious, common - see revised weed classifications, Part D under SUBJECT MATTER below)
 - d. Soundness (weathering, disease, immature seed, insect damage, sprouted kernels, etc.)

3. Factor values for each crop are provided on the following pages. Using these values, add the factor values for each sample as decided by sample condition. The sample with the lowest total factor value is the best sample.
4. Eight defects/factors will be used in each four-sample class.
5. Only seeds found on the identification list may be used. See Agronomy Reference 4 for their classification as noxious, prohibited, common weeds or crops.

IV. HAY JUDGING

Hay judging will cover alfalfa only. A four-sample class will be judged on the basis of final placing only. The student should be encouraged and taught to understand the quality factors used in judging hay. The quality factor breakdown should include leafiness (50%), color (25%), and foreign material (25%). These should be considered by the student and taught by the advisor to arrive at the final placing.

V. PLANT DISORDERS PRACTICUM

Ten samples will be identified according to category, causal agent and damage location. Refer to the Agronomic Disorders Practicum Scorecard (Student Copy 4) for the category, agent and damage location lists. Note: A Causal Agent may be used more than once, but not as an exact duplicate. Example: One soybean sample might exhibit anthracnose as a fungal agent; another soybean sample might exhibit brown stem rot as a fungal agent.

<u>Disorders</u>			
<u>Category:</u>	<i>Cultural</i>	<i>Biological</i>	<i>Environmental</i>
<i>Causal Agent:</i>	<i>Nutritional</i> <i>Chemical</i> <i>Mechanical</i> <i>Compaction</i>	<i>Fungus</i> <i>Nematodes</i> <i>Virus</i> <i>Bacteria</i> <i>Insect</i>	<i>Moisture</i> <i>Frost</i> <i>Wind</i> <i>Drought</i> <i>Hail</i> <i>Lightning</i> <i>Pollution</i> <i>Sun Scald</i> <i>Heat</i>
<i>Parts of Plant Displayed:</i>	<i>Reproductive</i> <i>Vegetative</i> <i>Vascular</i> <i>More Than One Area</i>		

VI. WRITTEN TEST

- A. A 50 question objective type test covering well established production practices and information contained in the references will be used. Hay analysis scenario questions may be included in the written test. No more than 5 questions will come from the Current Event Fact Sheet (Updated annually by the CDE Committee and Superintendent and published on DESE CDE Handbook Website)
- B. Biological principles underlying production practices of major crops will be emphasized to include the following: variety selection, propagation, life of plant (annual, biennial, and perennial), soil and climatic adaptation, cultural practices affecting crop growth and quality, disease resistance, insect relations, and principle uses. Problems on chemical application and seeding rate may also be included.
- C. Soil requirements and climatic adaptation and uses of miscellaneous crops will include tobacco, rice, winter vetch, millet, sunflower, and crown vetch.
- D. Questions over weeds will include classification, life of plant, propagation, and means of control. **Weeds to be covered are limited to the following from each class** (Missouri Plant Industries Seed Regulations 2 CSR 70-35.010 will be used as the official guide):
 1. Prohibited *--Field bindweed, Johnsongrass, musk thistle.
 2. Noxious ** --Black nightshade, buckhorn plantain, curly dock, giant foxtail, hedge bindweed, red sorrel, wild garlic/wild onion.
 3. Common--Barnyard grass, broomsedge, bull thistle, cheat/downy brome grass, chicory, climbing milkweed, cocklebur, common chickweed, common milkweed, common (broadleaf) plantain, common purslane, common ragweed, , daisy fleabane, dandelion, fall panicum, field pennycress, giant ragweed, goosegrass, henbit, horse nettle, horseweed/marestail, ironweed, jimson weed, lambsquarter, morning glory, oxeye daisy, Palmer Amaranth, Pennsylvania smartweed, pigweed, pokeberry, prickly lettuce, prickly sida, Serecia lespedeza, shepherd's purse, spotted knapweed, teaselvetleaf, wild carrot, wild mustard/yellow rocket, yellow foxtail, Yellow nutsedge, water hemp.

VII. PROBLEM SOLVING

A. Two (2) problem solving questions will be completed by the contestants. Each problem will have 10 questions valued at 5 points each for a total of 50 points. Problems will be included as part of the written test and must be from the following categories:

1. Fertilizer Calculations
2. Chemical Tank Mix
3. Hay Analysis
4. Grain Pricing

**Note: See Agronomy Appendix A - Practicum Examples on DESE CDE Webpage

Event Scoring

Event	Points Possible	Time
1. Seed Identification	200 Points	1 hour
	- 50 Crop & Weed Seed samples @ 3 points each	
	- Life cycle @ 1 pt each (see NOTE 1 below)	
2. Plant Identification	200 points	1 hour
	- 50 Crop & Weed Plant samples @ 3 points each	
	- Life cycle @ 1 pt each (see NOTE 1 below)	
3. Seed Judging	100 Points (see NOTE 2 below)	1 hour
	- One class of either Wheat or Soybean Seed Judging and Reasons	
4. Hay Judging	50 Points	
	- One Class of Alfalfa Hay	
5. Plant Disorders	50 Points	1 hour
	- Ten Disorders @ 5 points each	
IV. Test	250 Points	1 hour
	- 50 multiple choice questions @ 3 points each (150 pts)	
	- Two (2) problems @ 50 points each (100 pts)	
TOTAL	850 Points	4 hours

NOTE 1: The life cycle for each plant and/or seed will be identified as Winter Annual, Summer Annual, Biennial, or Perennial (1 point each). The scoring of the Agronomy CDE will be that the crop plant or seed ID and the weed plant or seed ID **MUST BE CORRECT** in order to receive points for the life cycle. Therefore if:

Sample identified correctly and life cycle correct = 4 points

Sample identified correctly and life cycle incorrect = 3 points

Sample identified incorrectly and life cycle correct = 0 points

NOTE 2: The seed judging class will be graded on the basis of 60 points for placings and 40 points for reasons. Eight defects/factors will be used in each four-sample class. Each defect/factor marked correctly will be worth five points. If any of the eight factors are not marked, five points will be deducted for each factor omitted. Two points will be deducted for each factor marked that should not have been marked.

Event Rules and Regulations

1. Contestants are not allowed to communicate with other contestants during the event.
2. Contestants will not be allowed to handle plant or weed samples. Contestants may bring and use a magnifying glass to view samples.
3. No instructor or student may obtain any plants, seeds, contaminants, or other materials from the CDE superintendent, Weed Science Unit, or Bradford Research Farm after **the last district contest** prior to state competition. (This includes workshops and district events which may be presented throughout the state). Questions, which would result in a competitive advantage for one or more schools, will not be answered prior to state competition.

Test References

Advanced Crop Science (Instructor Packet 10-1002-I) (2000), University of Missouri, Instructional Materials Laboratory, available <http://dese.mo.gov/college-career-readiness/career-education/agricultural-education/agricultural-education>

Plant Science Unit (Instructor Packet 10-1005-I). University of Missouri, Instructional Materials Laboratory, available <http://dese.mo.gov/college-career-readiness/career-education/agricultural-education/agricultural-education>

Preparing for the International Certified Crop Adviser Exam Manual. Available from International Plant Nutrition Institute, <http://www.ipni.net/>

Practicum References

MU Guides on Forages:

Forages for Cattle: New Methods of Determining Energy Content and Evaluating Heat Damage - G3150.

Understanding and Interpreting Feed Analysis Reports - G3160 (See Below)

Using NDF and ADF to Balance Diets - G3161

A guide to common forages and weeds of pastures M-169 Extension Publication

Purdue Extension

Corn and Soybean Field Guide

MX328: National Pesticide Applicator Certification Core Manual, Units 12. (a.k.a. the “White” book). Available at: DESE CDE Handbook Website <https://dese.mo.gov/college-career-readiness/career-education/agricultural-education/cde-handbook>

Weeds of the North Central States (1981). North Central Region Publication 281 and Circular 772, Illinois Agricultural Experiment Station, Urbana, IL, 303 pp.

Agronomy Appendix A - Practicum Examples - DESE CDE Website

National Pesticide Applicator Certification Core Manual (MX328), ***Appendix C – Conversions & Calculations AND pages 169-171 – Calculating Areas & Calculating Application Rates.***

Forms

See Plant Identification List (Agronomy Reference 1), Seed Wheat Judging Factors (Agronomy Reference 2), Seed Soybeans Judging Factors (Agronomy Reference 3), List of Seeds by Category for Seed Judging (Agronomy Reference 4), Plant Identification List (Student Copy 1), Student Copy 2, Student Copy 3, Student Copy 4.

PLANT IDENTIFICATION LIST

The following list will serve as the **official classification** in regards to **Winter Annual (WA), Summer Annual (SA), Biennial (B), Perennial (P)** for the Crop and Weed Plants & Seeds used in the Agronomy CDE:

00. Alfalfa	P	33. Forage Turnip (plant)	SA	67. Prickly lettuce	SA
01. Barley	WA	34. Giant foxtail	SA	68. Prickly sida	SA
02. Barnyard grass	SA	35. Giant ragweed	SA	69. Red clover	P
03. Bermuda grass	P	36. Grain sorghum	SA	70. Red sorrel	P
04. Big Bluestem	P	37. Green Beans	SA	71. Reed canary grass	P
05. Birdsfoot trefoil	P	38. Goose Grass	SA	72. Rice	SA
06. Black nightshade	SA	39. Hairy vetch	WA	73. Rye	WA
07. Broomsedge	P	40. Hard red winter wheat	WA	74. Serecia Lespedeza	P
08. Buckhorn plantain	P	41. Hedge bindweed	P	75. Shepherd's purse	WA
09. Buckwheat	SA	42. Henbit	WA	76. Smooth brome grass	P
10. Bull thistle	B	43. Horse nettle	P	77. Soft red winter wheat	WA
11. Cheat/Downy Bromegrass	WA	44. Horseweed/marestail	SA	78. Soybean	SA
12. Chicory	P	45. Indian grass	P	79. Spotted Knapweed	B
13. Climbing milkweed	P	46. Ironweed	P	80. Sunflower	SA
14. Cocklebur	SA	47. Jimson weed	SA	81. Sweet clover	B
15. Common chickweed	WA	48. Johnson grass	P	82. Sweet corn	SA
16. Common lespedeza	SA	49. Kentucky bluegrass	P	83. Switch grass	P
17. Common milkweed	P	50. Korean lespedeza	SA	84. Tall fescue	P
18. Common plantain	P	51. Lambsquarter	SA	85. Teasel	P
19. Common purslane	SA	52. Large crabgrass	SA	86. Tillage Radish (plant)	SA
20. Common ragweed	SA	53. Lohop clover	WA	87. Timothy	P
21. Corn (plant)	SA	54. Morning glory	SA	88. Tobacco	SA
22. Cotton	SA	55. Musk thistle	B	89. Velvetleaf	SA
23. Crown vetch	P	56. Oats	WA	90. Water Hemp (plant)	SA
24. Crimson Clover	SA	57. Orchard grass	P	91. Watermelon (plant)	SA
25. Cucumber (plant)	SA	58. Oxeye daisy	P	92. Wheat (plant)	WA
26. Curly Dock	P	59. Palmer Amaranth(plant)	SA	93. White clover	P
27. Daisy fleabane	SA	60. Pearl millet	SA	94. Wild carrot	B
28. Dandelion	P	61. Pennsylvania smartweed	SA	95. Wild garlic/onion	P
29. Eastern gamma grass	P	62. Perennial Ryegrass	P	96. Wild mustard/Yellow Rocket	WA
30. Fall panicum	SA	63. Pigweed	SA	97. Yellow corn	SA
31. Field bindweed	P	64. Pokeberry	P	98. Yellow foxtail	SA
32. Field Pennycress	WA	65. Popcorn	SA	99. Yellow Nutsedge (plant)	P
		66. Potato (plant)	SA		

SEED WHEAT JUDGING FACTORS

(Values allotted to subheads will not necessarily equal the values of main headings. The main headings represent the maximum for the factors.)

<u>Factor</u>	<u>(Deduction)</u>	<u>Maximum Deduction</u>
MIXTURES.....		30
Other varieties of wheat..... (10) (durum, white wheat, etc.)		
Other varieties of wheat within the..... (5) class (indicated by distinct differences in shape)		
Other crops (rye 15, vetch 15, (20) barley 10, oats 5, sunflower 5)		
INERT MATERIAL.....		5
Includes stems, dirt, chaff, etc (5)		
WEED SEED.....		40
Prohibited weeds* (40)		
Noxious weeds (25)		
Common weeds** (5)		
SOUNDNESS		25
Weathered or bleached (10)		
Sprouted..... (10)		
Immature (shrunken kernel) (5)		
Disease (scab, smut, or blacktip)..... (10)		
Mechanical damage (including heat damage)..... (5)		
Insect damage (5)		

100

*Any sample containing a prohibited weed will automatically be placed at the bottom of the four- sample class regardless of total numerical value associated with the sample.

** Serecia Lespedeza is classified as a common weed.

SEED SOYBEANS JUDGING FACTORS

(Values allotted to subheads will not necessarily equal the values of main headings. The main headings represent the maximum for the factors.)

<u>Factor</u>	<u>(Deduction)</u>	<u>Maximum Deduction</u>
MIXTURES.....		35
Other varieties	(20)	
Other crops (corn, sorghum, sunflower, etc.)	(25)	
INERT MATERIAL.....		5
Includes stems, dirt, chaff, etc	(5)	
WEED SEED.....		30
Prohibited weeds*	(30)	
Noxious weeds	(20)	
Common weeds** (morning glory, cocklebur - 15)	(10)	
SOUNDNESS		30
Weathered	(5)	
Immature (shrunken kernels).....	(10)	
Disease (purple spot, phomopsis, bleeding hilum) ...	(5)	
Mechanical damage (including heat damage)	(10)	
Insect damage	(5)	
		100

*Any sample containing a prohibited weed will automatically be placed at the bottom of the four- sample class regardless of total numerical value associated with the sample.

** Serecia Lespedeza is classified as a common weed.

List of Seeds by Category for Seed Judging

Crops	Prohibited Weeds	Common Weeds
Alfalfa	Field bindweed	Barnyard grass
Barley	Johnson grass	Broomsedge
Bermuda grass	Musk thistle	Bull thistle
Big Bluestem		Cheat/Downy Bromegrass
Birdsfoot trefoil		Chicory
Buckwheat		Climbing milkweed
Common lespedeza		Cocklebur
Corn (plant)	Noxious Weeds	Common chickweed
Cotton	Black nightshade	Common milkweed
Crimson Clover	Buckhorn plantain	Common plantain
Crown vetch	Curly Dock	Common purslane
Cucumber (plant)	Giant foxtail	Common ragweed
Eastern gamma grass	Hedge bindweed	Daisy fleabane
Forage Turnip	Red sorrel	Dandelion
Grain sorghum	Wild garlic/onion	Fall panicum
Green Beans		Field Pennycress
Hairy vetch		Giant ragweed
Hard red winter wheat		Goose Grass
Indian grass		Henbit
Kentucky bluegrass		Horse Nettle
Korean lespedeza		HorseweedMarestail
Lohop clover		Ironweed
Oats		Jimson weed
Orchard grass		Lambsquarter
Pearl millet		Large Crabgrass
Perennial Ryegrass		Morning Glory
Popcorn		Oxeye daisy
Potato (plant)		Palmer Amaranth
Red Clover		Pennsylvania smartweed
Reed canary grass		Pigweed
Rice		Pokeberry
Rye		Prickly lettuce
Smooth brome grass		Prickly sida
Soft red winter wheat		Serecia Lespedeza
Soybean		Shepherd's purse
Sunflower		Spotted Knapweed
Sweet clover		Teasel
Sweet corn		Velvetleaf
Switch grass		Water Hemp (plant)
Tall fescue		Wild carrot
Tillage Radish		Wild mustard/Yellow Rocket
Timothy		Yellow foxtail
Tobacco		Yellow Nutsedge (plant)
Watermelon (plant)		
Wheat (plant)		
White clover		
Yellow corn		

Plant Identification List

Student Copy 1

00. Alfalfa	33. Forage Turnip (plant)	67. Prickly lettuce
01. Barley	34. Giant foxtail	68. Prickly sida
02. Barnyard grass	35. Giant ragweed	69. Red clover
03. Bermuda grass	36. Grain sorghum	70. Red sorrel
04. Big Bluestem	37. Green Beans	71. Reed canary grass
05. Birdsfoot trefoil	38. Goose Grass	72. Rice
06. Black nightshade	39. Hairy vetch	73. Rye
07. Broomsedge	40. Hard red winter wheat	74. Serecia Lespedeza
08. Buckhorn plantain	41. Hedge bindweed	75. Shepherd's purse
09. Buckwheat	42. Henbit	76. Smooth brome grass
10. Bull thistle	43. Horse nettle	77. Soft red winter wheat
11. Cheat/Downy Bromegrass	44. Horseweed/marestail	78. Soybean
12. Chicory	45. Indian grass	79. Spotted Knapweed
13. Climbing milkweed	46. Ironweed	80. Sunflower
14. Cocklebur	47. Jimson weed	81. Sweet clover
15. Common chickweed	48. Johnson grass	82. Sweet corn
16. Common lespedeza	49. Kentucky bluegrass	83. Switch grass
17. Common milkweed	50. Korean lespedeza	84. Tall fescue
18. Common plantain	51. Lambsquarter	85. Teasel
19. Common purslane	52. Large crabgrass	86. Tillage Radish (plant)
20. Common ragweed	53. Lohop clover	87. Timothy
21. Corn (plant)	54. Morning glory	88. Tobacco
22. Cotton	55. Musk thistle	89. Velvetleaf
23. Crown vetch	56. Oats	90. Water Hemp (plant)
24. Crimson Clover	57. Orchard grass	91. Watermelon (plant)
25. Cucumber (plant)	58. Oxeye daisy	92. Wheat (plant)
26. Curly Dock	59. Palmer Amaranth(plant)	93. White clover
27. Daisy fleabane	60. Pearl millet	94. Wild carrot
28. Dandelion	61. Pennsylvania smartweed	95. Wild garlic/onion
29. Eastern gamma grass	62. Perennial Ryegrass	96. Wild mustard/Yellow Rocket
30. Fall panicum	63. Pigweed	97. Yellow corn
31. Field bindweed	64. Pokeberry	98. Yellow foxtail
32. Field Pennycress	65. Popcorn	99. Yellow Nutsedge (plant)
	66. Potato (plant)	

Seed Wheat Judging Estimating the Value of Planting Seed

Student Copy 2

Name: _____ Contestant Number: _____

School: _____ School Number: _____

FINAL PLACING			
1 ST	2 ND	3 RD	4 TH

(FOR JUDGES USE ONLY)	
Placing Score	
Reasons Score	
FINAL SCORE	

		1	2	3	4		Judges Negative Deductions
		Place an X or blacken in boxes where you feel the 8 evaluation factors are found					
Mixture (maximum deduction - 30)	Other Varieties						
	Other Crops						
Inert Material (maximum deduction - 5)	Chaff, dirt, etc.						
Weed Seed (maximum deduction - 40)	Prohibited	1 st					
		2 nd					
	Noxious	1 st					
		2 nd					
	Common	1 st					
		2 nd					
Soundness (maximum deduction - 25)	Weathered						
	Sprouted						
	Immature						
	Disease						
	Mechanical Damage (including Heat)						
	Insect Damage						

Soybean Judging Estimating the Value of Planting Seed

Student Copy 3

Name: _____ Contestant Number: _____

School: _____ School Number: _____

FINAL PLACING			
1ST	2ND	3RD	4TH

(FOR JUDGES USE ONLY)	
Placing Score	
Reasons Score	
FINAL SCORE	

						Judges Negative Deductions
		1	2	3	4	
EVALUATION FACTORS		Place an X or blacken in boxes where you feel the 8 evaluation factors are found				
Mixture (maximum deduction - 35)	Other Varieties					
	Other Crops					
Inert Material (maximum deduction - 5)	Chaff, dirt, etc.					
Weed Seed (maximum deduction - 30)	Prohibited	1 st				
		2 nd				
	Noxious	1 st				
		2 nd				
	Common	1 st				
		2 nd				
Soundness (maximum deduction - 30)	Weathered					
	Immature					
	Disease					
	Mechanical Damage (including Heat Damage)					
	Insect Damage					

AGRONOMIC DISORDERS PRACTICUM SCORECARD

Student Copy 4

Name: _____ Contestant Number: _____

School: _____ School Number: _____

		Possible		
		Answer	Points	Score
1.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
2.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
3.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
4.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
5.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
6.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
7.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
8.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
9.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
10.	Causal Category:		2	
	Agent:		2	
	Part of Plant Displayed:		1	
Total Score			50	

Possible Answers	
Causal Category:	
A.	Biological
B.	Cultural
C.	Environmental
Agents:	
01	Bacteria
02	Chemical
03	Compaction
04	Drought
05	Frost Damage
06	Fungus
07	Hail
08	Heat
09	Insect
10	Lightning
11	Mechanical
12	Moisture
13	Nematodes
14	Nutritional
15	Pollution
16	Sun scald
17	Virus
18	Wind damage
Parts of Plant Displayed:	
A.	Reproductive parts
B.	Vegetative parts
C.	Vascular Bundles
D.	More than one