

Identification of Plants and Tools (300 points): Composed of 50 specimens and/or samples. Plant samples selected for the CDE shall be fresh and observable. Samples will be selected from the Plant Identification List and the Tool Identification List. No more than 12 identification samples may come from the Tool List. (each specimen valued at 6 points)

Problem Solving (100 points) Problem Solving- 10 multiple-choice questions dealing with a given scenario at 10 points per problem. An example of each type is provided. 3 questions will be on disorders and treatments, 2 will be on flower design or plant selection, and 1 question will be from each of these areas:

- a. Retail Pricing given wholesale information
- b. Calculating the amount of media needed in a scenario including price
- c. Production schedule.
- d. Safety/ Reading label questions
- e. Fertilizer calculation questions.

Disorders that may be part of problem solving:

- | | | | | |
|-------------|-------------------|---------------|----------------------|------------------------|
| -Aphids | - Botrytis blight | -Damping off | -Fungus gnats | -Iron deficiency |
| -Leaf miner | -Mealybug | -Mildew | -Nitrogen deficiency | -Phosphorus deficiency |
| -Scale | -Slugs | -Spider mites | -Whitefly | |

2. Four members shall constitute a team for this CDE at the State FFA Convention. The top three scores will 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. Computer scan sheets will be used for this CDE. Form number 105482 will be used. Refer to the appendix for a sample.

6. 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.

7. References:

Floriculture Designing & Merchandising, Charles Griner- Delmar

Introductory Horticulture, Reiley & Shry- Delmar

Ball RedBook, Vic Ball

Fresh Flowers, Volume 3,- The John Henry Company

Flowering & Foliage Plants, Volume 3- The John Henry Company

7. The next page contains the complete list of plant

Floriculture Plant Identification			Use the top portion of the back side of scantron		
101	African Violet	<i>Saintpaulia ionantha cv.</i>	148	Larkspur	<i>Delphinium consolida cv.</i>
102	Ageratum	<i>Ageratum houstonianum</i>	149	Leatherleaf Fern	<i>Rumohra adiantiformis</i>
103	Aluminum Plant	<i>Pilea cadierei</i>	150	Liatris	<i>Liatris spicata</i>
104	Alyssum	<i>Lobularia maritima</i>	151	Marigold	<i>Tagetes species cv.</i>
105	Amaryllis	<i>Hippeastrum hybrid cv.</i>	152	Million Bells	<i>Calibrachoa hybrid cv.</i>
106	Angelonia	<i>Angelonia hybrid cv.</i>	153	Monte Cassino Aster	<i>Aster pringlei</i>
107	Asiatic or Oriental Lily	<i>Lilium hybrid cv.</i>	154	Moth Orchid	<i>Phalaenopsis cv.</i>
108	Florist Azalea	<i>Rhododendron simsii cv.</i>	155	Nephtytis	<i>Syngonium podophyllum</i>
109	Baby's Breath	<i>Gypsophila elegans cv.</i>	156	New Guinea Impatiens	<i>Impatiens sp.</i>
110	Basil	<i>Ocimum basilicum cv.</i>	157	Norfolk Island Pine	<i>Araucaria heterophylla</i>
111	Benjamin Fig	<i>Ficus benjamina cv.</i>	158	Ornamental Sweet Potato	<i>Impomoea batatas cv.</i>
112	Bird of Paradise	<i>Strelitzia reginae</i>	159	Pansy	<i>Viola x wittrockiana cv.</i>
113	Boston Fern	<i>Nephrolepis exaltata cv.</i>	160	Parlor Palm	<i>Chamaedorea elegans</i>
114	Caladium	<i>Caladium x hortulanum cv.</i>	161	Parsley	<i>Petroselinum crispum cv.</i>
115	Calla Lily	<i>Zantedeschia hybrid cv.</i>	162	Peace Lily	<i>Spathiphyllum</i>
116	Garden Canna	<i>Canna x generalis cv.</i>	163	Periwinkle	<i>Catharanthus roseus</i>
117	Carnation	<i>Dianthus caryophyllus cv.</i>	164	Peruvian Lily	<i>Alstroemeria hybrid cv.</i>
118	China Aster	<i>Callistephus chinensis cv.</i>	165	Petunia	<i>Petunia x hybrida cv.</i>
119	Christmas Cactus	<i>Schlumbergera bridgesii</i>	166	Pin Cushion Protea	<i>Leucospermum hybrid cv.</i>
120	Chrysanthemum	<i>Chrysanthemum x morifolium</i>	167	Poinsettia	<i>Euphorbia pulcherrima cv.</i>
121	Cockscomb	<i>Celosia argentea cv.</i>	168	Portulaca	<i>Portulaca oleracea cv.</i>
122	Coleus	<i>Solenostemon scutellariodes</i>	169	Prayer Plant	<i>Maranta leuconeura</i>
123	Croton	<i>Codiaeum variegatum pictum</i>	170	Red Edge Dracaena	<i>Dracaena cincta</i>
124	Cyclamen	<i>Cyclamen x persicum cv.</i>	171	Salvia	<i>Salvia splendens cv.</i>
125	Cymbidium Orchid	<i>Cymbidium cv.</i>	172	Silver Dollar Eucalyptus	<i>Eucalyptus polyanthemos</i>
126	Daffodil/ Narcissus	<i>Narcissus hybrid cv.</i>	173	Silver Vase Bromeliad	<i>Aechmea fasciata cv.</i>
127	Dahlia	<i>Dahlia hybrid cv.</i>	174	Snake Plant	<i>Sansevieria trifasciata cv.</i>
128	Dendrobium Orchid	<i>Dendrobium cv.</i>	175	Snapdragon	<i>Antirrhinum majus cv.</i>
129	Dusty Miller	<i>Senecio cineraria</i>	176	Solidago	<i>Solidago hybrid cv.</i>
130	Dutch Iris	<i>Iris x xiphium cv.</i>	177	Spider Plant	<i>Cholorophytum comosum cv.</i>
131	Dwarf Schefflera	<i>Schefflera arboricola</i>	178	Split Leaf Philodendron	<i>Monstera deliciosa</i>
132	English Ivy	<i>Hedera helix cv.</i>	179	Sprenger Fern	<i>Asparagus densiflorus</i>
133	Flamingo Plant	<i>Anthurium x andraeanum cv.</i>	180	Spring Heather	<i>Erica carnea cv.</i>
134	Freesia	<i>Freesia x hybrid cv.</i>	181	Statice	<i>Limonium sinuatum</i>
135	Fuchsia	<i>Fuchsia hybrid cv.</i>	182	Stephanotis	<i>Stephanotis floribunda</i>
136	Gerbera Daisy	<i>Gerbera jamesonii</i>	183	Sunflower	<i>Helianthus annuus</i>
137	Gladiolus	<i>Gladiolus x hortulanus cv.</i>	184	Tuberous Begonia	<i>Begonia x tuberhybrida cv.</i>
138	Golden Pothos	<i>Epipremnum aureum cv.</i>	185	Tulip	<i>Tulipa cv.</i>
139	Heartleaf Philodendron	<i>Philodendron scandens</i>	186	Verbena	<i>Verbena hybrida cv.</i>
140	Hens and Chicks	<i>Sempervivum hybrid cv.</i>	187	Vinca Vine	<i>Vinca Vine hybrid cv.</i>
141	Hyacinth	<i>Hyacinthus orientalis cv.</i>	188	Wandering Jew	<i>Tradescatia zebrine</i>
142	Hybrid Tea Rose	<i>Rosa hybrid cv.</i>	189	Wax Begonia	<i>Begonia x semperflorens-cultorum</i>
143	Hydrangea, Big Leaf	<i>Hydrangea macrophylla</i>	190	Wax Plant	<i>Hoya carnosa</i>
144	Impatiens	<i>Impatiens hybrid cv.</i>	191	Waxflower	<i>Chamelaucium uncinatum</i>
145	Ivy Geranium	<i>Pelargonium peltatum cv.</i>	192	Zebra Plant	<i>Aphelandra squarrosa cv.</i>
146	Jade Plant	<i>Crassula argentea</i>	193	Zinnia	<i>Zinnia cv.</i>
147	Kalanchoe	<i>Kalanchoe x blossfeldiana cv.</i>	194	Zonal Geranium	<i>Pelargonium x hortorum cv.</i>

Floriculture Tool & Equipment Identification

Use the back bottom portion side of scantron

301	#3 Ribbon (satin, sheer, wired)	326	Irrigation tape
302	#40 Ribbon (satin, sheer, wired)	327	Mist nozzle (mist bed)
303	#9 Ribbon (satin, sheer, wired)	328	Nosegay holder
304	18 gauge floral wire	329	Nursery container
305	28 gauge floral wire	330	Oscillating sprinkler
306	Anvil and blade pruner	331	Peat moss
307	Bouquet sleeve	332	Peat pots
308	Cardette	333	Pest strips
309	Cell pack container	334	pH testing meter
310	Coconut coir	335	Resin-coated fertilizer
311	Corsage box	336	Ribbon shears
312	Corsage pin	337	Rose and stem flower stripper
313	Dry foam	338	Shade fabric
314	Enclosure card	339	Sheet moss
315	Fern greening pins	340	Soil moisture meter
316	Floral Adhesive	341	Spanish moss
317	Floral foam	342	Spaghetti tubing (1/4" diameter or less)
318	Floral knife	343	Tulle
319	Floral preservative	344	Vermiculite
320	Floral stem tape	345	Water picks
321	Glue gun	346	Waterproof container tape
322	Glue pan	347	Wire cutter
323	Granular fertilizer	348	Wooden pick
324	Hanging basket	349	Wrist corsage holder
325	Hook and blade pruner (bypass)	350	Water soluble fertilizer

Problem Solving – Disorder example

Situation:

You are the production supervisor of the Mountain High Greenhouses and are currently growing potted chrysanthemums. Your assistant brings you a mature leaf which shows very light chlorotic stippling, as if very fine sand had been sprinkled on it. Upon close examination under magnification, yellowish oval bodied organisms with 6 to 8 legs and 2 dark spots were revealed. What appeared to be eggs were also present.

The temperature of your greenhouses was maintained at 70 degrees F, and a systemic organophosphate insecticide was applied at the beginning of the growing cycle.

What control measure might you implement to alleviate the present problem?

- A. **Introduce several predatory mite species simultaneously, monitor, reintroduce every 2 weeks.**
- B. Dust all plants thoroughly with Sevin (carbaryl) every 2 weeks.
- C. Thoroughly cover all plants with *Bacillus thuringiensis* (BT) at 2.5 tsp. per gallon of spray.
- D. Apply 4 tsp. malathion EC per gallon of spray every 10 days.

Calculating Media Example

Situation:

Mrs. Bell is the operations manager of Kelly Farms, She is planning to grow 2000 "Rose Supreme" hydrangeas in 8-inch standard type pots and 500 "Bougainvillea" in standard 12-inch standard type pots.

For her "Rose Supreme" hydrangeas she decided to purchase commercial growing media in 4 cubic foot bales at \$16.32 per bale. Based on the information provided at your station, how many bales will she need to purchase, what will be her cost, and per pot cost of the media?

- A. 92 bales, total cost of \$1,340.00, per pot cost of \$.70
- B. 90 bales, total cost of \$1,468.80, per pot cost of \$.73**
- C. 88 bales, total cost of \$1,408.00, per cost of \$.70
- D. 90 bales, total cost of \$1,440.00, per cost of \$.72

Number of Pots that can be Filled from 1 Cubic Foot of Root Medium

Pot Size (inches)	Number/ft ³
Standard Type	
2 ¹ / ₄	296
2 ¹ / ₂	176
3	120
4	44
5	24
6	14
7	9
8	5.6
12	1.6
Azalea Type	
	64
4	32
5	18
6	15
6 ¹ / ₂	
Low Pan	
5	40
6	31
7	14

Solution:

Standard, 8" pots are to be used. From the information provided at the students' station, from 1 cubic foot of root medium, 5.6 standard 8" pots can be filled.

About 358 cubic feet of root medium is required to fill 2,000 pots. This is approximately 90 bales, 90 bales at \$16.32 each is \$1,468.8 Cost per pot is \$.73.

Section B is the best answer.

Retail Pricing Example

Situation:

Use the retail cost of goods method of pricing to determine how much a cascade bouquet should be sold for if it contains the following materials. Wholesale prices are given in parentheses.

The profit percentage is 20%, and the markup ratios are 2 to 1 for supplies and hard goods, and 3 to 1 for flowers and foliage.

Number 9 satin ribbon	(\$.93)
Roses	(\$5.72)
Mini carnations	(\$1.65)
Green floral tape	(\$1.30)
Long stem sprengeri fern	(\$1.20)
Salal stems	(\$1.52)
Solid aster stems	(\$2.24)
Lily stems	(\$2.67)
Foam bouquet holder	(\$1.30)
Floral stand	(\$7.00)
Poly/lace bouquet backing	(\$1.06)

The bouquet should be sold for:

- A. \$82.23
- B. \$84.42
- C. \$80.25
- D. \$84.22**

Solution:

<u>Materials</u>	<u>Wholesale Cost</u>	<u>Markup Ratio</u>	<u>Retail Cost</u>
Number 9 Satin Ribbon	\$.93	x2	\$ 1.86
Roses	5.72	x3	17.16
Mini carnations	1.65	x3	4.95
Green floral tape	1.30	x2	2.60
Long stem sprengeri fem	1.20	x3	3.60
Salal stems	1.52	x3	4.56
Solid aster stems	2.24	x3	6.72
Lily stems	2.67	x3	8.01
Foam bouquet holder	1.30	x2	2.60
Floral Stand	8.00	x2	16.00
Polyllace bouquet backing	1.06	x2	2.12

Total Retail Cost of Materials = \$70.18 x 0.20 (20% profit) = \$14.04

Total Retail Cost of Materials + Profit = \$84.22 = Retail Selling Price

Safety Example:

Situation:

While working at a nursery and wholesale florist office, you receive a call from the nursery foreman. He explains that the crew is about to spray with DePesto Tranziapon Insect Spray and have encountered a problem. It appears that while the container was being hauled in the spray truck, the label was destroyed to a point where it cannot be read. They need some critical data from the label so he wants you to check the label from a container in the office. Knowing that you are relatively new on the job, he stresses that you need to write down the information he needs in order and reference what section of the label you got the information from. In the order to be answered, his questions are:

What type of mites will it treat? Is there any danger to aquatic organisms from runoff? If accidentally swallowed, should you immediately induce vomiting? What are the PPE and REI guidelines?

After checking the label you provide him with the following information:

- A. The treated areas should not be entered for 72 hours as stated in Directions for Use section. It is recommended for Red Mites as stated on front label. You should always induce vomiting as stated in First Aid Section. It is safe for fish as long as not directly applied.
- B. It is for Red Spider Mites according to Front Label. There is no danger to fish as long as it is not directly applied according to First/ Statement of Practical treatment. Never induce vomiting according to same section. You should wear long sleeved shirt and long pants, waterproof gloves, shoes plus socks and protective headgear according to PPE section.
- C. It is important to wear long-sleeved shirt, long pants, waterproof gloves, a chemical resistant headgear and shoes with socks. This is covered in Personal Protective Equipment section. The restricted entry interval is 72 hours as stated in special Cautionary Information Section. The product is indicated for Red Spider Mites according to front label. The Environmental Hazard Section states that drift or runoff may be hazardous to aquatic life.
- D. It is applicable to Red Spider Mites according to front label. Drift and runoff may be hazardous to aquatic organisms according to Environmental Hazard section. If swallowed, drink one or two glasses of water and induce vomiting. The exception would be if the victim is unconscious as illustrated in First Aid / Statement of Practical Treatment section. According to Personal Protective Equipment Section, one should wear long-sleeved shirt and long pants with shoes and socks as well as chemical resistant headgear and waterproof gloves. According to the Agricultural Use Requirement section, the REI states do not enter for 72 hours.**

SAMPLE LABEL PAGE 1 OF 2

FRONT PANEL

SIDE PANEL

<p>4.8 E. C. MAKES UP TO 24 GALLONS</p> <p>DILUTED SPRAY</p> <hr/> <p>DePESTO</p> <hr/> <p>TRANZIAPON INSECT SPRAY</p>		<p>FIRST AID/ STATEMENT OF PRACTICAL TREATMENT</p> <p>Organophosphate If swallowed: call a physician or poison control center immediately. Drink one or two glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person. If on skin: Wash with plenty of water. Get medical attention if irritation persists. If in eyes: Flush with plenty of water for 15 minutes. Get medical attention if irritation persists. If inhaled: Remove victim to fresh air if symptoms of cholinesterase inhibition appear and get medical attention immediately.</p>
<p>KILLS INSECTS:</p> <ul style="list-style-type: none"> • APHIDS • RED SPIDER MITES • FLIES 	<p>ACTIVE INGREDIENTS BY WT.</p> <p>Tranziapon* . . . 49%</p> <p>Aromatic Petroleum Derivative Solvent . . . 34%</p>	<p>Note to physician: TRANZIAPON is a cholinesterase inhibitor. Treat systematically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes such as 2-PAM/Protopam, are therapeutic if used early; however, used only in conjunction with atropine. In case of a severe acute poisoning, use antidote after establishing an open air way and respiration.</p>
<ul style="list-style-type: none"> • MEALYBUGS • SCALES AND HOUSEHOLD PESTS <p>EPA Reg. No. 111-22-3 EPA Est. No.:0000</p>	<p>Inert Ingredients . . . 17%</p> <p>*3,3 Ditransudate of cismercapto pontificate</p> <p>Product # 22222 Batch # 34-N34</p>	<p>ENVIRONMENTAL HAZARD</p> <p>This pesticide is toxic to birds and wildlife, and extremely toxic to fish and aquatic organisms. Do not apply directly to water or to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms and adjacent aquatic sites. Do not contaminate water when disposing of equipment wash waters. This product is highly toxic to bees exposed to direct treatment or to residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. In case of emergency to health or the environment involving this product, call collect 517-636-4400. Do not ship or store with food, feed, drugs or clothing.</p>
<p>CAUTION: KEEP OUT OF REACH OF CHILDREN See back panel for additional cautions</p> <hr/> <p>NET CONTENTS 8 FL. OZ.</p> <p>CONTAINS 4.8 LBS OF TRANZIAPON PER GALLON</p>		<p>PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS KEEP OUT OF REACH OF CHILDREN CAUTION/AVISO</p> <p>Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.) May be fatal if swallowed * Harmful if inhaled or absorbed through skin * Causes eye irritation.</p> <p>Do not get in eyes, on skin or clothing. Avoid breathing spray mists. Keep away from food, foodstuffs, and water supplies.</p>

SEE NEXT PAGE FOR THE REMAINING PORTION OF THE LABEL.

DEPESTO SAMPLE LABEL PAGE 2 OF 2

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

HOUSEHOLD AND TURF PESTS (Roaches, Ants, Fleas): 2 tablespoons per gallon of water. Spray on areas frequented by insects. Avoid contamination of food, dishes, utensils, and water. Repeat as necessary. Do not use in food preparation areas or in edible product areas of food processing plants.

VEGETABLES: Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Kale, Beans, Peas, and Potatoes (Aptids, Scales, and Mealybugs): 1 tablespoon per gallon water. Do not apply to beans within one day of harvest. Do not apply to broccoli and peas within three days of harvest and to brussel sprouts, cabbage, cauliflower, or kale within seven days of harvest. Applicators may use Depesto on potatoes up to harvest.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

WPS uses: applicators and other handlers who handle this pesticide for any use covered by the worker protection standard (40 CFR part 170) -- in general and agricultural-plant users are covered - must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- Chemical resistant headgear for over head exposure

Non-WPS uses: applicators and other handlers who handle this pesticide for any use not covered by the worker protection standard (40 CFR part 170)-in general, only agricultural plant uses are covered by the WPS-must wear:

- When exposure to spray mist is likely to occur, protective equipment and clothing:
 - Long-sleeved shirt and long pants
 - Eye Protection
 - Waterproof gloves

To prevent breathing spray mist during application in confined areas, wear a respirator and cartridge(s) approved by MSHA/NIOSH for pesticides (approval number prefixes TC-21C or P99).

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturers' instructions for cleaning/maintaining PPE. If there are no instructions for washing PPE, use hot water and detergent. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users Should:
 Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
 Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

CHEMICO CHEMICAL COMPANY
 10000 MAIN STREET LAROSA, TEXAS

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

Storage: Store in original container in a secured dry storage area. Prevent cross contamination with other pesticides and fertilizers. Do not store above 122 degrees Fahrenheit for extended periods. Use product immediately from damaged container or dispose of product and damaged container as indicated below.

Do not store below 32 degrees Fahrenheit.
Pesticide disposal: Waste resulting from the use of this product may be disposed of on the site or at an approved waste disposal facility.

Container disposal: Triple or pressure rinse and puncture. Then offer for recycling or disposal at a sanitary landfill or by other procedures approved by state and local authorities.

Agricultural Use Requirements

Use this product only in accordance with its label and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses; and handlers of agricultural pesticides. It contains requirements for training, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 72 hours.

PPE required to wear for early entry into treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Waterproof gloves
- Shoes plus socks
- Chemical resistant headgear for overhead exposure

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Adults, children, and pets should not contact treated surfaces until the spray has dried.

Production Example

Situation:

You have decided to grow a spring crop of coleus and large flowered marigold this year. You seeded .5 oz of coleus and 1 oz of marigold. Each has an 80% yield of viable seedlings. Both were seeded the first week of January. The temperature of the germination media was maintained at 75 degrees F. It is now one month after seeding. According to the information provided at your station, how many 18 count flats of coleus and marigolds would you expect to produce and what steps should now be taken?

- A. 1. 5,500 flats of coleus and 110 flats of marigolds will be produced
2. Grow-on the coleus for another four days
3. The marigolds are ready for hardening
- B 1. 2,444 flats of coleus and 400 flats of marigolds will be produced**
2. Harden the coleus for about a week
3. Transplant the marigolds this week
- C 1. 2,444 flats of coleus and 400 flats of marigolds will be produced
2. Increase soil temperature to raise coleus germination percent
3. Reseed the marigold crop and raise soil temperature to 85 degrees F.
- D 1. 2,444 flats of coleus and 405 flats of marigolds will be produced
2. Prepare to sell the coleus in one month
3. Continue to grow-on the marigolds for several days

Sample of schedules for various commonly grown ornamental plants

Plant	Seeding Date	Germination (emergence)		Growing-on		Hardening		Transplanting		Selling Period
		Days	Temp.°F	Days	Temp.°F	Days	Temp.°F	Date	Temp.°F	
Ageratum	1/7	6	75 to 80	10	60 to 65	10	50 to 55	2/2	60	April 10 to 20
	3/31	5	75 to 80	8	65+	8	65+	4/21	65+	May 10 to 20
Alyssum	1/26	4	75	10	60 to 65	5	50 to 55	2/18	60 to 65	April 10 to 20
	3/31	4	75	5	65	10	50 to 55	4/19	60	May 10 to 20
Aster	2/22	4	75	10	60 to 65	--	--	3/7	60 to 65	April 15 to 20
	4/1	4	75	10	60 to 65	--	--	4/15	65	May 10 to 20
Begonia	12/12	21	75 to 80	21	60	--	--	1/23	60	April 12 to May 1
Coleus	1/5	8	75 to 80	20	60 to 65	7	55 to 60	2/11	62 to 65	April 10 to 20
	3/31	5	75 to 80	12	65	--	--	4/20	62-	May 10 to 20
Dusty Miller	12/15	18	75 to 80	21	60	--	--	1/28	60	April 10 to 20
Geranium (seed)	1/2	6	75 to 80	21	60	--	--	2/4	60	April 12 to 30
Impatiens	1/3	6	80	21	60	--	--	2/4	62	April 12 to 30
Marigold -Dwarfs	1/5	8	70 to 75	10	60	12	50 to 55	3/8	60	April 10 to 20
	1/5	8	70 to 75	10	60	12	50 to 55	2/8	60	April 10 to 20
-Large flowered	4/1	6	70 to 75	6	60 to 65	10	60	4/23	60	May 10 to 20
	4/1	6	70 to 75	6	60 to 65	10	60	4/23	60	May 10 to 20
Pansy	10/16	10	75	15	55 to 60	12	45 to 50	11/23	50 to 55	March 20 to April 20
	11/6	10	75	15	55 to 60	12	45 to 50	12/15	50 to 55	March 30 to April 25
	1/14	7	75 to 78	7	55 to 60	12 to 20	50 to 55	2/15 to 20	58	April 15 to May 1
Petunia and Snapdragon	11/20	6	75	10	60	16	45 to 50	12/22	60	March 25 to April 5
	12/3	5	75	7	55 to 60	16	45 to 50	1/4	60	April 10 to 20
	12/12	5	55	7	55 to 60	16	45 to 50	1/9	60	April 20
	1/7	5	75	5	55 to 60	12	45 to 50	1/30	60	April 30 to May 5
	2/25	5	75	5	55 to 60	12	55 to 60	3/18	60	May 5 to 12
	3/15	5	75	5	55 to 60	12	55 to 60	4/6	60	May 15 to 18
	4/1	5	75	5	55 to 60	12	60	4/21	60	May 25
	4/7	5	75	5	55 to 60	12	60	4/29	60	May 27 to June 2
Phlox	12/21	12	65	21	55 to 60	--	--	2/1	55	April 15 to May 5
Portulaca	1/24	4	75	14	60 to 65	12	55 to 55	2/25	60	April 20 to 30
	3/31	4	75	8	--	--	--	4/14	65	May 10 to 20
Salvia	1/24	6	75 to 80	6	55 to 60	6	50 to 55	2/12	60	April 10
	3/31	6	75 to 80	8	60 to 65	--	--	4/14	65	May 10 to 20
Verbena	12/29	7	75	21	55 to 60	14	55	2/1	55 to 58	April 15 to May 1
Vinca	12/15	12	75 to 80	3	55 to 60	14	55 to 60	2/15	60+	May 1 to June 1

[Source: *Tips on Growing Bedding Plants*, second edition, Ohio Cooperative Extension Service, The Ohio State University, 1989]

Seed Information and Production Schedules for Selected Annuals

Common name	Scientific name	Approximate seeds per ounce	Germination light requirement ^a	Germination soil temperature (°F)	Germination time (days)
African Daisy	<i>Dimorphotheca aurantiaca</i>	10,000	D	60-70	7-15
Ageratum	<i>Ageratum houstonianum</i>	200,000	D or L	70-80	7-10
Alyssum	<i>Lobularia maritima</i>	90,000	D or L	75-79	7-15
Amaranthus	<i>Amaranthus tricolor</i>	45,000	D or L	70-75	8-10
Aster (China)	<i>Callistephus chinensis</i>	12,000	L	70-80	8-10
Baby's breath	<i>Gypsophila elegans</i>	25,000	D or L	70-80	10-14
Begonia (fibrous)	<i>Begonia</i> × <i>semperflorens</i>	2,000,000	L	70-75	14-21
Begonia (tubercus)	<i>Begonia</i> × <i>tuberhybrida</i>	2,000,000	L	65	15-20
Browallia	<i>Browallia speciosa</i>	125,000	L	75	7-10
Candytuft	<i>Iberis coronaria</i>	9,500	D or L	70	7-14
Celosia (crested)	<i>Celosia cristata</i>	34,000	L	75	5-10
Celosia (feathered)	<i>Celosia plumosa</i>	39,000	L	75	5-10
Chinese forget-me-not	<i>Cynoglossum amabile</i>	5,000	D	60-70	5-10
Clarkia	<i>Clarkia elegans</i>	90,000	L	65-70	5-14
Cleome	<i>Cleome spinosa</i>	12,500	D or L	60* (night) 85* (day)	7-21
Coleus	<i>Coleus</i> × <i>hybridus</i>	110,000	L	65-75	10-15
Cornflower	<i>Centaurea cyanus</i>	7,000	D	65-70	10-15
Cosmos	<i>Cosmos bipinnatus</i>	5,000	L	70-75	5-14
Dahlia	<i>Dahlia</i> × <i>hybrida</i>	2,800	D or L	79-80	7-10
Dusty miller	<i>Senecio cineraria</i>	90,000	L	72-75	10-15
Forget-me-not	<i>Myosotis aplestris</i>	44,000	D	55	10-14
Gaillardia	<i>Gaillardia pulchella</i>	15,000	L	70-80	15-20
Garden pinks	<i>Dianthus chinensis</i>	25,000	D or L	70-75	5-7
Geranium	<i>Pelargonium</i> × <i>hortorum</i>	6,200	L	70-75	5-12
Gomphrena	<i>Gomphrena globosa</i>	5,000	D	70-80	14-20
Impatiens	<i>Impatiens welleriana</i>	52,000	L	70-75	15-18
Lobelia	<i>Lobelia erinus</i>	1,000,000	D or L	75-80	6-20
Marigold (African)	<i>Tagetes erecta</i>	9,000	D or L	75-80	5-8
Marigold (French)	<i>Tagetes patula</i>	9,000	D or L	75-80	5-8
Morning glory	<i>Ipomoea purpurea</i>	1,000	D or L	80	7-14
Moss rose	<i>Portulaca grandiflora</i>	280,000	D or L	75-80	7-10
Nasturtium	<i>Tropaeolum major</i>	175	D	65	10-15
Nicotiana	<i>Nicotiana glauca</i>	200,000	L	70	7-14
Pansy	<i>Viola</i> × <i>wittrockiana</i>	20,000	D	63-68	7-14
Periwinkle	<i>Catharanthus roseus</i>	10,000	D	75-85	10-15

Solution

The reference material for this question is found in *Introduction to Floriculture*, page 518-520, and *An Introduction to Greenhouse Production*, page 202.

The correct response is B. One-half oz of coleus contains approximately 110,000 seeds divided by 2 = 55,000 seeds. At 80% viable seedlings, $.80 \times 55,000 = 44,000$ seedlings. Using 18 count flats, 44,000 divided by 18 = 2,444 flats.

One oz of marigold contains approximately 9,000 seeds. At 80% viable seedlings, $.80 \times 9,000 = 7,200$ seedlings. Using 18 count flats, 7,200 divided by 18 = 400 flats.

The coleus, according to the growing schedule, have about 5 more days to harden off. The marigolds have completed hardening and are ready to transplant.

Fertilizer example

Situation:

Using the information below, solve the following problem:

A grower with a 1:150 ratio fertilizer injector and a 40-gallon stock tank desires to apply 300 ppm of nitrogen to a crop of mums. The available fertilizer has a 25-15-20 analysis.

How many pounds of this fertilizer should the grower dissolve in the stock tank?

Two formulas for calculating fertilizer amounts are:

$$1. \text{ Ounces in 100 gallons of water} = \frac{\text{ppm desired}}{\% \text{ element} \times \text{correction factor}^* \times 0.75}$$

$$2. \text{ Pounds to add to stock tank} = \frac{\text{ounces per 100 gallons} \times \text{second number of injector ratio}}{100 \times 16} \times \text{volume of stock tank in gallons}$$

*Correction factors: % P₂O₅ x 0.44 = %P, and %K₂O x 0.83 = %K.

- A. 62 pounds
- B. 75 pounds
- C. 60 pounds
- D. 162 pounds

Reference is pg 151 and 152 in An Introduction to Greenhouse Production

1. The fertilizer contains 25% nitrogen by weight. Substituting in the first formula gives:

$$\text{ounces in 100 gallons of water} = \frac{300}{25 \times 0.75} = \frac{300}{18.75} = 16$$

There is no correction factor needed with nitrogen.

2. Substituting in the second formula gives:

$$\text{pounds to add to stock tank} = \frac{16 \times 150 \times 40}{100 \times 16} = \frac{96,000}{1,600} = 60$$

The grower must dissolve 60 pounds of the 25-15-20 fertilizer in the 40 gallon stock tank, and the 1:150 injector will produce a solution of 300 ppm nitrogen in the irrigation water.

Problem solving- Plant Selection Example



1



2

Using your knowledge of plant selection. Choose the statement that is most correct.

- A. Plant number 1 is better because it has more flowers.
- B. Plant number 1 is better because its leaves have more shine.
- C. Plant number 2 is better because it is more balanced**
- D. Plant number 2 is better because it has smaller leaves

Problem Solving- Design example



1



2

Using your knowledge of the Principles of Design, which statement is most correct

- A. Design 1 has a more clearly defined focal point**
- B. Design 2 has better rhythm
- C. Design 1 has a balance problem
- D. Design 2 has a more clearly defined form.