

1. This CDE shall consist of four (forty-five minute) rotations having a total score of 860 points.

A. Problem Solving	100 points	Split time with exam and practicums
B. Exam	300 points	45 minutes (50 questions @ 6 pts each)
C. Plant Equipment/Pest Identification	350 points	45 minutes (50 samples @ 7 pts each)
D. Practicums (2)	<u>100 points</u>	45 minutes
	Total	850 points

A. Problem Solving (100 points): 10-20 multiple-choice questions dealing with a given scenario at 5-10 points per question. No more than two questions will be from any of the following areas. Not all areas will be used each year.

- Plant disorders and pest treatments
- Landscape design or plant selection
- Retail Pricing given wholesale information
- Nursery plant production schedule
- Determine equipment specifications, demonstrate pre-check operations.
- Lawn care procedures and equipment operation.
- Chemical handling procedures, e.g., fertilizer or pesticide equipment calibration and application.
- Preparing service receipts.
- Plant material quality assessment.
- Pruning maintenance.
- Safety practices.

Questions may use bare root, container grown, balled and burlapped nursery stock or landscape plans.

One or two Judging Classes (50 points each) could be used instead of problem solving questions.

B. Information and Skills Exam (300 points): 50 objective type questions and specimens for analysis will be selected from the following areas: (6 points/question)

1. Nursery, landscape, gardening industry
2. Plant science
3. Soils & fertilization
4. Plant propagation
5. Landscape design
6. Plant materials
7. Nursery practices
8. Landscape practices
9. Turf & grounds maintenance

C. Plant/Equipment/Pest Identification (350 points): Composed of 50 specimens and/or samples selected from the following areas: (each specimen valued at 7 points):

**I. Plant ID (34 specimens)**

1. Annuals
2. Deciduous Shrubs
3. Deciduous Trees
4. Evergreen Shrubs
5. Evergreen Trees
6. Other plants-Bulbs, Grasses & Vines
7. Perennials

**II. Equipment/Pest ID (16 specimens)**

1. Equipment and Supplies
2. Beneficial Insects
3. Pests
4. Plant Diseases
5. Physiological Problems
6. Weeds

D. Practicums (100 points): Two practicums will be selected from the following areas:

- 2018 Determine necessary soil amounts for potting.
- 2018 Calculate needed material for patio and sidewalks using pavers and keystone system.
- 2019 Determine materials for retaining wall
- 2019 Pruning nursery stock.
- 2020 Determining material for planting a bed or hedge.
- 2020 Establish a lawn by seeding or sodding.
- 2021 Volume and area for different plots.
- 2021 Estimate materials for a given landscape plan, use of architects scale.

2. Four members constitute a team at the MN FFA Convention. The top three scores will be used to determine the team score.
3. Official Dress or appropriate FFA attire is required. Refer to Rule 1-A-5 on page 1.1.
4. Time: Contestants shall receive 45 minutes to complete each part of the CDE.
5. References: A suggested reference list is included but similar titled references will provide the needed information.
6. Computer scan sheets will be used for this CDE. A sample of the scantron is on the CDE Rules Page
7. Objective questions and specimens for analysis will be developed each year prior to the State FFA Convention by individuals conducting the CDE.
8. Samples may include items, pictures, leaves, twigs, or entire plants. When trees and shrubs are in a dormant or bud stage, leaf samples may be included with the plant or twig. Potted samples should be provided when practical. A picture may be used to supplement the samples.
9. Example practicums are listed on the Minnesota FFA Website.
10. Tiebreakers- If team or individual scores are tied when scores are tabulated, ties will be broken in the following order: Total Identification score, then written exam score, then total practicum score, and finally problem solving score.

### **Knowledge List**

1. Problem solving: The questions will be based on Knowledge or specimens selected from the exam topics or the identification lists below.
2. Information and Skills Exam: 50 objective type questions and specimens for analysis will be selected from the following areas:
  - a. Nursery, landscape, & gardening industry
    - geographical location
    - occupations/opportunities
    - industry scope
  - b. Plant science
    - classification
    - plant parts
    - plant growth principles

- c. Soils and fertilization
  - soil texture and structure
  - water holding capacity
  - aeration
  - soil pH
  - soil management and testing
  - nutrients/nutrient balance
  - chemical fertilizers
  - fertilizer application
  - artificial soils
- d. Plant propagation
  - seeding
  - transplanting/potting
  - cuttings, rhizomes, and corms
  - budding and grafting
- e. Landscape design
  - basic principles of design
  - reading and interpreting plans and scales
- f. Plant materials (for plants listed in plant ID)
  - water and soil needs
  - light requirement
  - use in the landscape
  - pest problems
  - maintenance needs
- g. Nursery practices
  - harvest stock (bare root, B & B, tree spade)
  - store stock (cold storage, healing in)
  - prune stock
  - control pests
- h. Landscape practices
  - selection
  - planting
  - stake and wrap trees
  - install edging and mulches
  - water and fertilize new plantings
- i. Turf and grounds maintenance
  - seeding
  - sodding
  - renovation and aeration
  - mowing

3. Plant Identification- See Identification Sheet #1 (Page 4)

4. Equipment, Pests, Disorders, and Insects Identification- See Identification Sheet # 2 (Page 5)

### 5. References: Suggested Books and Publications

- o Landscaping Principles and Practices, Ingels- Delmar
  - o Introductory to Plant Science, Rick Parker- Delmar
  - o Manual of Woody Landscape Plants, Michael Dirr
  - o Trees of Minnesota- Field Guide, Tekiela
  - o Weeds of the Northern US and Canada, Royer and Dickinson
- Other references are listed in the National FFA Nursery/Landscape CDE Rules

# Nursery/Landscape Plant Identification

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## 1. Annuals

- \_\_\_\_\_ 101 Begonia (wax/fibrous) (*Begonia x semperflorens*)
- \_\_\_\_\_ 102 Coleus (*Coleus spp.*)
- \_\_\_\_\_ 103 Dusty Miller (*Senecio cineraria*)
- \_\_\_\_\_ 104 Garden Verbena (*Verbena x hybrida*)
- \_\_\_\_\_ 105 Gerbera Daisy (*Gerbera spp.*)
- \_\_\_\_\_ 106 Impatiens (*Impatiens wallerana*)
- \_\_\_\_\_ 107 Marigold (*Tagetes spp.*)
- \_\_\_\_\_ 108 Ornamental Kale (*Brassica oleracea*)
- \_\_\_\_\_ 109 Pansy (*Viola x wittrockiana*)
- \_\_\_\_\_ 110 Petunia (*Petunia x hybrida*)
- \_\_\_\_\_ 111 Snapdragon (*Antirrhinum majus*)
- \_\_\_\_\_ 112 Sweet Alyssum (*Lobularia maritima*)
- \_\_\_\_\_ 113 Zonal Geranium (*Pelargonium spp.*)

## 2. Deciduous Shrubs

- \_\_\_\_\_ 201 American Highbush Cranberry (*Viburnum triobum*)
- \_\_\_\_\_ 202 Amur Maple (*Acer ginnala*)
- \_\_\_\_\_ 203 Annabelle Hydrangea (*Hydrangea arborescens*)
- \_\_\_\_\_ 204 Azalea (*Rhododendron spp.*)
- \_\_\_\_\_ 205 Common Lilac (*Syringa vulgaris*)
- \_\_\_\_\_ 206 Common Ninebark (*Physocarpus opulifolius*)
- \_\_\_\_\_ 207 Dwarf Bush Honeysuckle (*Diervilla lonicera*)
- \_\_\_\_\_ 208 Dwarf Korean Lilac (*Syringa meyeri Palibin*)
- \_\_\_\_\_ 209 Forsythia (*Forsythia spp.*)
- \_\_\_\_\_ 210 Fragrant Sumac (*Rhus aromatica*)
- \_\_\_\_\_ 211 Honeysuckle (*Lonicera spp.*)
- \_\_\_\_\_ 212 Japanese Barberry (*Berberis thunbergii*)
- \_\_\_\_\_ 213 Nannyberry Viburnum (*Viburnum lentago*)
- \_\_\_\_\_ 214 PeeGee Hydrangea (*Hydrangea paniculata*)
- \_\_\_\_\_ 215 Peking Cotoneaster (*Cotoneaster acutifolius*)
- \_\_\_\_\_ 216 Red Twigg Dogwood (*Cornus sericea*)
- \_\_\_\_\_ 217 Rose (*Rosa spp.*)
- \_\_\_\_\_ 218 Spirea (*Spiraea spp.*)
- \_\_\_\_\_ 219 Weigela (*Weigela florida*)
- \_\_\_\_\_ 220 Winged Euonymus (*Euonymus alatus*)

## 3. Deciduous Trees

- \_\_\_\_\_ 301 American Basswood (*Tilia americana*)
- \_\_\_\_\_ 302 American Elm (*Ulmus americana*)
- \_\_\_\_\_ 303 Bur Oak (*Quercus macrocarpa*)
- \_\_\_\_\_ 304 European Mountain Ash (*Sorbus aucuparia*)
- \_\_\_\_\_ 305 Flowering Crabapple (*Malus species*)
- \_\_\_\_\_ 306 Ginkgo (*Ginkgo biloba*)
- \_\_\_\_\_ 307 Green Ash (*Fraxinus pennsylvanica*)
- \_\_\_\_\_ 308 Hackberry (*Celtis occidentalis*)
- \_\_\_\_\_ 309 Hawthorn (*Crataegus spp.*)
- \_\_\_\_\_ 310 Japanese Tree Lilac (*Syringa reticulata*)
- \_\_\_\_\_ 311 Kentucky Coffee Tree (*Gymnocladus dioica*)
- \_\_\_\_\_ 312 Little Leaf Linden (*Tilia cordata*)
- \_\_\_\_\_ 313 Northern Pin Oak (*Quercus ellipsoidalalis*)
- \_\_\_\_\_ 314 Norway Maple (*Acer platanoides*)
- \_\_\_\_\_ 315 Paper Birch (*Betula papyrifera*)
- \_\_\_\_\_ 316 Red Maple (*Acer rubrum*)
- \_\_\_\_\_ 317 Red Oak (*Quercus rubra*)
- \_\_\_\_\_ 318 River Birch (*Betula nigra*)

## 3. Deciduous Trees (continued)

- \_\_\_\_\_ 322 Serviceberry (*Amelanchier x grandiflora*)
- \_\_\_\_\_ 323 Silver Maple (*Acer saccharinum*)
- \_\_\_\_\_ 324 Sugar Maple (*Acer saccharum*)
- \_\_\_\_\_ 325 Swamp White Oak (*Quercus bicolor*)
- \_\_\_\_\_ 326 Thornless Honeylocust (*Gleditsia triacanthos*)
- \_\_\_\_\_ 327 Weeping Willow (*Salix alba*)
- \_\_\_\_\_ 328 White Ash (*Fraxinus americana*)
- \_\_\_\_\_ 329 White Oak (*Quercus alba*)

## 4. Evergreen shrubs

- \_\_\_\_\_ 401 Arborvitae (*Thuja occidentalis*)
- \_\_\_\_\_ 402 Juniper (*Juniperus spp.*)
- \_\_\_\_\_ 403 Mugo Pine (*Pinus mugo*)
- \_\_\_\_\_ 404 Rhododendron (*Rhododendron spp.*)
- \_\_\_\_\_ 405 Yew (*Taxus spp.*)

## 5. Evergreen trees

- \_\_\_\_\_ 421 Austrian Pine (*Pinus nigra*)
- \_\_\_\_\_ 422 Balsam Fir (*Abies balsamea*)
- \_\_\_\_\_ 423 Black Hills Spruce (*Picea glauca densata*)
- \_\_\_\_\_ 424 Colorado Spruce (*Picea pungens*)
- \_\_\_\_\_ 425 Eastern White Pine (*Pinus strobus*)
- \_\_\_\_\_ 426 Red Pine (*Pinus resinosa*)
- \_\_\_\_\_ 427 Scots Pine (*Pinus sylvestris*)
- \_\_\_\_\_ 428 White Fir (*Abies concolor*)

## 6. Other Plants- Bulbs, Grasses, & Vines

- \_\_\_\_\_ 441 Boston Ivy (*Parthenocissus tricuspidata*)
- \_\_\_\_\_ 442 Clematis (*Clematis spp.*)
- \_\_\_\_\_ 443 Crocuses (*Crocus spp.*)
- \_\_\_\_\_ 444 Daffodil (*Narcissus spp.*)
- \_\_\_\_\_ 445 Dropmore Honeysuckle (*Lonicera x brownii*)
- \_\_\_\_\_ 446 Feather Reed Grass (*Calamagrostis x acutiflora*)
- \_\_\_\_\_ 447 Fescue (*Festuca spp. and cv.*)
- \_\_\_\_\_ 448 Kentucky Bluegrass (*Poa pratensis cv.*)
- \_\_\_\_\_ 449 Prairie Dropseed (*Sporobolus heterolepis*)
- \_\_\_\_\_ 450 Switchgrass (*Panicum virginicum*)
- \_\_\_\_\_ 451 Tulip (*Tulipa spp.*)

## 7. Perennials

- \_\_\_\_\_ 501 Astilbe (*Astilbe spp.*)
- \_\_\_\_\_ 502 Iris (*Iris spp.*)
- \_\_\_\_\_ 503 Black Eyed Susan (*Rudbeckia fulgida*)
- \_\_\_\_\_ 504 Columbine (*Aquilegia spp.*)
- \_\_\_\_\_ 505 Coral Bells (*Heuchera spp.*)
- \_\_\_\_\_ 506 Daylily (*Hemerocallis spp.*)
- \_\_\_\_\_ 507 Gaillardia (*Gaillardia grandiflora*)
- \_\_\_\_\_ 508 Garden Mum (*Chrysanthemum spp.*)
- \_\_\_\_\_ 509 Hosta (*Hosta spp.*)
- \_\_\_\_\_ 510 Liatris (*Liatris spicata*)
- \_\_\_\_\_ 511 Pachysandra (*Pachysandra terminalis*)
- \_\_\_\_\_ 512 Peony (*Paeonia spp.*)
- \_\_\_\_\_ 513 Purple Coneflower (*Echinacea purpurea*)
- \_\_\_\_\_ 514 Sedum (*Sedum spurium*)
- \_\_\_\_\_ 515 Shasta Daisy (*Leucanthemum x superbum*)
- \_\_\_\_\_ 516 Wintercreeper Euonymus (*Euonymus fortunei*)

# Nursery/Landscape Equipment, Pests, Disorders, Insects & Weeds Identification

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## A. Equipment and Supplies

- \_\_\_\_\_ 701 Anvil and Blade Pruner
- \_\_\_\_\_ 702 Bow Saw
- \_\_\_\_\_ 703 Broadcast (cyclone spreader)
- \_\_\_\_\_ 704 Bulb Planter
- \_\_\_\_\_ 705 Bunker Rake
- \_\_\_\_\_ 706 Chain saw
- \_\_\_\_\_ 707 Core aerifier
- \_\_\_\_\_ 708 Drop Spreader
- \_\_\_\_\_ 709 Edger (power or hand)
- \_\_\_\_\_ 710 Edging
- \_\_\_\_\_ 711 Erosion Netting
- \_\_\_\_\_ 712 Fertilizer injector
- \_\_\_\_\_ 713 Fertilizer tablet
- \_\_\_\_\_ 714 Garden (bow) Rake
- \_\_\_\_\_ 715 Garden (spading) Fork
- \_\_\_\_\_ 716 Grafting Band
- \_\_\_\_\_ 717 Grafting Knife
- \_\_\_\_\_ 718 Hedge Shears
- \_\_\_\_\_ 719 Hoe
- \_\_\_\_\_ 720 Hook and Blade Pruner (Bypass)
- \_\_\_\_\_ 721 Hose-end Sprayer
- \_\_\_\_\_ 722 Impact Sprinkler
- \_\_\_\_\_ 723 Landscape fabric
- \_\_\_\_\_ 724 Leaf Rake
- \_\_\_\_\_ 725 Loppers
- \_\_\_\_\_ 726 Mattock
- \_\_\_\_\_ 727 Measuring Wheel
- \_\_\_\_\_ 728 Mist Nozzle (mist bed)
- \_\_\_\_\_ 729 Mower blade balancer
- \_\_\_\_\_ 730 Oscillating sprinkler
- \_\_\_\_\_ 731 Peat moss
- \_\_\_\_\_ 732 Pick axe
- \_\_\_\_\_ 733 Pole Pruner
- \_\_\_\_\_ 734 Pop-up irrigation head
- \_\_\_\_\_ 735 Post-hole digger
- \_\_\_\_\_ 736 Power auger
- \_\_\_\_\_ 737 Power Blower
- \_\_\_\_\_ 738 Power Hedge trimmer
- \_\_\_\_\_ 739 Pruning saw
- \_\_\_\_\_ 740 Pump Sprayer
- \_\_\_\_\_ 741 Quick Coupler
- \_\_\_\_\_ 742 Reel Mower
- \_\_\_\_\_ 743 Rotary Mower
- \_\_\_\_\_ 744 Rototiller
- \_\_\_\_\_ 745 Round Point Shovel
- \_\_\_\_\_ 746 Scoop Shovel
- \_\_\_\_\_ 747 Shade Fabric
- \_\_\_\_\_ 748 Siphon Proportioner
- \_\_\_\_\_ 749 Soil Sampling Probe
- \_\_\_\_\_ 750 Spade
- \_\_\_\_\_ 751 Sphagnum moss
- \_\_\_\_\_ 752 Square point (flat shovel)
- \_\_\_\_\_ 753 String trimmer
- \_\_\_\_\_ 754 Thatch Rake
- \_\_\_\_\_ 755 Tree Wrap
- \_\_\_\_\_ 756 Vertical Mower

## B. Beneficial Insects & Pests

- \_\_\_\_\_ 801 Lacewing
- \_\_\_\_\_ 802 Lady Beetle
- \_\_\_\_\_ 803 Paper Wasp
- \_\_\_\_\_ 804 Praying Mantis
- \_\_\_\_\_ 805 Spider
- \_\_\_\_\_ 806 Aphid
- \_\_\_\_\_ 807 Birch borer
- \_\_\_\_\_ 808 Cankerworm
- \_\_\_\_\_ 809 Emerald ash borer
- \_\_\_\_\_ 810 Leafhopper
- \_\_\_\_\_ 811 Leaf Miner
- \_\_\_\_\_ 812 Scale
- \_\_\_\_\_ 813 Spider Mites
- \_\_\_\_\_ 814 Snail/Slug
- \_\_\_\_\_ 815 Tent caterpillar
- \_\_\_\_\_ 816 Whitefly
- \_\_\_\_\_ 817 White Grub

## D. Plant diseases

- \_\_\_\_\_ 821 Anthracnose
- \_\_\_\_\_ 822 Apple scab
- \_\_\_\_\_ 823 Black knot disease
- \_\_\_\_\_ 824 Black spot
- \_\_\_\_\_ 835 Botrytis
- \_\_\_\_\_ 826 Canker
- \_\_\_\_\_ 827 Cedar-Apple Rust
- \_\_\_\_\_ 828 Crown Gall
- \_\_\_\_\_ 829 Dollar spot
- \_\_\_\_\_ 830 Dutch elm disease
- \_\_\_\_\_ 831 Fireblight
- \_\_\_\_\_ 832 Leaf galls
- \_\_\_\_\_ 833 Powdery Mildew
- \_\_\_\_\_ 834 Root Rot
- \_\_\_\_\_ 835 Rust
- \_\_\_\_\_ 836 Snow Mold
- \_\_\_\_\_ 837 White pine blister rust

## E. Physiological Problems

- \_\_\_\_\_ 851 2,4-D Injury
- \_\_\_\_\_ 852 Frost/Freeze Injury
- \_\_\_\_\_ 853 Iron Deficiency
- \_\_\_\_\_ 854 Leaf Scorch (drought/winter burn)
- \_\_\_\_\_ 855 Nitrogen Deficiency
- \_\_\_\_\_ 856 Planting Depth Problem
- \_\_\_\_\_ 857 Pot-Bound Roots
- \_\_\_\_\_ 858 Stem Girdling Roots
- \_\_\_\_\_ 859 String Trimmer Injury

## F. Weeds

- \_\_\_\_\_ 901 Chickweed
- \_\_\_\_\_ 902 Crabgrass
- \_\_\_\_\_ 903 Creeping Charlie
- \_\_\_\_\_ 904 Dandelion
- \_\_\_\_\_ 905 Foxtail
- \_\_\_\_\_ 906 Knotweed
- \_\_\_\_\_ 907 Nutsedge
- \_\_\_\_\_ 908 Oxalis
- \_\_\_\_\_ 909 Plantain
- \_\_\_\_\_ 910 Purslane
- \_\_\_\_\_ 911 Quackgrass
- \_\_\_\_\_ 912 Clover