

# 4R Nutrient Stewardship Certification Standard

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*Requirements for Certification  
of Nutrient Service Providers in the Lake Erie Watershed and  
all of Ohio*

*Version 2.5  
February 2017*



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## Introduction

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### A Background

The 4R Certification Standard was originally created under the auspices of the 4R Advisory Committee, members of which are based in the tri-state region of Indiana, Michigan, and Ohio. The 4R Advisory Committee members represent a diversity of stakeholders from the business, government, university, and non-governmental sectors with the common goal of maintaining agricultural productivity while also improving the water quality of Lake Erie and its contributing watersheds. Since then the program has expanded to other watersheds.

The 4Rs of nutrient stewardship refer to using the Right Source of nutrients at the Right Rate and Right Time in the Right Place (TFI, 2013). 4R Nutrient Stewardship provides a science-based framework for plant nutrition management while also considering site-specific needs of a particular farm (IPNI, 2012).

In creating a 4R Certification Program, the 4R Advisory Committee has sought to provide guidance and direction for a consistent, recognized program for agricultural retailers, agricultural service providers, and certified professionals to help ensure that 4R nutrient management goals are adopted and that in turn lead to long term positive impacts on water quality. While this Standard does not apply to individual growers, on-farm adoption of the recommendations made by Nutrient Service Providers that become certified under this standard is critical to meeting the goal of improved water quality.

In addition to general principles of 4R Nutrient Stewardship (IPNI, 2012), the Standard has incorporated specific criteria for the purpose of addressing regional priorities for water quality and its tributaries, including references to regional soil fertility recommendations (e.g., Vitosh et al., 2012) and requirements to prevent nutrient application on frozen ground. The Standard also follows guidelines put forth in the Conservation Practice Standard for Nutrient Management (NRCS, 2012) where appropriate.

This Standard is intended to support the adoption of 4R Nutrient Stewardship by specifying best practices for nutrient recommendations and nutrient application. The Standard also includes an education component to ensure that new practices related to nutrient stewardship are adopted by the Nutrient Service Providers and shared with their grower customers.

The 4R Advisory Committee members will continue to engage the research community to help identify the most effective conservation and nutrient management practices, and anticipate that revisions to the Standard may be necessary on a regular basis to take advantage of the most current research available.

### B Scope

The 4R Nutrient Stewardship Program, of which this Standard is a central component, is designed to recognize Nutrient Service Providers who have adopted the principles and practices of 4R Nutrient Stewardship (IPNI, 2012). This Standard translates 4R Nutrient Stewardship into a set of auditable criteria.

The 4R Nutrient Stewardship Program is voluntary, and applies to Nutrient Service Providers working in the Lake Erie and Ohio River watersheds, including agricultural retailers, agricultural service providers, and certified professionals. Grower customers of the Nutrient Service Providers are **not** included under the scope of the Standard.

Further information about the scope and certification procedure are provided in the companion documents to the Standard, which include the *Auditor Manual for 4R Nutrient Stewardship Certification, Version 1.3* (for auditors) and the *4R Nutrient Stewardship Certification Manual, Version 2.1* (for Nutrient Service Providers who wish to be certified under the program).

## **C Goals**

The 4R Nutrient Stewardship Certification Standard was drafted as part of an initiative to improve the watershed conditions of the Western Lake Erie Basin, lying within portions of Indiana, Michigan, and Ohio, with the long-term goal of developing and implementing 4R certification in other agricultural areas of the United States. The Standard was created to address the following goals:

- maximize crop uptake of nutrients and minimize nutrient losses
- create long-term positive impacts on water bodies associated with agricultural production areas, including the reduction of eutrophication and incidence of harmful algal blooms, and helping to meet water quality standards
- encourage sharing of the most up-to-date information about responsible nutrient stewardship with Nutrient Service Providers and growers
- help the agricultural sector adapt to new research and technology in the area of nutrient stewardship

## **D Structure and Implementation**

The Standard is divided into three main Sections:

1. Initial Training and Ongoing Education
2. Monitoring of 4R Implementation
3. Nutrient Recommendations and Application

Sections 1 and 2 apply to all types of Nutrient Service Providers pursuing certification in the program. Parts of Section 3 may not be applicable for those Nutrient Service Providers that either only make recommendations for nutrient use *or* only carry out nutrient application.

Within each Section, requirements are subdivided into groups based on related subject matter. Each group consists of auditable evaluation criteria, which form the basis of the Standard. There are a total of 44 auditable evaluation criteria. Of that total: 7 address Initial Training and Ongoing Education, 4 address Monitoring of 4R Implementation, 33 address Nutrient Recommendations and Application.

In most cases, a Nutrient Service Provider will offer nutrient recommendations or nutrient application services or both to multiple farms. Unless otherwise specified, 100% of grower customers of the Nutrient Service Provider must meet the requirements specified by the auditable evaluation criteria during every audit year in order to achieve conformance with the Standard. Other auditable evaluation criteria have specific percent acreage requirements which indicate the percent of total farms acres treated by the Nutrient Service Provider, or are designated as Year 2 or Year 3 requirements. Year 2 or Year 3 auditable evaluation criteria become mandatory on the year specified and for all subsequent years thereafter. Currently there are ten (10) auditable evaluation criteria listed as Year 2 requirements, and six (6) auditable evaluation criteria listed as Year 3 requirements.

Using the Standard as the normative reference, audits will be conducted by third-party auditors to determine whether a specified agricultural retailer, agricultural service provider, or crop adviser, acting as a Nutrient Service Provider, has met the requirements of the Standard. The degree of conformance to the Standard will be assessed by the auditor, who will evaluate each auditable evaluation criterion, as: Comply, Not Comply, or Not Applicable.

The certification program will be on a three year audit cycle. For a Nutrient Service Provider new to the program, an onsite audit of the Nutrient Service Provider will be conducted on the first and second years of the audit cycle. If the Nutrient Service Provider performs well during the second year of the audit cycle, it may be possible to submit a progress report in lieu of an onsite audit at the time of the third year of the audit cycle. For subsequent audit years, an onsite audit will be required for the first year and depending on the performance of the Nutrient Service Provider, a progress report may be submitted in lieu of an onsite audit for the second and third years of the audit cycle.

Further information about the audit and certification process is presented in the *Auditor Manual for 4R Nutrient Stewardship Certification, Version 1.3* (for auditors) and the *4R Nutrient Stewardship Certification Manual, Version 2.1* (for Nutrient Service Providers who wish to be certified under the program).

## **E      Contact**

Questions about the 4R Nutrient Stewardship Certification Program or this document should be directed to the Program Administrator, Ohio Agri-Business Association, 614.326.7520 ext. 4, aallman@oaba.net or go online to [www.4Rcertified.org](http://www.4Rcertified.org).

## Terms and Definitions

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**4R:** An approach for best nutrient management practices developed globally by the fertilizer industry (IPNI, 2012). “4R” refers to the “Right source, applied at the Right rate, at the Right time in the Right place.” The philosophy of the 4R approach is to base nutrient recommendations and application on scientific principles, including site-specific considerations and adaptive management, with the goal of improved sustainability.

**Adaptive Management:** An ongoing process of developing improved practices for efficient production and resource conservation by use of participatory learning through continuous, systematic assessment. For the purposes of the Standard, the demonstration of adaptive management includes documented on-farm data showing reasonable expectation of improved crop yield without increased risk of harm to water quality.

**Agricultural Retailer:** An entity that sells agricultural services or inputs.

**Agricultural Service Provider:** An entity that provides agronomic services related to agricultural production.

**Audit Report:** The report that is prepared by a third-party auditor in years during which there is an onsite audit (*see also* “Progress Report”).

**Auditable Evaluation Criteria:** Normative statements that are used by auditors to evaluate compliance to a standard.

**Certification:** The process by which an accredited or authorized person or organization (often a third party) will follow established procedures to assess the conformity against an applicable performance standard. When adequate conformity to the standard has been verified, the accredited or authorized person or organization will attest in writing that a product, process or service conforms to specified requirements.

**Certification Body:** An independent, third-party organization that will follow established procedures for assessing conformity against an applicable standard to determine certification status of a product, process, or service (*see also* “Certification”).

**Certified Professional:** An individual that has the designation of at least one of the following: Certified Crop Adviser (CCA), USDA-NRCS Comprehensive Nutrient Management Plan (CNMP) Specialist, Certified Professional Agronomist (CPAg), or other relevant accreditation from the American Society of Agronomy or National Alliance of Independent Crop Consultants.

**Cover Crop:** A crop grown for the protection and enrichment of the soil, which is usually established between periods of regular crop production (e.g., grasses, legumes, clover).

**Continuing Education Unit (CEU):** One (1) CEU is defined as one (1) hour of quality contact time in training or other qualifying activity addressing the continuing education criterion. For the purposes of the Standard, a qualifying CEU must have been approved by a Certified Crop Adviser (CCA) state board.

**Crop Adviser:** An individual who provides advice to grower customers about crop management and inputs.

**Desk Audit:** Assessing conformance to a standard through off-site review of documents and records. A desk audit is usually conducted at the location of the auditor, as opposed to the location of the auditee (*see also* “Field Audit,” “Office Audit”).

**Eutrophication:** The enrichment of water bodies with nutrients that stimulates proliferation of aquatic plant life.

**Field Audit:** The process of assessing conformance to a standard through an onsite visit to place of agricultural production of the auditee (*see also* “Field Audit,” “Office Audit”).

**Frozen Ground:** For the purposes of this Standard, frozen ground is when soil conditions are such that tillage or nutrient incorporation and/or injection after application are not possible at the time of nutrient application, and will not be possible within the next 48 hours as a result of frozen conditions.

**Grower Customer:** Individual growers or farmers who are clients of the Nutrient Service Provider and receive either a nutrient recommendation from the Nutrient Service Provider, or have nutrients applied by the Nutrient Service Provider.

**Maintenance Limit:** The upper limit of the maintenance range, a range of soil test levels within which the recommended rate aims to replenish crop removal. Soil test levels above the maintenance limit receive progressively lower rate recommendations, usually declining to zero at a level 10 to 20 ppm above the maintenance limit (*for example, see* Vitosh et al., 2012).

**Nutrient Management Plan:** A plan detailing a set of practices designed to maximize nutrient use efficiency and minimize nutrient losses. The criteria for nutrient management plans vary according to state (*see* NRCS, 2013)

**Nutrient Stewardship:** Planning and implementation of practices designed to manage crop nutrition for improved efficiency of crop production systems and optimization of nutrient use (*see* “4R”).

**Nutrient Service Provider:** General term that refers to entities covered under the scope of the 4R Nutrient Stewardship Standard, including agricultural retailers, agricultural service providers, and certified professionals. For the purposes of the Standard, the relevant functions of Nutrient Service Providers are to provide nutrient recommendations and/or apply nutrients for grower customers.

**Office Audit:** Assessing conformance to a standard through review of documents and records without direct field observations. An office audit is typically conducted at the site of the program participant and entails both document review and interview (*see also* “Field Audit,” “Office Audit”).

**Progress Report:** The report that is required from the Nutrient Service Provider in years during which there is no onsite audit (*also see* “Audit Report”). A progress report will be evaluated through a desk audit.

**Setback:** The spatial zone established between the edge of a crop to an identifiable feature such as a water body for the purpose of protecting the feature from adverse impacts.

**Snow-covered:** For the purposes of this Standard, snow-covered ground is when soil cannot be seen because of snow cover.

**Standard:** In general, the normative reference by which a decision to award certification is made. For the purposes of this document, when capitalized, “Standard” refers to the specific guidelines and references established in the 4R Nutrient Stewardship Program.

**Variable Rate Application (VRA):** Application of nutrient according to site-specific rate requirements, as opposed to uniformly throughout a field.



## References

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### Certification Program References

*4R Nutrient Stewardship Certification Manual, Version 2.1*

*Auditor Manual for 4R Nutrient Stewardship Certification, Version 1.3*

### Primary External References

International Plant Nutrition Institute (IPNI). *4R Plant Nutrition: A Manual for Improving the Management of Plant Nutrition*. North American Version. Norcross, GA, 2012.

International Plant Nutrition Institute (IPNI). *4R Nutrient Stewardship Portal*. <http://www.ipni.net/4R> Accessed February 2013.

National Oceanic and Atmospheric Administration (NOAA). *National Weather Service*. <http://www.weather.gov/>. Accessed April 2013.

Natural Resources Conservation Service (NRCS). *Conservation Practice Standard. Nutrient Management (Ac.) Code 590*. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1046433.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046433.pdf) January 2012.

Natural Resources Conservation Service (NRCS). *Field Office Technical Guide Locator* [http://efotg.sc.egov.usda.gov/efotg\\_locator.aspx](http://efotg.sc.egov.usda.gov/efotg_locator.aspx) Accessed April 2013.

Vitosh, ML, Johnson, JW, Mengel, DB, eds. *Tri-State Fertilizer Recommendations for Corn, Soybeans, Wheat and Alfalfa. Bulletin E-2567*. <http://ohioline.osu.edu/e2567/index.html> Accessed February 2013.

The Fertilizer Institute (TFI). *Nutrient Stewardship | The Right Time for Nutrient Stewardship Is Right Now*. <http://www.nutrientstewardship.com> Accessed February 2013.

## Standard Requirements - 1: Initial Training and Ongoing Education

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*Unless otherwise specified, 100% (if applicable) of grower customers of the Nutrient Service Provider must meet the requirements specified by the auditable evaluation criteria during every audit year in order to achieve conformance with the Standard.*

### 1 Initial Training and Ongoing Education

**Overview:** Nutrient Service Providers and their grower customers must be educated and trained on the principles of 4R Nutrient Stewardship. An ancillary goal of the requirement for education and training on 4R Nutrient Stewardship is to support the adoption of new research and technologies for nutrient management.

#### 1.1 Initial Training of Nutrient Service Providers, Sales, and Application Staff

1.1.1 Nutrient Service Providers, sales, and application staff have undergone an initial training and staff are able to demonstrate knowledge about 4R Nutrient Stewardship and the 4R Certification Program.

#### 1.2 Ongoing Education and Training of Nutrient Service Providers, Sales, and Application Staff

1.2.1 Certified professionals must have current certification in good standing.

1.2.2 Nutrient Service Providers (i.e., nutrient recommendation) staff attend a training, at least once every 2 years on the practices and principles of 4R Nutrient Stewardship, soil sampling and testing techniques, and/or nutrient water interaction. This is demonstrated through a minimum of 5 approved CEUs of relevant training. **(YEAR 2 REQUIREMENT)**

1.2.3 Nutrient Service Providers sales, and application staff attend a training at least once every 2 years on 4R Nutrient Stewardship. This is demonstrated through a minimum of 2 hours of relevant training approved by the program administrator. **(YEAR 2 REQUIREMENT)**

1.2.4 At least one Nutrient Service Provider staff member and/or contract position, has been trained in writing nutrient management plans. **(YEAR 2 REQUIREMENT)**

#### 1.3 Education and Training of Grower Customers

1.3.1 Nutrient Service Provider has conveyed informational materials on 4R Nutrient Stewardship to all grower customers. **(YEAR 2 REQUIREMENT)**

1.3.2 Nutrient Service Provider has sponsored or directly provided a training session on 4R Nutrient Stewardship that is available for all grower customers. **(YEAR 2 REQUIREMENT)**

## Standard Requirements - 2: Monitoring of 4R Implementation

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*Unless otherwise specified, 100% of grower customers of the Nutrient Service Provider must meet the requirements specified by the auditable evaluation criteria during every audit year in order to achieve conformance with the Standard.*

### 2 Monitoring of 4R Implementation

**Overview:** The implementation of 4R principles and practices are recorded and monitored, including annual summary totals of fertilizer products applied. Records of implementation are checked by the Nutrient Service Provider to evaluate progress of the implementation of 4R principle and practices over time.

#### 2.1 Monitoring of 4R Implementation

2.1.1 Nutrient Service Providers will record a list of grower customers and number of acres in the following categories: full service, recommendation only, application only, and an estimate of all other acres.

2.1.2 Field records related to monitoring of 4R implementation must include the watershed or watersheds where the farms are located. **(YEAR 3 REQUIREMENT)**

2.1.3 Nutrient Service Provider maintains a grower customers signature that confirms their support of 4R Nutrient Stewardship. *The grower signatures must represent at least 70% of the acres, as outlined in the grower customer list.* **(YEAR 3 REQUIREMENT)**

## Standard Requirements - 3: Nutrient Recommendations & Application

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*Unless otherwise specified, 100% of grower customers of the Nutrient Service Provider must meet the requirements specified by the auditable evaluation criteria during every audit year in order to achieve conformance with the Standard.*

### 3 Nutrient Recommendations and Application

**Overview:** Nutrient recommendations and application are made with the goal of maximizing crop uptake and minimizing nutrient losses to the environment. Records are maintained on grower customers' nutrient recommendations and nutrient application. Soil testing plays an important role in the development of well-founded nutrient recommendations and such testing must be based on appropriate sampling frequency and intensity. Goals for crop yields must be calculated and included in the recommendation. Nutrient recommendations and application conducted by the nutrient service provider must be consistent with the Tri-State Fertilizer Recommendations (Vitosh et al., 2012) or other recommendations recognized and supported by a land-grant university, allowing for adaptive management based on documented on-farm data showing reasonable expectation of improved crop yield without increased risk of harm to water quality. Nutrient recommendations and application conducted by the nutrient service provider must observe setbacks to water bodies and other features. Nitrogen and phosphorus must not be applied or recommended for application on frozen ground or prior to rainfall. All sources of nutrients must be accounted for in the recommendation, and the recommendation must be reviewed by a certified professional. Variable Rate Application is used when justified. Nutrients are not applied at more than a 2-year application rate.

### 3.1 Records for Recommendations and/or Application

3.1.1 Nutrient Service Provider maintains records related to all growers' nutrient recommendations/applications.

3.1.2 Records related to grower customers are kept confidential by the Nutrient Service Provider and are made available for review during an audit.

3.1.3 Nutrient Service Provider keeps onsite list and/or copies (either electronic or hard-copy) of relevant national, state, or local laws related to nutrient recommendations and application.

3.1.4 Records are reviewed with and available for grower/customer include the following, as applicable:

- soil test results,
- field boundary,
- nutrient recommendations, and
- rates applied to each field.

3.1.5 Records of individual fields include, at minimum:

- field boundary,
- current soil test results, and
- crop yield goals used for making recommendations.

3.1.6 Records of nutrient application include at minimum:

- method of application;
- time of application;
- a field map showing locations of application;
- weather (temperature and precipitation) conditions at the time of application; and
- weather forecast for the following 12 hours after application. *For the purposes of the Standard, the weather forecast should be obtained from NOAA.*

**(YEAR 2 REQUIREMENT)**

3.1.7 Application records shall not exceed recommendations for custom applied acres.

### 3.2 Maps for Recommendations and/or Application

3.2.1 Field maps must include information about yield goals, sensitive areas (e.g., surface water, inlets, wells, etc.), soil type delineation, setbacks, and soil test results. **(YEAR 2 REQUIREMENT)**

3.2.2 Field map boundaries are in a digital form such as Geographic Information Systems (GIS) shape files. **(YEAR 2 REQUIREMENT)**

3.2.3 Data layers (e.g., sensitive areas, yield data or goals, soil test data, soil type) of digital field maps are combined in an analysis to better target nutrients in the fields. *At least 35% of*

*the total farm acres treated by Nutrient Service Provider must meet Criterion 3.2.3. (YEAR 3 REQUIREMENT)*

### **3.3 Soil Tests for Recommendations and/or Application**

3.3.1 Soil tests are conducted which include, at minimum: organic matter, Phosphorus, Potassium, pH, and cation exchange capacity.

3.3.2 Soil tests are conducted at least once every 4 years.

3.3.3 Soil tests are taken from relatively uniform areas no larger than 25 acres. (YEAR 2 REQUIREMENT)

3.3.4 Geo-referenced soil test results are included on a farm map using Geographic Information System (GIS) software. *At least 35% of the total farm acres treated by Nutrient Service Provider must meet Criterion 3.3.4. (YEAR 3 REQUIREMENT)*

### **3.4 Crop Yield Determination and Monitoring**

3.4.1 Crop yield goals are discussed with the grower and are based on previous crop yield history, and soil potential.

### **3.5 Nutrient Recommendations and/or Application made by the NSP (General)**

3.5.1 Nutrient recommendations are based on the soil test history of the field, including results from the most recent soil test.

3.5.2 Recommended nutrient application levels are at or below limits specified by nutrient application recommendations recognized by a land-grant university, allowing for adaptive management based on documented on-farm data showing reasonable expectation of improved crop yield without increased risk of harm to water quality.

3.5.3 All sources of nutrients are accounted for in the nutrient management recommendation, including but not limited to commercial fertilizers, manure/litter, biosolids, cover crops, and the previous crop.

3.5.4 If manure is applied, manure analyses must follow land-grant university guidance regarding required analyses and/or include, at minimum: total nitrogen (N), ammonium N, total phosphorus (P) or P<sub>2</sub>O<sub>5</sub>, total potassium (K) or K<sub>2</sub>O, and percent solids. The manure analyses of applied material report is dated less than 24 months before the manure application.

3.5.5 Phosphorus injection, subsurface banding, or broadcasting with immediate incorporation is recommended as preferred placement methods unless conditions exist in requirement 3.5.6.

### **3.5 Nutrient Recommendations and/or Application made by the NSP (General) *continued***

3.5.6 Broadcast phosphorus applications without incorporation within one week are not recommended unless:

- a) the field has been in continuous no-till for at least three years, or
- b) has a cover crop or growing crop , or
- c) the risk for phosphorus loss to surface waters has been demonstrated to be low, according to a NRCS-approved phosphorus index risk assessment procedure.

3.5.7 Broadcast applications of phosphate without immediate incorporation are neither made nor recommended unless the NOAA forecast indicates less than a 50% chance of a rainfall event involving more than an inch of rain beginning in the next 12 hours. **(YEAR 3 REQUIREMENT)**

3.5.8 Phosphorus and nitrogen applications are neither made nor recommended to be made on frozen or snow covered ground.

3.5.9 Phosphorus is neither applied nor recommended to be applied at rates that exceed the Tri-State Fertilizer Recommendations for corn, soybeans, alfalfa and wheat and land-grant university for specialty crops and the total application does not to exceed the quantity needed for the next two years of planned crops.

3.5.10 Nutrients are applied according to a written nutrient recommendation that has been prepared within the prior 2 years.

3.5.11 No fall application of nitrogen fertilizer above 50 pounds\* for spring planted crops.

*\*Rate is based on typical rates as applied with fall application of typical phosphate sources; research will be reviewed and conducted to determine if this amount needs to be revised.*

3.5.12 If urea is broadcast and not incorporated within 24 hours, it is recommended to be applied with a urease inhibitor.

3.5.13 Discussion on nitrogen management include options of split application, nitrification inhibitors, and slow release technologies. **(YEAR 2 REQUIREMENT)**

### **3.6 Setbacks for Recommendations and/or Application**

3.6.1 Nutrient recommendations and/or application adhere to minimum setbacks from all sensitive areas, such as tile inlets, well heads, gullies, and water bodies specified in applicable national, state, or local laws.

3.6.2 For all nutrient recommendations and/or application, the inclusion of a minimum setback distance (e.g., 35-100 ft.) near sensitive areas, such as tile inlets, well heads, gullies, and water bodies is documented and discussed with the grower customer.

### **3.7 Review of Recommendations**

3.7.1 Nutrient recommendations have been reviewed and acknowledged in writing by the grower/customer.

3.7.2 Nutrient recommendations for each grower have been approved and signed by a Certified Professional.

### **3.8 Application Equipment and Technology**

3.8.1 All nutrient application equipment must be calibrated, at least annually.

3.8.2 Variable Rate Technology is used to apply nutrients. *At least 35% of the total farm acres treated by Nutrient Service Provider must meet Criterion 3.8.2. (YEAR 3 REQUIREMENT)*