Student's Name _______________________________________________  AGRICULTURAL MACHINERY     AG 0227

Directions: Evaluate the trainee using the rating scale below and check the appropriate number to indicate the degree of competency achieved. The numerical ratings of 3, 2, 1, and 0 are not intended to represent the traditional school grading system of A, B, C, D, and F. The descriptions associated with each of the numbers focus on level of student performance for each of the tasks listed below.

Rating Scale:
0 - **No Exposure** - no information nor practice provided during training program, complete training required.
1 - **Exposure Only** - general information provided with no practice time, close supervision needed and additional training required.
2 - **Moderately Skilled** - has performed independently during training program, limited additional training may be required.
3 - **Skilled** - can perform independently with no additional training.

<table>
<thead>
<tr>
<th>01.0</th>
<th>Safety</th>
<th>02.0</th>
<th>Tillage Equipment</th>
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<td>■■■</td>
<td>01.01</td>
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<td></td>
<td>Identify safety equipment necessary for agricultural power technology</td>
<td>Apply basic laboratory safety instruction</td>
<td>Identify the characteristics and applications of the major types of tillage equipment</td>
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<td>01.03</td>
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<td>Describe safety practices when using electrical equipment</td>
<td>Read and interpret an operator's manual for a major type of tillage equipment</td>
<td>Calculate the potential field capacity of various sizes of tillage equipment</td>
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<td>■■■</td>
<td>01.04</td>
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<tr>
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<td>Apply safety practices when using tractors, machinery or hydraulics</td>
<td>Calculate the potential field capacity of various sizes of tillage equipment</td>
<td>Operate tillage equipment safely under field and transport conditions</td>
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<thead>
<tr>
<th>03.0</th>
<th>Seeding and Planting Equipment</th>
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<th>Seeding and Planting Equipment</th>
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<td>The student will be able to:</td>
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<td>Identify the major types of planting equipment</td>
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<td>Describe the major characteristics and applications of the different types of planting equipment</td>
<td>Describe the major characteristics and applications of the different types of planting equipment</td>
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<td>Read and interpret operator's manual for planting equipment</td>
<td>Read and interpret operator's manual for planting equipment</td>
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<td>Identify the major components of the different types of planting equipment</td>
<td>Identify the major components of the different types of planting equipment</td>
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<td>Operate planting equipment safely under field and transport situations</td>
<td>Operate planting equipment safely under field and transport situations</td>
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<td>03.06</td>
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<td>Adjust planter row spacing on planting equipment</td>
<td>Adjust planter row spacing on planting equipment</td>
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<td>03.07</td>
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<td>Adjust depth of seed placement on planting equipment</td>
<td>Adjust depth of seed placement on planting equipment</td>
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<td>03.08</td>
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<td></td>
<td>Service and maintain fertilizer and seed hoppers, agitators, seed tubes and fittings on planting equipment</td>
<td>Service and maintain fertilizer and seed hoppers, agitators, seed tubes and fittings on planting equipment</td>
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<td>Prepare planting equipment for storage</td>
<td>Prepare planting equipment for storage</td>
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<td>Identify the major types of seed metering mechanisms used on planters</td>
<td>Identify the major types of seed metering mechanisms used on planters</td>
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<td>Calibrate seed, fertilizer, herbicide and insecticide application rates under field conditions</td>
<td>Calibrate seed, fertilizer, herbicide and insecticide application rates under field conditions</td>
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<td>03.12</td>
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<td>Trouble-shoot planting equipment operation under field and shop conditions</td>
<td>Trouble-shoot planting equipment operation under field and shop conditions</td>
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04.0 Pest Control and Fertilizing Equipment
The student will be able to:

0 1 2 3
☐☐☐☐ 04.01 Describe the major functions of chemical application equipment
☐☐☐☐ 04.02 Identify the types of chemical application equipment
☐☐☐☐ 04.03 Describe the characteristics and applications of the major types of chemical application equipment
☐☐☐☐ 04.04 Describe the fundamentals of operation of the major types of sprayer pumps
☐☐☐☐ 05.05 Trouble-shoot sprayer pump operation
☐☐☐☐ 04.06 Describe the major characteristics and applications of the different types of sprayer nozzles
☐☐☐☐ 04.07 Read and interpret nozzle selection literature
☐☐☐☐ 04.08 Service and maintain sprayer nozzles and fittings
☐☐☐☐ 04.09 Describe the importance of accurate crop spraying equipment calibration
☐☐☐☐ 04.10 Select crop sprayer nozzles for desired application rate and spraying pressure
☐☐☐☐ 04.11 Calculate the required quantities of solution for spraying specific acres

05.0 Harvesting Equipment
The student will be able to:

0 1 2 3
☐☐☐☐ 05.01 Describe the alternative methods of harvesting crops.
☐☐☐☐ 05.02 Describe the characteristics and applications of the major types of harvesting equipment
☐☐☐☐ 05.03 Read and interpret an operators manual for harvesting equipment
☐☐☐☐ 05.04 Calculate the potential field capacity for various sizes of harvesting equipment
☐☐☐☐ 05.05 Identify the sources of harvest losses
☐☐☐☐ 05.06 Operate harvesting equipment safely under field and transport situations
☐☐☐☐ 05.07 Prepare harvesting equipment for storage
☐☐☐☐ 05.08 Describe adjustments and operating controls on the basic types of harvesting equipment
☐☐☐☐ 05.09 Trouble-shoot harvesting equipment operation under field and shop conditions

06.0 Agricultural Hydraulic Systems
The student will be able to:

0 1 2 3
☐☐☐☐ 06.01 Identify the applications of hydraulics in agriculture
☐☐☐☐ 06.02 Identify the components of a hydraulics system
☐☐☐☐ 06.03 Define terminology associated with hydraulic systems
☐☐☐☐ 06.04 Describe operating principles of hydraulic systems
☐☐☐☐ 06.05 List the advantages and disadvantages of utilizing hydraulics in agriculture
☐☐☐☐ 06.06 Read and interpret basic hydraulic schematic diagrams
☐☐☐☐ 06.07 Select the proper hydraulic fluid for a specific hydraulic system and operating condition
☐☐☐☐ 06.08 Drain, flush and refill hydraulic systems on agricultural equipment
☐☐☐☐ 06.09 Service and maintain hydraulic seals and packings
☐☐☐☐ 06.10 Select hydraulic tubing, pipe and remove hoses to fulfill specific pressure, volume and exposure requirements
☐☐☐☐ 06.11 Service, maintain and/or operate hydraulic fittings and couplers
☐☐☐☐ 06.12 Service and maintain hydraulic fluid filters
☐☐☐☐ 06.13 Trouble-shoot hydraulic motor operating problems
☐☐☐☐ 06.14 Select hydraulic motors to fit specific applications on agriculture equipment and power units
☐☐☐☐ 06.15 Determine relief valve pressure setting by the T-test method

07.0 Agricultural Machinery Management
The student will be able to:

0 1 2 3
☐☐☐☐ 07.01 Describe the relationship between machinery costs and other farm costs
☐☐☐☐ 07.02 Identify the basic management skills required to manage agricultural machinery
☐☐☐☐ 07.03 Describe the importance of good records in a farm machinery management program
☐☐☐☐ 07.04 List the types of records used in a farm machinery management program
☐☐☐☐ 07.05 Identify the sources of information that can be utilized to provide the farmer with assistance for his machinery management program
☐☐☐☐ 07.06 Calculate field capacity for various types of agricultural equipment and machinery
☐☐☐☐ 07.07 Calculate the material capacity for various types of agricultural equipment and machinery
07.08 Calculate throughput capacity for various types of agricultural equipment and machinery
07.09 Identify the variables that effect the theoretical capacity of agricultural machinery
07.10 Calculate theoretical capacity for various types of agricultural machinery
07.11 Define the term 'timeliness' as it relates to agricultural machinery
07.12 Describe how the time available for specific cropping operations effects decisions regarding machinery capacity requirements
07.13 Estimate economic and crop yield losses due to lost time or lack of timeliness in various cropping operations using a nomograph
07.14 Calculate the time available for specific cropping operations from past farm management records and university research data
07.15 List the factors that should be considered when matching agricultural machinery to a cropping system and/or power units
07.16 Compare the calculated ownership costs of various types of agricultural machinery and power units with differing capacities
07.17 List the factors that affect the field efficiency of agricultural machinery
07.18 Identify inefficient use of agricultural machinery and power units in a specific farming operation
07.19 Describe the ways that could be used to reduce the horsepower requirements for various types of agricultural machinery
07.20 Calculate horsepower requirements for various types of machinery based on needed capacity and available time
07.21 Describe the basic reasons why it is important to maintain a horsepower reserve when calculating horsepower requirements for agricultural machinery
07.22 List the factors to consider when selecting agricultural power units
07.23 Describe the methods used to rate agricultural power units and engines
07.24 Read an interpret university and manufacturer's literature, such as the Nebraska Tractor Tests, as it relates to the performance and specifications of agricultural power units and engines
07.25 Read and interpret data from a tractor dynamometer performance test
07.26 List the type of fixed costs that apply to agricultural machinery
07.27 Describe the term 'depreciation' as it relates to agricultural machinery
07.28 Describe the ways that can be used to prevent rapid depreciation of agricultural machinery
07.29 Identify the major methods used in a management program to depreciate agricultural machinery
07.30 Estimate the average annual fixed cost for various types and sizes of agricultural machinery
07.31 List the types of operating costs that apply to agricultural machinery
07.32 Calculate the total operating costs for various types of agricultural machinery and power units given the necessary data
07.33 List the alternatives to ownership of agricultural machinery
07.34 List the advantages and disadvantages of each of the alternatives to ownership
07.35 Calculate the break-even point in acres per year and tons per year of various types of agricultural machinery
07.36 Compare leasing and rental costs to ownership costs of various types of agricultural machinery
07.37 Estimate the average life expectancy of various types of agricultural machinery
07.38 Estimate the optimum time to trade-in various types of agricultural machinery
07.39 List the factors that effect the trade-in value of various types of agricultural machinery
07.40 Read and interpret prepared tables, such as tractor and implement bluebooks, to estimate trade-in and salvage value of agricultural machinery