1. **BEEF PRODUCTION-E/P**
   a. do adjusted weaning weights for selecting herd replacements
   b. rate of gain
   c. feed conversion rates--------lbs of feed to make a pound of gain
   d. contracting market steer sales
   e. veterinary skills such as vaccination, castration, hoof work
   f. practices such as fly control, lice and mange treatment
   g. selecting breeding stock for the herd (bulls and replacement heifers/cows)
   h. artificial insemination
   i. feeding and mixing rations
   j. keeping records
   k. registration of purebred animals/membership in breed associations
   l. record keeping
   m. feed conversions and rates of gain

2. **DAIRY PRODUCTION-E/P**
   a. artificial insemination
   b. reading and interpreting all production records as well as taking milk samples
   c. use of records to select heifer replacements
   d. feeding and using TMR’s in the herd feeding program
   e. sire selection and genetic mating skills to improve production and type
   g. milking procedures
   h. sanitation in the milk house and during milking
   i. all veterinary procedures such as vaccination, treating mastitis, giving shots, etc.
   j. raising heifers
   k. contracting milk
   l. registration of purebred animals/breed association membership
   m. record keeping

3. **SWINE PRODUCTION-E/P**
   a. artificial insemination
   b. veterinary skills such as clipping needle teeth, castration, vaccination, clipping tails. Etc.
   c. boar and gilt selection
   d. mixing rations and feeding different age groups of swine
   e. contract sales of market hogs and other marketing methods
   f. breeding systems such as rotational crossing to maximize heterosis
   g. identification methods such as earnotching
   h. registration of purebred animals/breed association membership
   i. use of practices such as measuring loin eye
   j. showmanship skills to enhance possible sale of breeding stock
   k. record keeping
   l. feed efficiency and rates of gain

4. **GRAIN PRODUCTION-E/P**
   a. soil testing and reading the results
   b. using soil test results to develop a fertility program
   c. moisture testing
   d. use of no-til vs conventional til tillage methods the results
   e. disease and insect recognition/treatment
   f. obtain your pesticide certification license
   g. running the dryer for drying the grain
   h. operating the storage facility
   i. obtaining your commercial driving license (CDL) to haul grain to market
   j. marketing programs
   h. use of genetically modified seeds and its benefits
   i. yield measuring
   j. record keeping
5. TURF GRASS MANAGEMENT-E/P
   a. different lawn mowing techniques
   b. care of machinery and equipment
   c. soil testing of lawns
   d. reading/interpreting soil test results to make recommendations
   e. establishing lawns
   f. selecting the right varieties of grass seed for different lawns
   g. recognizing disease and insect problems of lawns
   h. use of other lawn tools such as an edger, leaf blower, aerator, etc.
   i. basic pruning of lawn shrubs
   j. disposal of lawn clippings (bagged and removed or mulched)
   m. record keeping

6. AGRICULTURAL COMMUNICATIONS-E/P
   a. writing newsletter articles for your chapter
   b. maintaining the chapter scrapbook
   c. writing and mailing thank yous for chapter donors
   d. establishing and maintaining chapter databases involving
      -donors
      -membership
      -sales records
      -chapter activities
   e. creating a webpage for the chapter
   f. being editor of the chapter newsletter (quarterly and for FFA Week)
   g. writing news releases for chapter activities sent to the paper
   h. giving presentations to area groups such as the Chamber of Commerce, Kiwanis, etc.
   i. handling the mailing of all chapter business communications
   j. doing a weekly or bi-weekly update of chapter activities for the administration
   m. record keeping

7. FRUIT PRODUCTION-E/P
   a. laying out the garden/field/orchard
   b. getting a pesticide application license and applying pesticides
   c. establishing new plantings or trees (variety selection)
   d. pruning trees
   e. harvesting and preparing for sale
   f. packaging
   g. marketing (setting up roadside stands, delivering to groceries, wholesale contracts)
   h. contacting potential customers
   i. tillage and weed control
   j. recognizing disease and insect problems
   k. advertising
   l. record keeping

8. NURSERY PRODUCTION-E/P
   a. pruning for developing saleable nursery stock
   b. disease and insect identification
   c. irrigation knowledge
   d. propagation of perennials
   e. obtaining a pesticide certification license
   f. use of fertilizers
   g. harvest of nursery stock in the fall and spring
   h. working in sales in the nursery plant yard
   i. tagging and identification of nursery stock
   j. maintaining nursery equipment
   k. identifying common nursery stock
   l. customer assistance in nursery stock selection and care
   m. knowledge of how to care for harvested nursery stock
   n. record keeping
9. LANDSCAPE MANAGEMENT-E/P
   a. identification of plants and trees selected for landscape projects
   b. characteristics of plants selected for a landscape project
   c. ability to operate equipment used in landscaping
   d. repair and maintenance of landscape equipment
   e. drawing the landscape plan/computer assisted landscape drafting programs
   f. selection of landscape materials other than plants; timbers, bricks, a trellis, etc.
   g. figuring a bill of materials/doing estimates for landscape jobs
   h. soil testing and interpreting the results
   i. establishing a lawn
   j. communication with customers
   k. ability to survey a lot or any area and read the plat books to make sure the property is correctly laid out
   l. record keeping

10. VEGETABLE PRODUCTION-E/P
    a. variety selection
    b. obtaining your pesticide license
    c. Identification of diseases and insects
    d. use and care of equipment used in vegetable production
    e. harvesting vegetables
    f. preparing vegetables for market
    g. laying out the garden or fields where vegetables are grown.
    h. marketing the crop-----direct markets, roadside stands, contracting
    i. soil testing and interpreting the results
    j. communication/sales skills
    k. advertising
    l. tillage, weed control, use of mulches
    m. record keeping

11. FLORICULTURE-E/P
    a. cutting flowers
    b. arranging flowers
    c. preparing displays
    d. flower identification
    e. knowledge of flowers and how they fit into displays
    f. growing a flower crop and the associated skills
       -soil testing
       -operation of flower garden equipment
       -tillage
       -pest control
       -times to cut the flowers
       -identification of pests—diseases, insects, fungus, etc
    g. drying flowers
    h. sales/marketing skills
    i. communication
    j. record keeping

12. EQUINE SCIENCE-E/P
    a. record keeping
    b. grooming
    c. exercising horses
    d. training horses
    e. care of feet and legs
    f. feeding
    g. selecting mares or stallions in the breeding program
    h. all minor veterinary practices
    i. care of all tack items (includes repair/oiling/inventory)
    j. maintain medical inventory and logs
    k. communication
    l. riding safety
    m. assist with foaling
    n. riding skills
    o. horse show competitions
13. **POULTRY PRODUCTION-E/P**
   a. record keeping
   b. disease and pest identification
   c. poultry health problems
      -preventive measures
      -treatments
   d. feeding of different poultry types
      -meat animals
      -laying animals
   e. breed selection
   f. housing of poultry (types)
   g. organically raised poultry as a niche market
   h. feed conversions/ration formulations
   i. egg production records
   j. marketing
      -home slaughter and use
      -commercial marketing
   k. processing methods
   l. advertising
   m. meat type chickens vs laying enterprises
   n. customer contacts
   o. advertising

14. **AGRICULTURAL SALES-E/P**
   a. inventory
   b. running the cash register
   c. direct sales contact with customers
   d. communication
   e. knowledge of the business and products
   f. work attendance
   g. knowledge of all machinery operation in the business
      -passed all safety tests
      -maintain and repair
   h. display set up
   i. making signs
   j. company records
   k. handling money and banking
   l. making change
   m. product pricing
   n. receive and store sales inventory
   o. computer use
   p. input on sales flyers/advertising
   q. good telephone skills
   r. understand and use product manuals
   s. keep store/cooperative work areas clean
   t. ability to listen and explain
   u. knowledge of other companies in the same business
   v. financial records
      -net worth statements
      -balance sheets
      -depreciation schedules
      -cash flow projections
      -reconciliation of daily/weekly/monthly receipts
   w. bills of lading
   x. invoicing
15. HOME AND/OR COMMUNITY DEVELOPMENT-E/P

a. map and identify community resources
b. inventory community and home improvement areas
c. volunteer for work with the Chamber of Commerce
d. plant trees/shrubs where the village governing body would like them
e. paint/repair park equipment
f. volunteer work for helping organizations in the community
   - chaperone girl scout and boy scout outings
   - spend time working at the area nursing home
   - assist day care workers with children’s games
   - work with other high school groups in their activities
g. road side clean up volunteer
h. assist community in times of disaster
   - floods
   - fires
   - snow damage
   - tornado and other wind damage
   - other storm clean up
i. repair and paint your home and buildings
j. create play areas in the park
k. approach village governing body about new projects for the community and volunteer
   to work in their completion
   - horse shoe pits for the park
   - new volleyball courts
   - new tennis courts
   - new playground equipment
l. create community flower beds and ask each community group to tend one
m. create raised flower beds or raised garden beds for the area nursing home so the residents in
   wheel chairs can access them
n. as part of the FFA, chair the creation of a chore corps to help people in need of services they
   can not perform themselves
o. do street and park clean up chores
p. build park and street benches for your community
q. build flower containers for village businesses
r. soil test the park for your community and prepare a report for the village governing body
   with respect to fertilizer recommendations
s. volunteer to paint fire hydrants for your community
t. landscape the library or other public place in your community
u. landscape your home
v. create a nature trail with signs regarding plants and animals in the area
w. make or redo a sign for your village identifying it
x. volunteer to create a webpage for your community
y. rewire an older building on your farm or at your business
z. create a long range plan for your home or community regarding possible improvements
16. ENVIRONMENTAL SCIENCE AND NATURAL RESOURCES MANAGEMENT-E/P
   a. create a farm pond or duck scrape
   b. plant wildlife vegetation to increase habitat for wildlife species in your area
   c. keep records on all projects for this SAE
   d. do water testing to determine oxygen content, pH, nitrate contents
   e. identify wildlife species in the area you work with in this SAE
   f. identify wildlife tracks
   g. do a game census for your land area
   h. learn to operate land shaping equipment such as a tractor and blade, a bulldozer, etc.
   i. do land measurements to determine acreage
   j. take a soil sample on the land
   k. identify plant species which fit the animals in the area
   l. build and install bird houses
   m. learn to use a transit for reading land elevations
   n. create a long range plan for improving the area
   o. meet with related professionals for input regarding your plan
      - game warden
      - extension professionals on land reclamation, soils, and crops
      - department of natural resources
   p. make brush piles for wildlife habitat
   q. plant wildlife food plots
   r. establish prairie areas and plant them with native vegetation

17. AGRICULTURAL MECHANICS DESIGN & FABRICATION-E/P
   a. learn to operate all shop power equipment
   b. repair and maintain all equipment in the shop
   c. learn about how to install a wire harness
   d. learn to read blue prints
   e. be skilled at reading all measuring equipment
   f. be skilled in working with different metals and know their properties
   g. be safety certified on all shop equipment
   h. do not work alone in the shop, if at all possible
   i. be skilled at all welding types
   j. know how to use all hand tools in the shop
   k. understand and maintain the shop’s inventory
   l. field test all equipment designed for farm use
   m. wear proper safety equipment
   n. maintain a record of all shop work completed by using a good record book

18. SMALL ANIMAL PRODUCTION AND CARE-E/P
   a. practice sanitation for all animals in your care
   b. learn to give shots and vaccinations
   c. trim dog nails
   d. exercise pets
   e. teach dog and/or other pet obedience
   f. assist with surgery prep-veterinary clinic
   g. assist with surgery-veterinary clinic
   h. be able to identify animal parasites
   i. know the rations needed for each age group of pets
   j. handle inventory items in the pet store or clinic where you work
      - price items
      - stock shelves
   k. handle cash transactions for purchases and be able to answer product questions from customers
   l. identify breeds of small animals and know their characteristics
   m. become skilled in lab work areas such as autopsies for animals that died
   n. be able to invoice customers for a purchase in a pet store or vet clinic
   o. practice communication skills for working with customers
   p. become skilled in animal disease and parasite diagnosis
   q. be able to package samples sent into the state health lab for special diagnosis assistance
   r. work with special animal projects such as training companion animals
   s. keep good records in all areas; your own pets and your work at a veterinary clinic or pet store
   t. have good work attendance
<table>
<thead>
<tr>
<th><strong>COMMERCIAL HEIFER RAISING-P</strong></th>
<th><strong>MANURE HANDLING BUSINESS-E</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. prepare contracts with the farmers served</td>
<td>a. prepare &amp; sign customer contracts</td>
</tr>
<tr>
<td>b. do minor veterinary practices on all heifer calves</td>
<td>b. know manure fertilizer values</td>
</tr>
<tr>
<td>- remove extra teats</td>
<td>c. equipment repair and maintenance</td>
</tr>
<tr>
<td>- dehorn</td>
<td>d. equipment fabrication</td>
</tr>
<tr>
<td>- treat lice/mange problems</td>
<td>e. customer relations</td>
</tr>
<tr>
<td>- give shots</td>
<td>f. develop cash flow projections</td>
</tr>
<tr>
<td>- vaccinations</td>
<td>g. set prices per gallon of manure pumped</td>
</tr>
<tr>
<td>- treat foot and leg problems</td>
<td>h. estimating gallons of manure per pit</td>
</tr>
<tr>
<td>c. balance rations</td>
<td>i. incorporating manure</td>
</tr>
<tr>
<td>d. sire selection for breeding heifers</td>
<td>j. proper agitation of manure before pumping</td>
</tr>
<tr>
<td>e. learn artificial insemination</td>
<td>k. estimating cost per gallon to pump manure</td>
</tr>
<tr>
<td>f. sanitation procedures</td>
<td>l. maintain an inventory of supplies for the business</td>
</tr>
<tr>
<td>g. mixing milk replacer</td>
<td>m. ordering supplies</td>
</tr>
<tr>
<td>h. use of calf hutches to lessen disease/sickness</td>
<td>n. advertising the business</td>
</tr>
<tr>
<td>- dehorn</td>
<td>- referrals</td>
</tr>
<tr>
<td>- bulk purchasing for discount pricing</td>
<td>- flyers</td>
</tr>
<tr>
<td>i. grouping calves by size when raising them</td>
<td>- ad layouts</td>
</tr>
<tr>
<td>j. calf identification techniques</td>
<td>- ads in state ag newspapers</td>
</tr>
<tr>
<td>k. forage test all hay for feed analysis</td>
<td>o. prepare balance sheet</td>
</tr>
<tr>
<td>l. maintain good records</td>
<td>p. prepare net worth statement</td>
</tr>
<tr>
<td>m. practice good safety habits</td>
<td>q. prepare information for tax preparation</td>
</tr>
<tr>
<td>n. use rotational grazing</td>
<td>r. develop and update business plan</td>
</tr>
<tr>
<td>o. measure and layout grazing fields</td>
<td>s. use financial information for meetings with the banker regarding loans</td>
</tr>
<tr>
<td>p. advertising</td>
<td>t. preparing payroll information for employee wages</td>
</tr>
<tr>
<td>q. customer relations</td>
<td>u. handling employees</td>
</tr>
<tr>
<td>r. equipment maintenance and repair</td>
<td>v. safety instruction</td>
</tr>
<tr>
<td>s. fencing skills (regular fencing &amp; electric)</td>
<td>- equipment operation</td>
</tr>
<tr>
<td>t. obtain a CDL (Commercial Driver’s License)</td>
<td>- manure gas dangers</td>
</tr>
<tr>
<td>u. become skilled in purchasing supplies</td>
<td>- posting instructions on equipment operation</td>
</tr>
<tr>
<td>- veterinary discounts</td>
<td>w. scheduling work</td>
</tr>
<tr>
<td>- bulk purchasing for discount pricing</td>
<td>- equipment for each job</td>
</tr>
<tr>
<td>v. daily checking of all heifers</td>
<td>- employees on each job</td>
</tr>
<tr>
<td>- health problems noted quicker</td>
<td>x. set up and take down for each manure pumping job</td>
</tr>
<tr>
<td>- heifers in heat detected better</td>
<td>y. knowledge of manure handling regulations in your state</td>
</tr>
<tr>
<td>z. invoicing</td>
<td></td>
</tr>
</tbody>
</table>
20. **WILDLIFE MANAGEMENT-E/P**

a. doing a game census  
b. planting wildlife shrubs  
c. planting trees  
d. creating brush piles for wildlife cover  
e. land measuring skills to determine acreage  
f. identification of wildlife species  
g. identification of wildlife signs  
   - tracks  
   - deer rubs  
   - deer scrapes  
   - nesting areas  
   - bedding areas  
h. knowledge of wildlife characteristics  
   - nocturnal or diurnal  
   - mating habits  
   - food requirements  
   - ranges of each wildlife species  
i. having your hunter safety certificate  
j. animal population control methods  
   - hunting  
   - trapping  
   - stocking pheasants/quail/wild turkeys  
k. knowledge of all hunting rules/regulations  
l. firearm and archery safety  
m. identification of plant species in the area  
n. establishing wildlife food plots  
o. banding released pheasants for identification purposes  
p. feeding young raised wildlife  
   - pheasants  
   - quail  
q. disease and pest identification  
r. soil testing to establish cover with better success  
s. fencing for young raised wildlife birds  
t. own land for no trespassing  
u. use of equipment in planting, mowing, and care of wildlife habitat

21. **SHEEP PRODUCTION-E/P**

a. breed identification  
b. characteristics of the breeds in your flock  
c. use of crossbreeding programs to improve lamb performance  
d. ram and ewe selection  
e. mixing rations  
f. marketing methods  
   - market lambs  
   - breeding stock  
   - show lambs  
g. identification methods  
h. registration of purebred animals  
i. checking carcass performance from fair animals  
j. showmanship skills to enhance possible sale of breeding stock  
k. record keeping  
l. selling wool as a value added product of this SAE  
m. shearing sheep  
n. figuring rates of gain  
o. figuring feed conversion rates  
p. balancing rations for different age groups and classifications of animals  
   - breeding stock  
   - market lambs  
   - gestating animals  
q. membership in breed associations
### OUTDOOR RECREATION-E/P (two examples)

#### POOL WORKER
- **a.** inventory of pool supplies
- **b.** giving swimming lessons
  - different swimming strokes
  - how to float
  - life saving
- **c.** doing water sampling
  - pH
  - chlorine content
  - bacteria content
- **d.** collecting and recording fees
- **e.** setting up pool games
- **f.** closing the pool
- **g.** adding chlorine to the pool water
- **h.** reading pool house gauges for
  - leakage/other problems
- **i.** equipment repair and maintenance
- **j.** establishing pool games for young
  - swimmers for recreational
  - swimming
- **k.** life guard certified
  - Level I
  - Level II
- **l.** posting rules
- **m.** people skills for maintaining order
  - problem solving
  - setting rules
  - removing rule violators
- **n.** safety precautions when working with elk
  - bulls temperament
  - aggressive cows with calves
- **o.** record keeping in all areas of the operation
- **p.** antler harvest
  - handling the velvet at harvest
  - storing the velvet to maintain quality
- **q.** marketing elk and velvet
- **r.** assisting the elk cows at calving
- **s.** chronic wasting disease prevention
- **t.** knowing all rules/regulations regarding raising elk
- **u.** join North American Elk Association
- **v.** use of breeding/handling chutes
- **w.** equipment maintenance/repair

#### CAMPGROUND DIRECTOR/YOUTH COUNSELOR
- **a.** inventory of campground supplies/equipment
- **b.** setting rules
- **c.** establishing camp games/activities
  - hiking
  - swimming
  - horseback riding
  - camp games such as volleyball/softball/etc
- **d.** winter camp activities
  - skiing
  - snowboarding
  - night camp activities director
- **e.** safe boating instruction
- **f.** rock climbing
- **g.** knot tying
- **h.** building a camp fire
- **i.** communication of rules
- **j.** plant and animal identification
- **k.** minor repairs to camp equipment
- **l.** opening/closing camp areas
  - stables
  - boat house
  - pool
  - hiking trails
  - rock climbing wall
- **m.** camp record keeping
- **n.** attendance/participation records

### SPECIALITY ANIMAL PRODUCTION-E/P

#### RAISING ELK
- **a.** bull and cow breeding stock selection
- **b.** mixing rations
- **c.** building fences
  - height of fence
  - double fencing to prevent outside contact
- **d.** tagging/identification of elk calves
- **e.** artificial insemination of elk cows
- **f.** selecting calves for herd replacement
  - animals
- **g.** taking hair samples for DNA verification
  - of parentage for registration
- **h.** registering animals with the breed association
- **i.** safety precautions when working with elk
  - bulls temperament
  - aggressive cows with calves
- **j.** record keeping in all areas of the operation
- **k.** antler harvest
  - handling the velvet at harvest
  - storing the velvet to maintain quality
- **l.** marketing elk and velvet
- **m.** assisting the elk cows at calving
- **n.** chronic wasting disease prevention
- **o.** knowing all rules/regulations regarding raising elk
- **p.** join North American Elk Association
- **q.** use of breeding/handling chutes
- **r.** equipment maintenance/repair
### 24. FIBER AND/OR OIL CROP PRODUCTION-E/P (2 examples)

<table>
<thead>
<tr>
<th>PEPPERMINT/SPEARMENT OIL PRODUCTION</th>
<th>SOYBEAN PRODUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. field tillage operations</td>
<td>a. field tillage operations</td>
</tr>
<tr>
<td>b. soil sampling</td>
<td>b. soil sampling</td>
</tr>
<tr>
<td>c. disease and insect identification</td>
<td>c. disease and insect identification</td>
</tr>
<tr>
<td>d. become pesticide certified</td>
<td>d. become pesticide certified</td>
</tr>
<tr>
<td>e. spraying</td>
<td>e. spraying</td>
</tr>
<tr>
<td>f. cutting and raking the mint</td>
<td>f. combining the crop</td>
</tr>
<tr>
<td>g. chopping the mint plants</td>
<td>g. drying the crop</td>
</tr>
<tr>
<td>h. distilling the oil</td>
<td>h. storage of the soybeans</td>
</tr>
<tr>
<td>i. storage of oil before selling</td>
<td>i. marketing</td>
</tr>
<tr>
<td>j. contracting the mint oil</td>
<td>j. repair and maintenance of equipment</td>
</tr>
<tr>
<td>k. propagation of mint stands</td>
<td>k. record keeping</td>
</tr>
<tr>
<td>l. multiple crops in one year</td>
<td>l. safety in all areas</td>
</tr>
<tr>
<td>m. repair and maintenance of equipment</td>
<td>n. crop rotation knowledge</td>
</tr>
<tr>
<td>n. knowledge of boiler operation</td>
<td>n. variety selection</td>
</tr>
<tr>
<td>o. fabrication of specialized equipment</td>
<td>o. use of round-up ready varieties</td>
</tr>
<tr>
<td>p. use of irrigation to establish mint stands on muck soils</td>
<td></td>
</tr>
<tr>
<td>q. knowledge of muck soils and their properties</td>
<td></td>
</tr>
<tr>
<td>r. record keeping</td>
<td>s. safety procedures</td>
</tr>
<tr>
<td>s. safety procedures</td>
<td></td>
</tr>
</tbody>
</table>

### 25. FORAGE PRODUCTION-E/P

| a. establishing the stand           | a. establishing the stand |
| b. tillage operations               | b. tillage operations    |
| c. soil testing                     | c. soil testing          |
| d. variety selection                | d. variety selection     |
| e. avoiding auto-toxicity (alfalfa) | e. avoiding auto-toxicity (alfalfa) |
| f. harvesting methods               | f. harvesting methods    |
| -baling                             | -baling                 |
| -chopping                           | -chopping               |
| -silage                             | -silage                 |
| -grazing                            | -grazing                |
| g. topdressing potash after first crop (alfalfa) | g. topdressing potash after first crop (alfalfa) |
| h. proper harvest moisture for silage (alfalfa/corn/other crops) | h. proper harvest moisture for silage (alfalfa/corn/other crops) |
| i. forage testing for relative feed value | i. forage testing for relative feed value |
| -hay                                | -hay                    |
| -silage                             | -silage                 |
| j. machinery repair and maintenance | j. machinery repair and maintenance |
| k. establishing long range field plan| k. establishing long range field plan |
| l. marketing the crop               | l. marketing the crop   |
| m. establishing the fertility program| m. establishing the fertility program |
| n. figuring storage capacity        | n. figuring storage capacity |
| -trench silos                       | -trench silos           |
| -upright silos                      | -upright silos          |
| -hay mow storage                    | -hay mow storage        |
| o. using feed values for ration recommendations | o. using feed values for ration recommendations |
| p. when to cut (every 28 days for alfalfa) | p. when to cut (every 28 days for alfalfa) |
| q. disease and insect identification| q. disease and insect identification |
| r. obtaining your pesticide license | r. obtaining your pesticide license |
26. **SPECIALTY CROP PRODUCTION-E/P**

**SEED PRODUCTION-P**

a. planting the test plots
b. keeping the varieties separated by identity
c. establishing a working uniform population for all varieties
   - plant all plots at 44,000 plants per acre
   - thin all plots to 32,000 plants per acre
d. producing replicated studies for each trait
e. inoculating inbreds for tolerance to problems
   - smut/stalk rot/etc
f. yield checks on the inbreds
g. pollinating the corn using silk and tassel bags to keep the lines pure
h. plot harvest
   - soybeans
   - alfalfa
   - clover
   - corn
i. recording data on:
   - stalk and root lodging
   - yield
   - corn borer infestation
   - insect damage
   - disease infestations
j. identification of disease and insect problems
k. obtaining a pesticide certification license
l. training new employees
m. preparing for the field day
n. putting in variety signs at the plot
o. keeping records
p. weeding the plots by hand where the spray didn’t work
q. assigning crew members to different jobs each day
r. bagging seed at the warehouse
s. tagging the seed bags
t. storing seeds
u. germination checks on harvested seed
v. laying out the test plots at the demonstration plot
w. working with genetically modified seed
x. answering questions during the field day
y. repair and maintenance of equipment used at the test plots
27. DIVERSIFIED HORTICULTURE-E/P
a. soil sampling
b. laying out a garden or test plot
c. planting nursery crops
d. pruning nursery stock
e. pruning fruit trees
f. establishing lawns
g. selecting grass seed for lawns
h. taking cuttings in the greenhouse
i. mixing soil for greenhouse flower production
j. use of fungicides as protectants or eradicants
k. obtain a pesticide license
l. potting annual flowers
m. designing baskets
n. arranging cut flowers
o. setting up displays in the garden center or in the nursery sales area
p. sales
q. identifying nursery, lawn, and flower species
r. mowing lawns
s. fertilizing lawns and gardens
t. mixing fertilizers
u. labeling plants
v. potting trees
w. working in the bare root room for storage of dormant perennials
x. customer relations and answering questions
y. sharpening mower blades
z. repair and maintenance of equipment
aa. use of irrigation equipment
bb. identification of disease and insect problems
cc. record keeping skills
dd. safety skills for pesticide use and equipment use
e. taking orders via phone at the nursery
ff. computer skills in database work and entering orders
gg. bagging seed at the nursery
hh. propagation of perennials
ii. contracting growing of nursery plants with other nurseries
jj. training younger workers when being a crew leader
kk. adjusting mower height for different lawn types
ll. switching mowing directions to accent mowing jobs
mm. use of hormones in plant propagation
nn. selection of plants for landscaping projects
oo. selection of landscaping materials for different jobs
   - colored rocks
   - tile
   - edging
   - large rocks
   - ornaments
pp. invoice preparation
qq. computerized drafting work for landscaping projects
rr. giving tours of the nursery
ss.
28. **AGRICULTURAL REPAIR AND MAINTENANCE-E/P**
   a. learn to operate all shop power equipment
   b. repair and maintain all equipment in the shop
   c. read blue prints
   d. be skilled at reading all measuring equipment
   e. be skilled in working with different metals and know their properties
   f. be safety certified on all shop equipment
   g. be skilled in welding
   h. know how to use all hand tools in the shop
   i. understand and maintain the shop’s inventory
   j. field test all equipment designed for farm use
   k. wear proper safety equipment
   l. maintain a record of all shop work completed by using a good record book
   m. knowledge of small and large engine components
   n. maintenance procedures
      - changing oil
      - checking transmission
      - checking tire air pressure
      - check radiators
      - all other fluids
   o. ability to cut metal
   p. ability to use a metal shear
   q. diagnose engine and machinery problems
   r. rotate tires

29. **AGRICULTURAL MECHANICS ENERGY SYSTEMS-E/P**
   a. learn about how to install a wire harness
   b. learn to read blue prints
   c. understand hydraulic principals
   d. ability to change hydraulic hoses
   e. ability to wire two and three way switches
   f. ability to install a fuse box
   g. ability to install an electrical panel
   h. ability to read amp meters and use electrical testers
   i. use safety in all areas of electrical work
   j. use safety in all areas of hydraulic work
   k. using all tools in electrical and hydraulic jobs
   l. install electrical switches and switch boxes
   m. know wire sizes for each job
   n. know the electrical load for wire types and sizes
   o. design a wiring set up for a building
   p. replace hydraulic hoses on tractors and equipment
   r. change ballasts in lighting systems
   s. maintain a record of all shop work completed by using a good record book

30. **AQUACULTURE-E/P**
   a. take pH readings on streams and in the aquaculture tanks in school labs
   b. take measurements for:
      - nitrate concentration
      - oxygen content
      - turbidity
      - water speed
   c. recognize fish and other aquaculture economic crops
   d. know the life cycle of aquatic animals
   e. know how mix and feed fish rations
   f. recognize aquatic plants and their contribution to the water ecosystem
   g. figure rates of gain for fish you grow
   h. figure feed efficiency for fish you grow
   i. be able to mark fish so you can record data on them as they grow
   j. use biofilters in aquaculture tanks
   k. set up and/or design an aquaculture system
   l. inventory all chemicals for maintaining fish tanks in the animal lab
   m. be able to process the fish you raise
   n. maintain records of all work related skills and times in this SAE
31. **FOREST MANAGEMENT AND PRODUCTS**
a. maintain and repair all equipment in the harvest and processing of lumber  
b. use all equipment properly  
c. be able to estimate the lumber in a stand of trees  
d. be able to figure board feet  
e. recognize different wood types and know their properties  
f. understand block cutting  
g. ability to plant and care for new trees for reforestation  
h. keep accurate records  
i. practice safety in all areas  
j. know how to “fall a tree”  
k. dispose of all branches and stumpage

32. **EMERGING AGRICULTURE TECHNOLOGY-E/P**
a. use of computer technology  
   - databases  
   - spreadsheets  
   - word documents  
   - publishing software  
   - others  
b. use of internet for SAE sales or advertising  
c. working in a laboratory situation  
   - soil testing  
   - milk testing  
   - biotechnology research  
d. following laboratory protocol  
e. use of microscopes  
f. soil testing process  
g. setting up laboratories for classes  
h. building laboratory systems  
   - for alcohol synthesis  
   - to separate chemicals  
   - others  
i. use of GPS in agriculture  
   - for fertilizer application  
   - yield responses at different field spots  
   - mapping fields  
j. live readings of backfat and loin eye areas from scanning market animals

33. **FOOD SCIENCE AND TECHNOLOGY-E/P**
a. following laboratory protocols  
b. developing new flavors for products  
c. experiments in food preservation techniques  
d. analyzing components/make-up of food products  
e. testing milk for  
   - solids  
   - fat  
   - protein  
   - water content  
f. comparing data on new varieties with older varieties  
g. determining digestibility  
h. research on growth additives on market animal growth  
i. comparison of antibiotics on laboratory animals with disease/health problems
34. **DIVERSIFIED LIVESTOCK PRODUCTION-E/P***

*combine the skills/efficiencies of two or more livestock areas such as beef, sheep, swine, buffalo, dairy, equine, poultry, or specialty animals

35. **DIVERSIFIED CROP PRODUCTION-E/P***

*combine the skills/efficiencies of two or more crops such as grain, fiber/oil crops, forages, specialty crops, fruits, and vegetables

36. **DIVERSIFIED AGRICULTURE PRODUCTION-E/P***

*combine the skills/efficiencies of at least one crop commodity and at least one livestock commodity