West Virginia CTE

The Science of Agriculture

Plant Science

1 **Identify plants & plant diseases.** 0102.1

1 Identify plants including herbaceous plants, annual, biennial, and perennial types. 0102.1.1

2 Identify weed species. 0102.1.2

3 Demonstrate knowledge of the systematic classification of plants. 0102.1.3

4 Assess and identify symptoms of crop diseases. 0102.1.4

5 Explain the processes and benefits of crop rotation. 0102.1.5

2 **Describe entomology.** 0102.2

1 Identify insect pests. 0102.2.1

2 Explain the steps of metamorphosis. 0102.2.2

3 Define Integrated Pest Management. 0102.2.3

3 **Demonstrate understanding of soil preparation, propagation techniques, and regulating environmental conditions in plant production systems.** 0102.3

1 Prepare soil for planting, and plant or transplant seeds, bulbs, and cuttings. 0102.3.1

2 Plant seeds in specified areas and count the resulting plants to determine the percentage of seeds that germinated. 0102.3.2

3 Perform duties including propagating varieties of plant materials, collecting and germinating seeds, maintaining cuttings of plants, and controlling environmental conditions, and regulating irrigation systems. 0102.3.3

4 Prepare data summaries, reports, or analyses that include results, charts, or graphs to document research findings and results. 0102.3.4

5 Research the requirement of becoming a USDA Certified Organic crop producer. 0102.3.5

Soil Science

4 **Identify components of soil (e.g., soil texture, soil horizon).** 0102.4

1 Study soil characteristics to classify soils on the basis of factors such as geographic location, landscape position, or soil properties. 0102.4.1

5 **Demonstrate knowledge of soil nutrients (e.g., soil pH, calculate amounts of ertilizer, eutrophication).** 0102.5

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1 Analyze soil to determine types or quantities of fertilizer required for maximum crop production. 0102.5.1

2 Conduct studies of nitrogen or alternative fertilizer application methods, quantities, or timing to ensure satisfaction of crop needs and minimization of leaching, runoff, or denitrification. 0102.5.2

3 Explore components of urban and suburban market gardening. 0102.5.3

6 **Describe land capability use (e.g., land capability class, soil management practices).** 0102.6

1 Provide information or recommendations to farmers or other landowners regarding ways in which they can best use land, promote plant growth, or avoid or correct problems such as erosion. 0102.6.1

2 Investigate responses of soils to specific management practices to determine the use capabilities of soils and the effects of alternative practices on soil productivity. 0102.6.2

3 Investigate soil problems and poor water quality to determine sources and effects. 0102.6.3

4 Assess comparative soil erosion from various planting or tillage systems, such as conservation tillage with mulch or ridge till systems, no-till systems, or conventional tillage systems with or without moldboard plows. 0102.6.4

Animal Nutrition

7 **Determine nutritional needs of livestock (e.g., essential nutrients, protein, calculate feed, Pearson Square).** 0102.7

1 Study effects of feed on quality and quantity of animal products, such as eggs and milk. 0102.7.1

2 Study nutritional requirements of animals and nutritive values of animal feed materials. 0102.7.2

3 Select appropriate feedstuffs for animals based on factors such as economics, digestive system and nutritional needs. 0102.7.3

4 Formulate animal feeds based on nutritional requirements, using feed ingredients for maximum nutrition and optimal economic production. 0102.7.4

5 Appraise the adequacy of feed rations using data from the analysis of feedstuffs, animal requirements, and performance. 0102.7.5

6 Research the components of becoming a USDA Certified Organic livestock producer. 0102.7.6

8 **Differentiate forage production (e.g., carrying capacity).** 0102.8

1 Monitor pasture or grazing land use to ensure that livestock are properly fed or that conservation methods, such as rotational grazing, are used. 0102.8.1

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ycles of a small engine. 0102.9

Discuss the cycle of a 2-cycle engine. 0102.9.1

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2 Discuss the cycle of a 4-stroke engine. 0102.9.2

10 Identify parts. 0102.10

1 Identify the parts of small engine components 0102.10.1

2 Demonstrate knowledge of the usage of a small engine parts manual. 0102.10.2

11 Demonstrate knowledge of small engine maintenance (e.g., service manuals, fluid levels). 0102.11

1 Repair and maintain gasoline engines used to power equipment such as portable saws, rototillers, lawn mowers, generators, and compressors. 0102.11.1

2 Adjust points, valves, carburetors, distributors, and spark plug gaps, using feeler gauges. 0102.11.2

3 Reassemble engines after repair or maintenance work is complete and ensure that the reassembled engine is operational. 0102.11.3

4 Record repairs made, time spent, and parts used. 0102.11.4

5 Perform routine maintenance such as cleaning and oiling parts, honing cylinders, and tuning ignition systems. 0102.11.5

6 Obtain problem descriptions from customers and prepare cost estimates for repairs. 0102.11.6