Nursery/ Landscape

Nebraska Career Development Event
Handbook and Rules for 2023-2027

1. EVENT PURPOSE

Nursery & Landscape is a discipline of horticulture focused on landscape design concepts; identifying, growing and managing landscape plants; and understanding and using hardscape materials and related products.
The Nursery & Landscape Industry encompasses the following career opportunities:

- Production and management of nursery crops, including woody and herbaceous plants and turf grass
- Landscape design, from client contact through site assessment to installation for private, commercial, and public sites
- Landscape management, encompassing all aspects of landscape plants, beneficial insects and insect pests and diseases, and equipment use

Education, research and technology fields used in plant and landscape systems The Nebraska Nursery & Landscape Career Development Event is designed to create an interest in careers in the Nursery and Landscape Industries through education and hands on technical skills development. Areas of study and education that may align with the Nursery & Landscape CDE include Horticulture; Landscape Design and Management; Landscape, Greenhouse and Nursery Management; Turfgrass Management; Plant Science; Plant Biology and others.

2. OBJECTIVES

a. Demonstrate an understanding of the science and art associated with landscape design systems, principles, and processes
   i. Interpret client questions and answers to determine whether communication is effective
   ii. Identify different types of landscape drawings and demonstrate your knowledge about how they are used to communicate to clients, contractors and managers
   iii. Analyze and assess site conditions (environmental, constructed, social/political) that will influence the success of a landscape plan
   iv. Examine and interpret a landscape plan that includes plants, hardscape materials, and all aspects of a landscape system: Identify and describe how various elements and materials demonstrate order, unity, rhythm, scale and proportion, balance and focal points in a landscape plan
   v. Demonstrate how various plant types (evergreens, deciduous shrubs, etc.) are combined as part of the landscape system for function, management capabilities and aesthetics
   vi. Correctly use drawings and drawing tools to calculate areas, volumes and quantities, and make necessary conversions to produce correct numbers for materials needed
   vii. Solve common calculations required to compare sizes, estimate prices, and determine correct application rates for landscape plants, hardscape materials, and chemicals
   viii. Compare estimates of time and materials needed to complete a task to recommend the most cost-effective solution
   ix. Evaluate and demonstrate logical processes used from site analysis through installation and management
   x. Identify plant materials, supplies and equipment utilized in the Nursery/Landscape Industry
   xi. Identify woody and herbaceous plants commonly used in Nebraska landscapes.
   xii. Define general and specialized terms related to root, stem, leaf, flower, fruits and seeds morphology, type, venation, arrangement, and persistence
   xiii. Differentiate between different kingdoms, vascular plants and non- vascular plants, angiosperms and gymnosperms, monocotyledons and dicotyledons
   xiv. Differentiate between various types of flowers and fruits
   xv. Demonstrate knowledge about correct scientific nomenclature, including identifying and describing the differences between genus, specific epithet, varieties, cultivars, hybrids and authorities
   xvi. Apply knowledge about plant identification to understanding how to assess a site environment for suitability to a plant's needs, and what management issues may arise if conditions are not ideal
   xvii. Identify insects (including beneficials), diseases, and weeds commonly found in Nebraska landscapes
   xviii. Apply knowledge about correct identification and use of tools and equipment needed to install and manage landscapes
   xix. Identify tools used in developing landscape plans

b. Demonstrate an understanding of life sciences through application of general knowledge required to successfully produce and handle nursery materials and use best practices to sustainably manage them in landscapes. (See Resource Materials List)
   i. Recognize and describe factors influencing soil formation, major soil components and soil horizons

ii. Determine how landscape soils differ from other soils, and what steps should be taken to promote soil and plant health, including soil sampling and testing
iii. Apply knowledge about essential elements for plant growth and how these elements are absorbed and used to provide plant nutrition
iv. Demonstrate the ability to read and interpret labels for fertilizers and chemical insect and pest control, perform area takeoffs and other calculations to determine correct amounts and rates, and answer questions necessary to use products safely and legally

c. Demonstrate an understanding of Integrated Pest Management (IPM) and Best Management Practices (BMPs). (See Resource Materials List)
   i. Using live and/or digital images, Identify atypical abiotic and biotic landscape symptoms, most probable cause, and recommended management procedures and materials
   ii. Demonstrate knowledge about pesticide signal words, Lethal Dose (LD) and management of pesticide exposure risk and symptoms
   iii. Recommend in order the steps used to develop an IPM or BMP program
   iv. Describe different cultural, mechanical, and biological controls used in an Integrated Pest Management program
   v. Evaluate various stages of metamorphosis and how threshold levels and effectiveness of control methods are related
   vi. Compare situations where different fertilizers, soil amendments or pesticides are used to determine best practices for environmental management.

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3. ELIGIBILITY

This event is open to students in grades 9-12. The top four schools in a district may qualify as a team to the state CDE. Teams shall consist of four students. Schools must register a full team; however, teams with fewer than four students may participate but will not be eligible to earn all points.

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4. RECOMMENDED ATTIRE

FFA members participating in this event are advised to wear Official FFA Dress. Jackets may be removed during hands-on activities. Non-FFA members should wear professional dress.

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5. REQUIRED SUPPLIES AND EQUIPMENT

Each student (or team) is required to bring the following short list of items. A limited number may be available for use at the competition; however, these will be first-come first-serve. Scoring adjustments will not be made for students lacking the required supplies. Instructors will be notified of additional supplies and equipment needed at least two weeks prior to the state CDE.

1. #2 Pencils
2. Calculator--cellphones may not be used as calculators and are not allowed in this CDE
3. Engineering scale - minimum of 2 per team

4. Architects' scale - minimum of 2 per team

6. EVENT SCHEDULE

See the CDE schedule on the website for the specific dates, places, and start times. Students shall check in 20 minutes prior to the scheduled event start time. Students will rotate between three stations, with 30 minutes per event at each station and five minutes between stations. The specific schedule for each team's rotation will be provided at the beginning of the competition.

- Orientation and Event Instructions
- Team Activity
- General Knowledge and Problem Solving
- Plant, Pest, and Equipment Identification

7. ANNUAL THEME

The Nursery/Landscape CDE is based on a broad landscape type that would be found in most communities and would be common for nursery and landscape businesses. Each year, the broad landscape type will change. Basic questions will remain constant from year to year (equipment and plant ID, for example), with the application and problem-solving activities and questions varying based on the landscape type. If changes are to be made, they will be communicated prior to the start of the fall semester.

Each year, questions and activities will include the following important steps in the process used to design, build, and manage landscapes:

- Client questions and communication
- Site inventory and assessment
- Management
- Design

The emphasis on a specific step in the process will change each year, as shown in the theme schedule. However, the competition will always include questions pertaining to each of the other aspects of the process, with design emphasis remaining constant.
Theme Schedule

- 2023 --Commercial site (business landscape, management)
- 2024 --Public site (school or park landscape, site inventory and assessment)
- 2025 --Residential site (home landscape, client questions and communication)
- 2026 --Commercial site (business landscape, management)

8. EVENT FORMAT

The Nursery and Landscape CDE consists of both team and individual activities.

Team Activity--30 minutes

Design Principles and Application

a. Students will be given a landscape plan and other drawings and images and work together to 1) analyze and assess the environmental site conditions, and 2) interpret design intent and choose the plants and hardscape elements that contribute to the design. A narrative or short case study statement will introduce the plan and set the stage for completing this part of the competition. Specific parts of the plan will be identified by a letter or number and students will answer questions that correctly describe the situation. Contestants will have a 'choose from' list of possibilities.

b. Students may complete landscape calculations as a part of this activity, and in the General Knowledge and Problem-Solving activity.

Individual Activities

Activity 1: Plant, Pest, and Equipment Identification--30 minutes

a. Students will use live, and pressed and/or preserved specimens supplemented with digital images to identify plants, insects, diseases, and equipment. Contestants will be provided with the identification lists (**Appendix 1**) and will enter the corresponding number from the lists for the correct choice. This activity will consist of a total of 50 specimens and/or images.

Activity 2: General Knowledge and Problem Solving--30 minutes

a. Students will be given an introductory narrative or a short case study statement based on the year's landscape theme. The narrative and plan will be the basis for all answers for this written exam. The exam will include 50 questions and problems, which may take the form of multiple-choice, matching, or fill-in-the-blank. The majority of the questions will be story problems. Calculations and problem-solving questions will thread together client communication, site inventory and assessment, management, and design. For example, students may be given a product label and expected to accurately identify its legal uses and the required amount for a given area on the plan.

Contestants may be given questions about nursery propagation methods; landscape materials suitability, quantities, and area takeoffs; plant growth processes and how they are impacted by environmental conditions and management.

9. SCORING

The following represents how team and individual scores are calculated:

Team Score Calculation		Score
Team Design Principles & Application Activity		100
• Individual Scores	4 individuals x 220 points	880
• Total Points Possible		980

Individual Score Calculation		Score
• Plant, Pest, and Equipment Identification	60 questions x 2 points	120
• General Knowledge & Problem Solving	50 questions x 2 points	100
• Total Points Possible		220

10. TIEBREAKER

To determine the award order for individuals involved in a tie, the following will be utilized in rank order:

1. General Knowledge and Problem-Solving Score
2. Plant, Pest, and Equipment Identification Score

To determine the award order for teams involved in a tie, the following will be utilized in rank order:

1. Team Activity Score (Design Principles and Application)
2. General Knowledge and Problem-Solving Score
3. Plant, Pest, and Equipment Identification Score

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11. RESOURCE MATERIALS

It is recommended that students study from the following materials in preparation for the event:

a. Introductory Horticulture, 9th Ed. (or previous). Carroll Shry and Edward Reiley. Delmar Cengage Learning. ISBN# 978-1285424729
b. Classification and Naming of Plants (NU Extension Publication EC1272)
c. Identifying Landscape Plants (NU Extension Publication EC1265)
d. Grow a Beautiful Space (NU Extension Curriculum)
e. Properties of Landscape Soils (NU Extension Publication EC1267)
f. Plant Nutrients and Soil Fertility (NU Extension Publication EC1275)
g. Pesticide Safety in Landscapes (NU Extension Publication EC 1271)
h. Integrated Pest Management for Landscapes (NU Extension Publication EC1266)
i. Common Signs and Symptoms of Unhealthy Plants (NU Extension Publication EC 1270)

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12. PAST EXAMS

See the CDE Study Materials for past exams and scantrons.

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13. POST-CDE DEBRIEFING OPPORTUNITY

A post-CDE briefing will be available immediately following the competition. In addition, a summary of comments will be provided digitally to instructors prior to the end of the school year.

Appendix

Appendix 1: Plant Identification List

KEY	#	SCIENTIFIC NAME	COMMON NAME	NE
DS	101	Abelia x grandiflora	Glossy Abelia	
ET	102	Abies concolor	White Fir	X
DT	103	Acer palmatum cv.	Japanese Maple	X
DT	104	Acer platanoides cv.	Norway Maple	
DT	105	Acer rubrum cv.	Red Maple	X
DT	106	Acer saccharum cv.	Sugar Maple	X
HP	107	Ajuga reptans cv.	Carpet Bugle	X
HA	108	Antirrhinum majus cv.	Snapdragon	X
HP	109	Aquilegia x hybrida cv.	Columbine	X
DT	110	Amelanchier arborea	Downy Serviceberry	X
HP	111	Astilbe hybrid cv.	Astilbe	
HA	112	Begonia semperflorenscultorum	Wax Begonia	X
BES	113	Berberis x mentorensis	Mentor Barberry	
DT	114	Betula nigra	River Birch	X
HA	115	Brassaia actinophylla	Schefflera, Octopus Tree	
BES	116	Buxus microphylla cv.	Littleleaf Boxwood	X
DS	117	Camellia japonica cv.	Common Camellia	
ET	118	Cedrus atlantica ‘Glauca’	Blue Atlas Cedar	
DT	119	Cercis canadensis	Redbud	X
DS	120	Chaenomeles speciosa cv.	Japanese (Flowering) Quince	X
DV	121	Clematis hybrid	Clematis	X
DT	122	Cornus florida cv.	Flowering Dogwood	
BES	123	Cotoneaster dammeri	Bearberry Cotoneaster	
DS	124	Cotoneaster divaricatus	Spreading Cotoneaster	X
DT	125	Crataegus phaenopyrum	Washington Hawthorn	X
GC	126	Cynodon dactylon cv	Bermudagrass	
HA	127	Dieffenbachia maculata cv.	Spotted Dumb Cane	
HA	128	Dracaena deremensis ‘Warneckii’	Striped Dracaena	
HA	129	Dracaena fragens ‘Massangeana’	Corn Plant	X
HP	130	Echinaceae purpurea	Purple Coneflower	X
HA	131	Epipremnum spp.	Pothos	X
DS	132	Euonymus alatus	Winged Euonymus	X
BEV	133	Euonymus fortunei cv.	Wintercreeper	X
DT	134	Fagus sylvatica cv.	European Beech	X
GC	135	Festuca spp. and cv.	Fescue	X
HA	136	Ficus benjamina	Benjamin Fig	X
HA	137	Ficus elastica ‘Decora’	Decora Rubber Plant	
DS	138	Forsythia x intermedia cv.	Border Forsythia	X
DT	139	Fraxinus americana cv.	White Ash	
HP	140	Gaillardia aristata cv.	Common Blanketflower	
DS	141	Gardenia jasminoides ‘Fortuniana’	Common Gardenia	
DT	142	Ginkgo biloba	Ginkgo, Maidenhair Tree	X
DT	143	Gleditsia triacanthos inermis cv.	Thornless Honeylocust	X
BEV	144	Hedera helix cv.	English Ivy	
HP	145	Hemerocallis spp. and cv.	Day lily	X

KEY	#	SCIENTIFIC NAME	COMMON NAME	NE
HP	146	Hosta x hybrida cv.	Plaintain Lily	X
DS	147	Hydrangea quercifolia	Oakleaf Hydrangea	X
DS	148	Hydrangea macrophylla	Bigleaf Hydrangea	
BET	149	Ilex cornuta cv.	Chinese Holly	
BES	150	Ilex crenata cv.	Japanese Holly	
BES	151	Ilex x meserveae cv.	Meserve Holly	X
HA	152	Impatiens hybrid cv.	Impatiens	X
HP	153	Iris x germanica florentina cv.	Bearded Iris	X
ES	154	Juniperus chinensis cv.	Chinese Juniper	X
ES	155	Juniperus horizontalis cv.	Creeping Juniper	X
DT	156	Lagerstroemia indica cv.	Crape Myrtle	
HP	157	Leucanthemum x superbum	Shasta Daisy	
DT	158	Liquidambar styraciflua	Sweet Gum	X
DT	159	Liriodendron tulipifera	Tuliptree	X
GC	160	Liriope spp. cv.	Lilyturf	X
DV	161	Lonicera japonica ‘Halliana’	Hall’s Japanese Honeysuckle	
BET	162	Magnolia grandiflora cv.	Southern Magnolia	
DT	163	Magnolia x soulangiana cv.	Chinese (Saucer) Magnolia	X
BES	164	Mahonia aquifolia cv.	Oregon Grape	
DT	165	Malus spp. and cv.	Flowering Crabapple	X
BES	166	Myrica pensylvanica	Bayberry	
BES	167	Nandina domestica	Heavenly Bamboo	
HP	168	Narcissus pseudonarcissus cv.	Daffodil	X
DT	169	Nyssa sylvatica	Sour (Black) Gum	
GC	170	Pachysandra terminalis	Japanese Spurge	
HP	171	Paeonia hybrid cv.	Peony	X
V	172	Parthenocissus tricuspidata	Boston Ivy	X
HA	173	Pelargonium x hortorum cv.	Zonal Geranium	X
HA	174	Pennisetum ruppelia	Fountain Grass	X
HA	175	Petunia x hybrida cv.	Petunia	X
HA	176	Philodendron scandens oxycardium	Heartleaf Philodendron	
ET	177	Picea abies	Norway Spruce	X
ET	178	Picea pungens cv.	Colorado (Blue) Spruce	X
BES	179	Pieris japonica	Lily-of-the-Valley Bush	
ES	180	Pinus mugo	Mugo Pine	X
ET	181	Pinus strobus	Eastern White Pine	X
ET	182	Pinus sylvestris	Scotch Pine	
ET	183	Pinus thunbergiana	Japanese Black Pine	
DT	184	Platanus x acerifolia	London Planetree	X
GC	185	Poa pratensis cv .	Kentucky Bluegrass	X
BES	186	Podocarpus macrophyllus	Southern Yew	
DS	187	Potentilla fruticosa cv.	Shrubby Cinquefoil	
BES	188	Prunus laurocerasus cv.	Cherry Laurel	
DT	189	Prunus serrulata ‘Kwanzan’	Kwanzan Japanese Flowering Cherry	
BES	190	Pyracantha coccinea cv.	Firethorn	
DT	191	Quercus alba	White Oak	
DT	192	Quercus palustris	Pin Oak	

KEY	#	SCIENTIFIC NAME	COMMON NAME	NE
DT	193	Quercus rubra	Red Oak	X
BES	194	Rhododendron x catawbiense	Catawba Hybrid Rhododendron	X
BES	195	Rhododendron Hybrid	Exbury Hybrid Azalea	X
DS	196	Rosa spp.	Landscape/Shrub Rose cv.	X
HP	197	Salvia nemorosa cv.	Meadow Sage	X
HP	198	Sedum spp.	Sedum	X
HA	199	Solenostemon scutellarioides	Coleus	X
DT	200	Sorbus aucuparia	European Mountain Ash	
DS	201	Spiraea x bumalda	Bumalda Spirea	X
DS	202	Syringa vulgaris cv.	Common Lilac	X
HA	203	Tagetes spp. cv.	Marigold	X
DT	204	Taxodium distichum	Bald Cypress	X
ES	205	Taxus spp. and cv.	Yew	X
ES	206	Thuja occidentalis cv.	American Arborvitae	
DT	207	Tilia cordata	Littleleaf Linden	X
ET	208	Tsuga canadensis	Canadian Hemlock	
HP	209	Tulipa spp. cv.	Tulip	X
HA	210	Verbena x hybrida cv.	Garden Verbena	
BES	211	Viburnum x burkwoodii	Burkwood Viburnum	
DS	212	Viburnum trilobum	American Cranberrybush Viburnum	X
BEV	213	Vinca minor cv.	Periwinkle	X
HA	214	Viola x wittrockiana cv.	Pansy	X
DV	215	Wisteria sinensis cv.	Chinese Wisteria	X
HP	216	Yucca filamentosa	Adam's Needle	X

Table Key:

BES – Broadleaf Evergreen Shrub
BES – Broadleaf Evergreen Shrub
BET – Broadleaf Evergreen Tree
BEV – Broadleaf Evergreen Vine
BI – Beneficial Insect
D – Disease
DS - Deciduous Shrub
DT – Deciduous Tree
DV – Deciduous Vine
E – Equipment
ES – Evergreen Shrub
ET – Evergreen Tree
GC – Ground Cover
HA – Herbaceous Annual
HP – Herbaceous Perennial
I – Insect
PP – Physiological Problems
W – Weed

Appendix 2: Pest Identification List

KEY	#	COMMON NAME	NE
I	217	Aphid	X
I	218	Bagworm	X
I	219	Borer	X
I	220	Leafhopper	X
I	221	Leaf Miner	X
I	222	Scale	X
I	223	Spider Mite	X
I	224	Snail/Slug	X
I	225	Whitefly	X
I	226	White Grub	X
D	227	Anthracnose	X
D	228	Apple Scab	X
D	229	Black Spot	X
D	230	Botrytis	X
D	231	Canker	X
D	232	Cedar-Apple Rust	X
D	233	Crown Gall	X
D	234	Fireblight	X
D	235	Powdery Mildew	X
D	236	Root Rot	X
W	237	Annual Bluegrass	X
W	238	Broadleaf Plantain	X
W	239	Buckhorn Plantain	X
W	240	Chickweed	X
W	241	Crabgrass	X
W	242	Dandelion	X
W	243	Henbit	X
W	244	Nutsedge	X
W	245	Oxalis	X
W	246	Purslane	X
W	247	Clovers	X
PP	248	Frost/Freeze Injury	X
PP	249	Iron Deficiency	
PP	250	Leaf Scorch (drought/winter burn)	X
PP	251	Nitrogen Deficiency	X
PP	252	Pot-Bound roots	
PP	253	String Trimmer Injury	X
PP	254	2,4-D Injury	X
BI	255	Praying Mantis	X
BI	256	Lady Beetle	
BI	257	Paper Wasp	X
BI	258	Lacewing	
BI	259	Spider	X

Appendix 3: Equipment Identification List

KEY	#	NAME	NE
E	260	anvil-and-blade pruner	X
E	261	ball cart (B&B truck)	
E	262	bark mulch	
E	263	bow saw	
E	264	broadcast (cyclone) spreader	
E	265	bubbler head, irrigation	X
E	266	bulb planter	
E	267	bunker rake	
E	268	burlap	
E	269	compressed air sprayer	
E	270	core aerifier	
E	271	chain saw	
E	272	cut-off machine	X
E	273	drip emitter, irrigation	X
E	274	dry-lock wall block	
E	275	edger (power or hand)	
E	276	edging	
E	277	erosion netting	
E	278	fertilizer injector	
E	279	fertilizer tablet	
E	280	garden (spading) fork	
E	281	garden (bow) rake	
E	282	grafting band	
E	283	grafting knife	X
E	284	granular fertilizer	
E	285	gravity (drop) spreader	
E	286	ground/pelleted limestone	
E	287	hedge shears	
E	288	hoe	
E	289	hook-and-blade pruners	X
E	290	hose-end repair fitting	
E	291	hose-end sprayer	
E	292	hose-end washer	
E	293	hose repair coupling	
E	294	impact sprinkler	X
E	295	irrigation ring tool	
E	296	landscape fabric	
E	297	leaf rake	
E	298	loppers	
E	299	mattock	
E	300	measuring wheel	X
E	301	mist nozzle (mist bed)	X
E	302	mower blade balancer	
E	303	nursery container	
E	304	oscillating sprinkler	
E	305	peat moss	