Content Standard	Concepts	Benchmarks/Performance Indicators
Standard 1 – <u>NLP 1.0</u> Analyze NR systems and their interactions to balance production and sustainability	***Characteristics of organisms, plants and/or animals as commodities in NR production***	**<u>NLP 1.1</u> Examine characteristics of organisms as commodities to maximize NR production within the boundaries of sustainability.** • Analyze biological attributes of organisms (plants or animals) in order to support their growth as commodities in NR production. • Sort and categorize organisms using morphology (structures of plants or animals) to determine specific requirements for propagation. ✓ Use identification and common characteristics of organisms to determine classification, i.e. Family, subfamily ✓ Integrate classification and morphology of organisms to specify conditions for their support and maintenance • Assess an organism's capacity to react to stress (homeostasis) in order to create and maintain a conducive environment that supports NR production.
	Environments that support organisms for NR production	**<u>NLP 1.2</u> Assess features of environments to support NR commodity production and environmental sustainability.** • Analyze abiotic and biotic factors/components of environments to maintain and sustain selected organisms. Some examples are: ✓ Soil and other geological factors, i.e. land judging ✓ Topography and other geographic features ✓ Weather, climate, i.e. amount of sunlight daily, seasonally ✓ Water sources and water quality ✓ Insects, fungi, molds, viruses, bacteria, or other impacting organisms present in environment • Prioritize areas by their ability to support organisms in order to select locations for NR production. **<u>NLP 1.3</u> Employ understanding of NR systems interactions to a balanced approach of production and environmental sustainability.** • Analyze various methods of production to determine their effects on environments. Some examples are: ✓ Conventional Agriculture ✓ Organic Agriculture ✓ Cultural or Traditional Agriculture

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		✓ Urban Farming ✓ Sustainable or Environmental farming
Standard 2 – <u>NLP 2.0</u> **NR Production Management** Develop and implement management plans that support NR production.	***PRO-active*** ***Manage organisms and environments to support NR production of commodities***	**<u>NLP 2.1</u> Assimilate knowledge of characteristics of organisms, conditions for propagation, and environmental factors to develop management plans for NR production.** • Incorporate understanding of abiotic and biotic relationships in environments necessary for propagation and cultivation to develop management plans for production of NR commodities. • Differentiate between controllable/uncontrollable factors or influences on organisms and environments to include them in management plans. • Examine effectiveness of past, current, or emerging solutions and interventions in NR production to consider their integration into management plan.
	Produce, harvest, and process NR commodities for consumption	**<u>NLP 2.2</u> Implement management plans to produce, harvest and process NR products and commodities.** • Employ data and information such as economic behavior, consumer demand, market demand and supply for NR commodities to project and support production schedules and yields. • Facilitate harvesting and processing of commodities to meet regulations and requirements for marketable NR products. ✓ Employ harvesting, food handling and processing guidelines to protect health and safety of consumers, i.e. food safety and GAP (USDA "Good Agricultural Practices") principles ✓ Employ grading and certification standards to assess quality and condition of commodity, i.e. U.S. USDA grading standards, US Organic certification standards
Standard 3 – <u>NLP 3.0</u> **Investigation, Problem solving, Interventions and Innovation in NR Production** Implement solutions that enhance and/or sustain NR production.	***RE-active*** ***Problem-solving and critical thinking***	**<u>NLP 3.1</u> Develop solutions, interventions, or innovations using information and data to mitigate issues or problems in NR production.** • Assess implementation of management plans to determine variations or anomalies in the progress or growth of organisms • Implement the problem solving process to address an issue or solve a problem. Steps include: 1. Identify and define the problem using information and data

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		2. Generate criteria to determine and prioritize alternative solutions 3. Predict implications and consequences of alternative solutions, including legal and ethical ramifications, using data or information. 4. (Select a solution) 5. Create an action/management plan or implementation procedures for selected solution(s) 6. Evaluate results of implementing solution to determine effectiveness 7. Generate modifications or next steps to re-implement as needed
	Mathematical Applications	**<u>NLP 3.2</u> Incorporate appropriate quantitative reasoning and skills to inform decisions, solve problems, and evaluate solutions.** • Organize, analyze and present data to inform and support decisions. • Incorporate concepts of modeling when needed to develop solutions. • Select techniques, formulas and algorithms to describe conditions, examine alternative solutions, or assess impacts. ✓ Use the appropriate system of measurement, instrument and technique for task/project ✓ Convert various units of measurement to adapt to various applications ✓ Use statistical concepts such as central tendency, frequency, and variance to describe conditions or formulate conclusions and/or inferences
	Scientific Principles and concepts	**<u>NLP 3.3</u> Incorporate scientific principles or concepts to investigating, assessing, and solving NR production problem(s).** • Employ appropriate scientific aspects of inquiry as part of the problem solving process 1. Use observations and data to describe problems and/or assess solutions 2. Identify and isolate variables to investigate and/or test. 3. Use appropriate sampling techniques, protocols and instruments to collect data. 4. Incorporate new information to modify or adjust investigation as

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		new data or information arises 5. Acknowledge and credit sources, prior studies or data collected when used in investigations. • Employ relevant science concepts when needed to clarify investigations, mitigating processes and solutions. ✓ Use pertinent life science concepts and terminology to detail conditions and relationships between organisms and with the environments. ✓ Use physical and earth space science concepts and terminology to elaborate on changes to non-living factors that impact environments and organisms.
	Technological Tools	**NLP 3.4 Select and use appropriate tools, technology and equipment to investigate and/or solve NR production problems.** • Employ appropriate technology to gather information or data. • Employ technical resources, information, and data in management plans to detail mitigating actions or interventions and their impacts on production. • Distinguish tools, technology and equipment used in NR production by purpose and feasibility to determine appropriateness in application in various situations. • Select tools, technology or equipment for use in NR production management based on the suitability of their use and efficiency.
Standard 4 – NLP 4.0 Safety in NR Production Adhere to NR production regulatory guidelines to maintain safety and health in work environment.	***Safety, health, and environment***	**NLP 4.1 Apply appropriate regulatory guidelines to uphold NR production industry practices in safety and health.** • Follow pertinent regulations and practices in Materials Safety Data Sheets (MSDS), Hawaii Occupational Safety and Health Regulations (HIOSH), and the Occupational Safety and Health Administration (OSHA) in NR production activities. • Use materials, tools, technology and equipment in accordance with safety and health guidelines. • Comply with food, safety, and health guidelines in the processing of NR products and disposal of wastes to eliminate or minimize impacts and consequences to humans and the environment.

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		NLP 4.2 Assess conditions with considerations to safety and health in order to mitigate risks. • Perform site assessments to minimize risks in order to maintain a safe and healthy environment. • Employ proper body mechanics and injury prevention practices in NR work environments. • Dress appropriately to ensure personal safety, including removal of jewelry, personal accessories, and personal grooming.
Standard 5 – NLP 5.0 Legal and ethical considerations in NR production Employ various documents and resources to identify legal and ethical considerations applicable in NR production	***Policies, regulations, and ethics***	**NLP 5.1 Connect legal and ethical considerations applicable to NR production to support positive social and environmental welfare.** • Identify legal and ethical considerations from various documents pertinent to NR production. • Trace examples of changes in law, policies or regulations and their impact on NR production. **NLP 5.2 Analyze the legal and ethical responsibilities of individuals in NR production to support positive social and environmental welfare.** • Evaluate the individual's responsibility in complying with or implementing the expectations of laws or ethics in NR systems. • Critique how an individuals' legal and ethical behavior can influence NR production, society and the environment. **NLP 5.3 Use legal and ethical considerations to assess NR production practices or management plans for positive impacts on social and environmental welfare.** • Align legal and ethical considerations to related aspects of management plans.
Standard 6 – NLP 6.0 Communication in NR Production Interpret, exchange, and transfer information to support NR production.	***READ*** ***Interpret technical information***	**NLP 6.1 Interpret a variety of NR production work-related documents to acquire pertinent technical information and/or carry out tasks** • Decode work-related technical materials, charts, tables, and diagrams to transfer information. For example: ✓ Informational materials and resources from traditional and technological sources ✓ Instruction manuals and/or directions ✓ Nutrient, fertilizer NPK analyses

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	WRITE ***Express and communicate technical information***	✓ Carrying capacity matrices, charts and tables ✓ Contour and/or topography maps, soil survey maps • Interpret and summarize research articles, trade journals, industry periodicals and publications to communicate relevant information. • Incorporate information from various resources, such as technical documents, tools and equipment specifications, and policy/procedural manuals, that are applicable to tasks. **<u>NLP 6.2</u> Use technical terms and symbols, resources, and information in written communication to effectively communicate ideas in a clear and industry appropriate style to different audiences.** • Generate communications, reports and documents using correct NR production terminology, form, and information from a range of sources. • Organize information, instructions, guidelines or procedures from a range of sources to communicate implementation of tasks or replication of process and results.
	ORAL ***Express and communicate technical information***	**<u>NLP 6.3</u> Communicate orally to convey and/or receive NR technical information and ideas.** • Orally communicate technical information and ideas in a clear, logical and work appropriate manner. ✓ Use correct work-related vernacular, language and terminology ✓ Communicate NR production technical terms to support and enhance audience understanding • Employ behaviors that contribute to meaningful and respectful communication between people. (i.e. giving speaker full attention, organize important points speaker is conveying, ask appropriate clarifying questions, refrain from inappropriate interruptions, etc.) ✓ Model specific supportive non-verbal behaviors to convey the appropriate message ✓ Employ listening skills to gather information and enhance understanding ✓ Consider the important points a speaker is trying to convey and make connections to current knowledge ✓ Use appropriate supportive non-verbal communication

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		techniques to enhance communication
Standard 7 – <u>NLP 7.0</u> **Careers in Natural Resources Production** Evaluate personal interests, strengths and compatibility with various careers in NR production.	***Knowledge, skills, behavior, attitudes, and abilities*** ***Compatibility*** ***Education and training***	**<u>NLP 7.1</u> Evaluate personal attributes to determine the level of compatibility with NR production careers or occupations.** • Examine a variety of possible occupations related to NR production and processing to identify required skills and knowledge. • Match personal characteristics, strengths and interests career opportunities in NR production. • Determine education and training necessary to achieve career targets.