South Carolina

Annual Fertilizer Report

2023-2024

FERTILIZER REGULATORY & CERTIFICATION SERVICES

Our mission is to serve the citizens of South Carolina and to protect property and the environment through regulation, service, and enforcement by utilizing a combination of analysis, diagnostics, education, and inspection.

Clemson University Administration

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Matt Holt	Dean, CAFLS
Steve Cole	Director of RPSP
Mike Weyman	Deputy Director of RPSP

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	Wesley Ulmer
	Jimmy Lee Shaw
SCFAA:	William Henderson
	Tyler Segars
	Todd Childers
Clemson Extension:	Jay Crouch
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Clemson Research:	Sarah White
	Bhupinder Farmaha
SCDHEC:	Tim Eleazer
SCDA:	Sam Quinney
At Large:	Chris Rawl
NRCS:	Gordan Mikell
	Russel Duncan (chair)
	David Cantley
Ex Officio:	Brad Stancil
	Amy Ashley
	Steve Cole

Program Administration & Staff

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Lauren Bramlett	Program Coordinator
Scott Bell	Inspector
Michael Bishop	Inspector
Tre' Coleman	Inspector
Andy Duncan	Inspector
Ezra Munn	Inspector
Mark Farish	Inspector
Amy Ashley	Chemist/ Lab Manager
Chris Wall	Chemist
Shannon Porter	Program Assistant
Shannon Alford	Lab Director
Jennifer Cooley	Administrative Assistant

INSPECTION AND ANALYSIS OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIMING MATERIALS

Included in the responsibilities of the Fertilizer Regulatory and Certification Services is the enforcement of the South Carolina Fertilizer Law, the South Carolina Soil Amendment Regulation and the South Carolina Agricultural Liming Materials Act.

This publication published annually includes information pertaining to each of the listed laws and regulations and statistical data pertaining to official fertilizer and lime samples taken and analyzed by the Department of Fertilizer Regulatory and Certification Services.

Statistical data relating to fertilizer and lime tonnage is compiled by Brad Stancil and included in the publication each year.

THE SOUTH CAROLINA FERTILIZER LAW

The present South Carolina Fertilizer Law was enacted in 1954, amended in 1970, 1978, 1988, 2002, 2008 and 2014. The last revisions included: (1) Establishment of a registration fee for bulk fertilizer based on amount of tonnage sold in South Carolina rather than individual product registrations (2) Provisions for deficiency penalties to be distributed through the department (3) Civil penalty authority (4) Provision to assess liability to a distributor (5) Establishment of restricted and general fertilizer permitting system to increase security of certain fertilizer materials.

THE SOUTH CAROLINA AGRICULTURE LIMING MATERIALS AND LANDPLASTER ACT

The South Carolina Agricultural Liming Material and Landplaster Act was enacted on June 14, 2011. The major provisions of the law are: (1) all liming and landplaster materials offered for sale for agricultural use must be registered; (2) all liming materials must be labeled as to guarantees in percent (a) calcium carbonate equivalent (neutralizing value), (b) calcium (Ca) and magnesium (Mg) in the elemental expression, and (c) particle size distribution: (3) all landplaster material must be labeled as to guarantee minimum percentages of calcium and sulfur: (4) labels must indicate registrant, weight and type of material and (5) tonnage reports filed quarterly by types of material by county.

REGISTRATION

A registrant may sell as many grades and brands of fertilizer with the payment of one license fee based on the amount of tonnage sold in accordance with the following schedule:

FEE CATEGORY	AMOUNT
Category 1 Fertilizer Registration (0-5,000 tons)	$100
Category 2 Fertilizer Registration (5,000-25,000 tons)	$200
Category 3 Fertilizer Registration (25,000 tons or greater)	$400
Restricted Fertilizer Permit	$250
Specialty Fertilizers (10 lbs. or less)	$60/ product
Fertilizer Inspection Fees (excluding specialty fertilizers)	$1.50/ ton
Soil Amendment Registration	$100/ product
Soil Amendment Tonnage	$1/ ton
Lime and Landplaster Registration	$20/ product
Lime and Landplaster Permit	$20
Lime and Landplaster Tonnage	$0.50/ton

Fertilizer sold in quantities of greater than 10 pounds are subject to an inspection fee of $1.50 per ton due quarterly for periods ending September 30th, December 31st, March 31st, and June 30th. The inspection fee is due within thirty days following the end of each quarter covering tonnage of commercial fertilizer sold during the preceding quarter by the registrant or guarantor transacting, distributing, or selling to a non registrant. For individual packages of commercial fertilizer containing 10 pounds or less a combined registration fee and inspection fee of $60.00 per product is required.

Registrants must furnish a list of sources of ingredients for all grades and brands sold upon registration and must ensure that it be kept current to reflect any changes in sources should they occur during the year of registration.

Before being sold or offered for sale, each brand of "Soil Amendment" must be registered with the Department of Fertilizer Regulatory and Certification Services. Registration is $100.00 per product and expires on June 30. Claims and research data must accompany registration request forms.

Before being sold or offered for sale, each brand of agricultural liming material and/or landplaster must be registered with the Department of Fertilizer Regulatory and Certification Services on provided forms. Registration is $20.00 per product and expires on June 30. All Liming Materials and Landplaster are subject to an inspection fee of $0.50 per ton due quarterly for periods ending September 30th, December 31st, March 31st, and June 30th. The inspection fee is due within thirty days following the end of each quarter.

LABELING

All fertilizers, soil amendments and agricultural liming materials offered for sale, sold or otherwise supplied in South Carolina, are required to be labeled in such a manner that the entire label is easily readable and in compliance with the form as set forth under Section 46-25-410 of the South Carolina Fertilizer Law and Section 46-25-40 of the South Carolina Agricultural Liming Materials Act. Where sold in bags or other containers, the required information may be placed on the container itself or on a tag attached to the container. For fertilizer in bulk, non-containers, the same information is required as to brand name and guaranteed analysis. This must appear on the invoice or delivery ticket and be supplied the purchaser. If secondary or micro-nutrients are mentioned or claimed in any manner whatsoever a guarantee must appear on the container or invoice and be guaranteed in the elemental form.

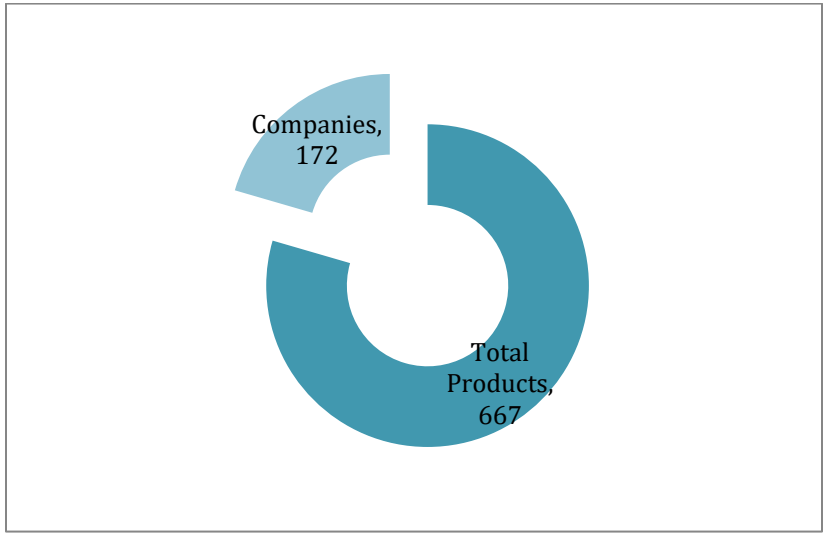
Guarantees are shown in percent of individual nutrients by weight compared to the total weight. Net weights must be shown on the label or on the invoice. Volume alone for fluid fertilizers is not permissible. The guarantee and the weight must appear on the label so that a consumer can multiply the guarantee by the weight and determine how many pounds of actual plant nutrients are being purchased.

Every purchaser is encouraged to read and understand thoroughly the label and know the claims made for the product he is purchasing.

The Fertilizer-Seed Inspectors of the Department of Fertilizer Regulatory and Certification Services inspect for proper bag printing, labeling and weight to ensure that label requirements are met.

SOIL AMENDMENTS

Soil amendments are products advertised to increase yields or quality of crops or plants but do not contain recognized plant nutrients. A regulation passed by the General Assembly in 1979 requires such products to be registered. This regulation has prevented consumers from buying some products of very questionable value.



SUMMARY OF FERTILIZER ACTIVITIES

JULY 1, 2023- JUNE 30, 2024

Licenses/ Products:

Total Number of Registrants	579
Total Number of Restricted Use Permits	61
Total Number of General Use Permits	311
Total Number of Products Registered	5856

Fertilizer Lab Report:

Total Tons of Reported Fertilizer	427,772
Number of fertilizer samples analyzed	2302
Overall Index Value:	109.04%

Nutrient	# Samples Tested	# Deficient	% Deficient
Nitrogen	1696	13	0.8
$P_2 0_5$	718	72	10.0
$K_2 0$	1205	55	4.6
Mg	320	20	6.2
Ca	126	24	19.0
Cu	44	19	43.2
S	762	53	7.0
Zn	157	26	16.6

Total guaranteed samples:	2259
Research samples:	43
Total samples not meeting guarantee	264
Percent of fertilizer samples deficient	11.69%
Penalties assessed for deficient analysis	$105,669.93

SUMMARY OF LIMING ACTIVITIES

JULY 1, 2023- JUNE 30, 2024

Lime and Landplaster Tonnage	379,820
Lime and Landplaster Samples Analyzed	201
Lime and Landplaster Samples Deficient	92
Lime and Landplaster Permits	86
Lime and Landplaster Products Registered	72

SUMMARY OF SOIL AMENDMENT ACTIVITES

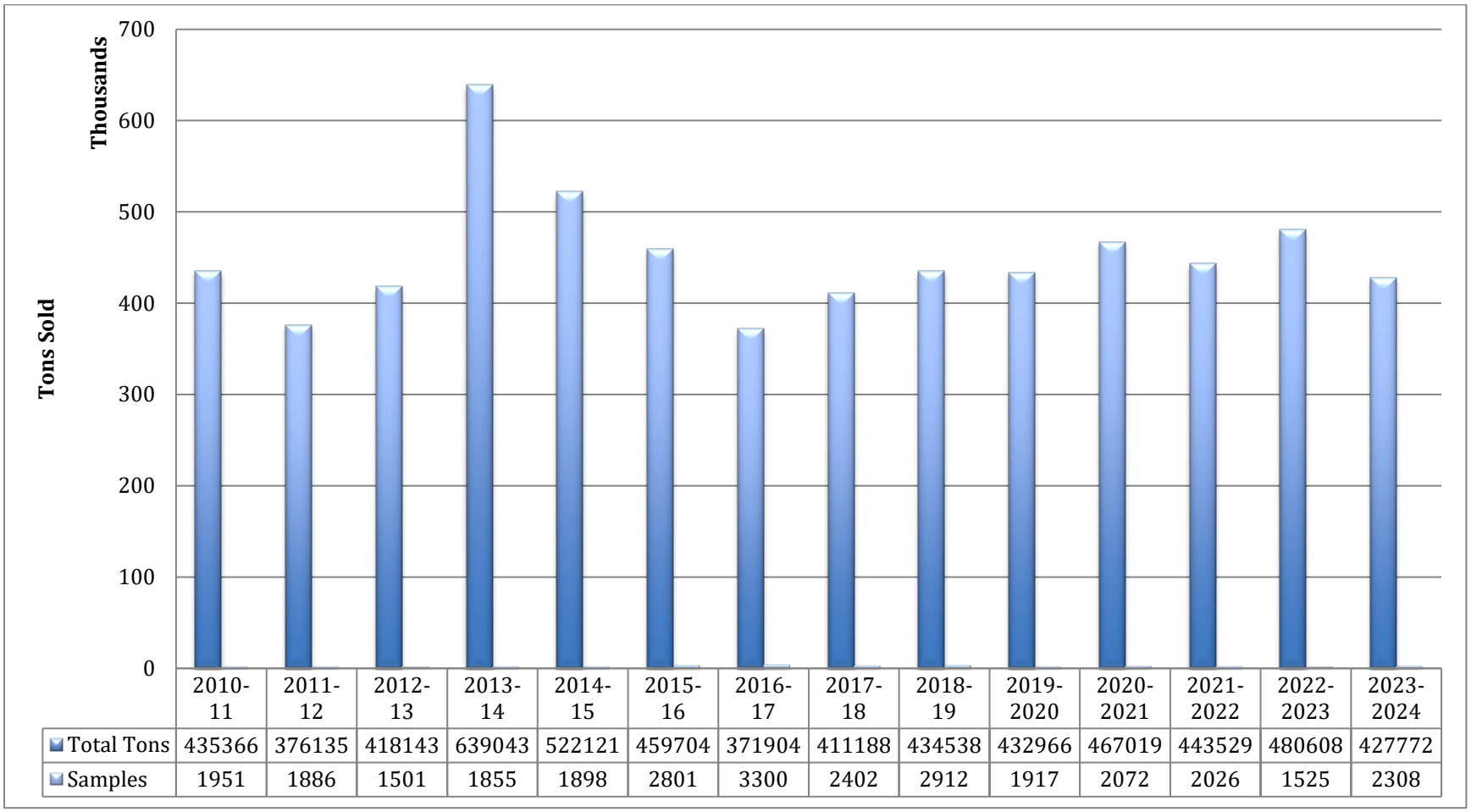
JULY 1, 2023- JUNE 30, 2024

Soil Amendment Companies	172
Soil Amendment Products	667
Soil Amendment Tonnage	6,346.7

The Fertilizer Laboratory participates monthly in the national Magruder Fertilizer Proficiency Testing Program. Test samples are shipped to the lab for analysis of various nutrients, including N, P, K, and S, at a range of guarantees. The Fertilizer Lab's test results are submitted to the program for review and statistical analysis. Reports of the Clemson Fertilizer Lab proficiency testing from 2023-24 are included in the table, indicating continued satisfactory testing for N, P, K, and S.

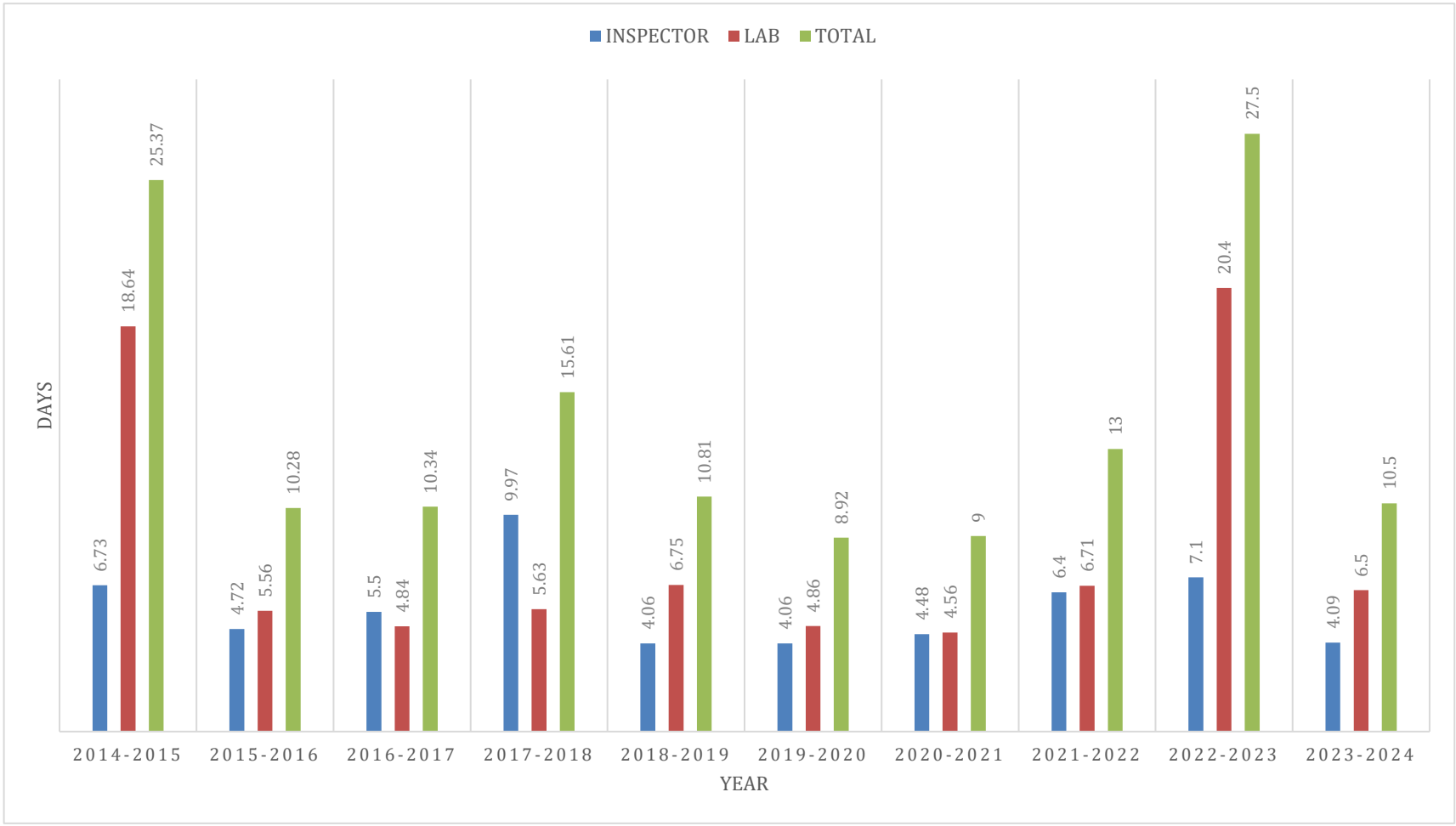
Magruder Fertilizer Proficiency testing Program						
			Value	Rob Mean	Z Score	%RSD
Sample	Analyte Name and Method (Units)	Sample Name	Lab Data	Method Values	Magruder CS	Threshold
231011	Total S, Other (17%)	Gypsum	16.9	17.17	-0.2	OK
231111	Acid Soluble B, Other (2.5%)	High Micros	2.497	2.504	-0.06	OK
231111	Acid Soluble Cu, Other (10%)	High Micros	10.6	10.24	1.18	OK
240111	Total S, Other (10%)	MAP/Zn	9.756	9.856	-0.14	OK
240213	Total N, Combustion (46%)	Urea 46-0-0	46.28	46.33	-0.11	OK
240311	Soluble K2O, ICP (Citrate-EDTA) (4%)	Grade 8-30-4	4.428	4.448	-0.06	OK
240311	Acid Soluble Mn, Other (0.5%)	Grade 8-30-4	0.13	0.1223	0.47	OK
240311	Acid Soluble Zn, Other (0.1%)	Grade 8-30-4	0.223	0.2185	0.12	OK
240411	Acid Soluble Ca, Other (9%)	Macro-Micro-Humic	8.756	8.625	0.2	OK
240411	Acid Soluble Fe, Other (1%)	Macro-Micro-Humic	1.447	1.397	0.39	OK
240411	Acid Soluble Zn, Other (2%)	Macro-Micro-Humic	2.955	2.755	0.85	OK
240611	Acid Soluble Ca, Other (19%)	Calcium Nitrate	19.61	18.88	1.27	OK
240811	Direct Available P2O5, ICP, Citrate-EDTA Ext. (7%)	Grade 21-7-14	7.24	6.905	1.27	OK
240811	Total S, Other (5.1%)	Grade 21-7-14	5.088	5.078	0.05	OK
	Interpreting Z Scores and Flags					
			Flags:			
	Z Scores:		0=Used			
Evaluation of your lab result with respect to other lab results			1 = Rejected for duplicates too far apart			
Green is Compliant (>-2 and < 2 standard deviations)			2 = Rejected as extreme outlier			
Orange is cautionary (> -3 and < 3 standard deviations)			3 = remove from stats			
Red is Warning (3 standard deviations)			4 = rejected due to 0's submitted			
			5 = LOD			

FERTILIZER TONS SOLD AND SAMPLE COLLECTION



	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
Total Tons	435366	376135	418143	639043	522121	459704	371904	411188	434538	432966	467019	443529	480608	427772
Samples	1951	1886	1501	1855	1898	2801	3300	2402	2912	1917	2072	2026	1525	2308

FERTILIZER SAMPLE TURN AROUND TIME



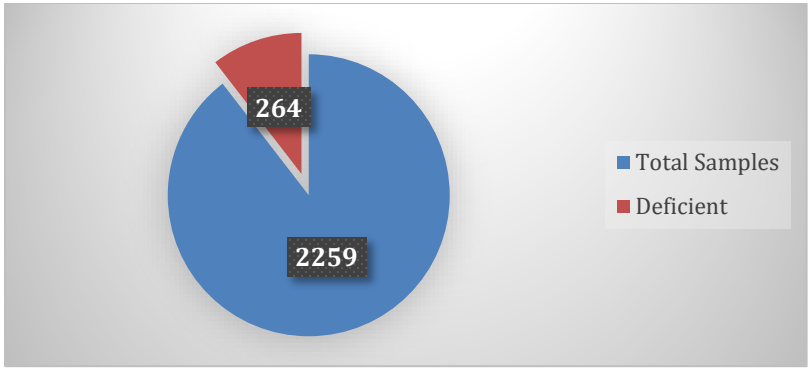
FERTILIZER MOVEMENT AND QUALITY CONTROL IN 2023-2024

During the 2023-2024 fertilizer year, Fertilizer prices fell back to "normal" prices, however with low commodity prices and drought, fertilizer sales have decreased in the last year by about 50,000 tons.

Our team of inspectors pulled 2259 regulatory samples that were analyzed in the lab. Of those samples, which are representative of the fertilizer manufacturing and sales in South Carolina, we had a deficiency rate of 11.7%, this is higher than the previous year, but still well below the national average.

The fertilizer lab's average turnaround time was 10.5 days (workdays) from the time the sample is taken in the field until it is analyzed in the laboratory. This turnaround time decreased significantly from last year. The fertilizer lab completed their move in 2023 and was fully functional for the 23-24 fertilizer year.

At the conclusion of the 2023-2024 fertilizer year three fertilizer registrants have been placed on probation due to having over 20 percent of samples taken found to be deficient beyond the investigational allowance. The registrants have been notified and probation will be on going until July 1, 2025.



PENALTIES FOR DEFICIENCIES IN GUARANTEED ANALYSIS

When a fertilizer is found to be deficient beyond the limits allowed under the law and/or regulations, the farmer is entitled to a penalty from the registrant of three times the commercial value of the entire deficiency in the case of nitrogen, phosphoric acid and potash. When the chlorine content of any lot branded for tobacco exceeds the maximum amount guaranteed by more than one-half of one percent, there is a penalty of ten percent of the value of the fertilizer for each additional one-half of one percent of excess or fraction thereof. The analytical tolerances allowed by regulations are:

Plant Nutrients, Guarantees, Tolerances and Penalties.

A. Nitrogen, phosphorus, potassium.

A fertilizer guaranteed to contain one or more of the elements, nitrogen, phosphorus, and potassium shall be deemed deficient if the analysis of the nutrient is below the

Guarantee %	Nitrogen %	Available Phosphoric Acid %	Potash %
4 or less	0.50	0.79	0.53
5	0.66	0.82	0.58
6	0.70	0.85	0.65
7	0.75	0.89	0.74
8	0.79	0.92	0.84
9	0.84	0.95	0.92
10	0.88	0.99	1.00
12	0.97	1.05	1.15
14	1.05	1.12	1.29
16	1.15	1.18	1.42
18	1.24	1.25	1.55
20	1.33	1.32	1.68
22	1.41	1.39	1.81
24	1.50	1.45	1.93
26	1.59	1.51	2.05
28	1.67	1.58	2.17
30	1.76	1.65	2.29
32 or more	1.84	1.72	2.40

guarantee by an amount exceeding the values in the following schedule. The schedule is the investigational allowances shown in the Association of American Plant Food Control Officials Uniform State Fertilizer Bill (official 1982) plus three (3) percent of the guarantee. The fertilizer is also deemed deficient if the overall index value of the fertilizer is below 98 percent.

A fertilizer shall not be deemed deficient when the overall index value equals or exceeds 100 percent and no more than one primary nutrient is below the guarantee and if the deficiency does not exceed two units or ten percent of the guarantee.

B. **Additional Plant Nutrients**.

(1) Registration and Guarantees. When mentioned in any form or manner, said additional plant nutrients, besides nitrogen, phosphorus and potassium, shall be registered and guaranteed. The sources of the elements guaranteed shall be shown on the application for registration.

(2) Deficiencies in Plant Nutrients Besides Nitrogen, Phosphorus and Potash.
A deficiency tolerance amounting to 25% of the guarantee shall be allowed for elements not otherwise specified by law or regulation; provided that in no case shall the tolerance exceed 0.50%. (1/2 unit). For each deficiency in secondary or micro-nutrient element, a penalty of $1.00 per ton, plus four times the commercial value of the shortage shall be paid to the ultimate user of their fertilizer.

Boron (B) When Found Excessive. The following penalties will be assessed when the analysis found exceeds the guarantee by more than .1% boron (B).

(a) Up to and including .028% boron $3.00 per ton

(b) Exceeding .028% boron and including .057% boron $5.00 per ton

(c) Exceeding .057% boron $10.00 per ton

When the number of fertilizer samples taken from fertilizer sold by a registrant or a particular plant operated by a registrant is found to be deficient by more than 20 percent of the total samples taken during a fiscal year, the registrant will be considered for probation. If unusual circumstances contribute to the high incidence of deficiencies, probation may be deferred and a warning will be given. In the year following probation, the registrant will notify the Department of Fertilizer Regulatory and Certification Services when the plant will be in operation to give inspectors an opportunity to sample no less than 30 lots. If the ownership of a plant where 20 percent or more of the samples has been found to be deficient has been transferred, the plant is still considered to be under probation.

In this trial year, if more than 20 percent of samples taken are found to be deficient beyond the investigational allowance, the registrant will be given a hearing. If the registrant cannot show cause as to why registration should not be revoked or refused the registrant or plant will not be granted registration or license. A registrant who has had registration revoked for conditions described in this rule may apply for reinstatement of registration after a period of not less than 90 days by presenting in writing to the Board documentary evidence of corrective action which will reduce the number of deficiencies.

RELATIVE COMMERCIAL VALUES

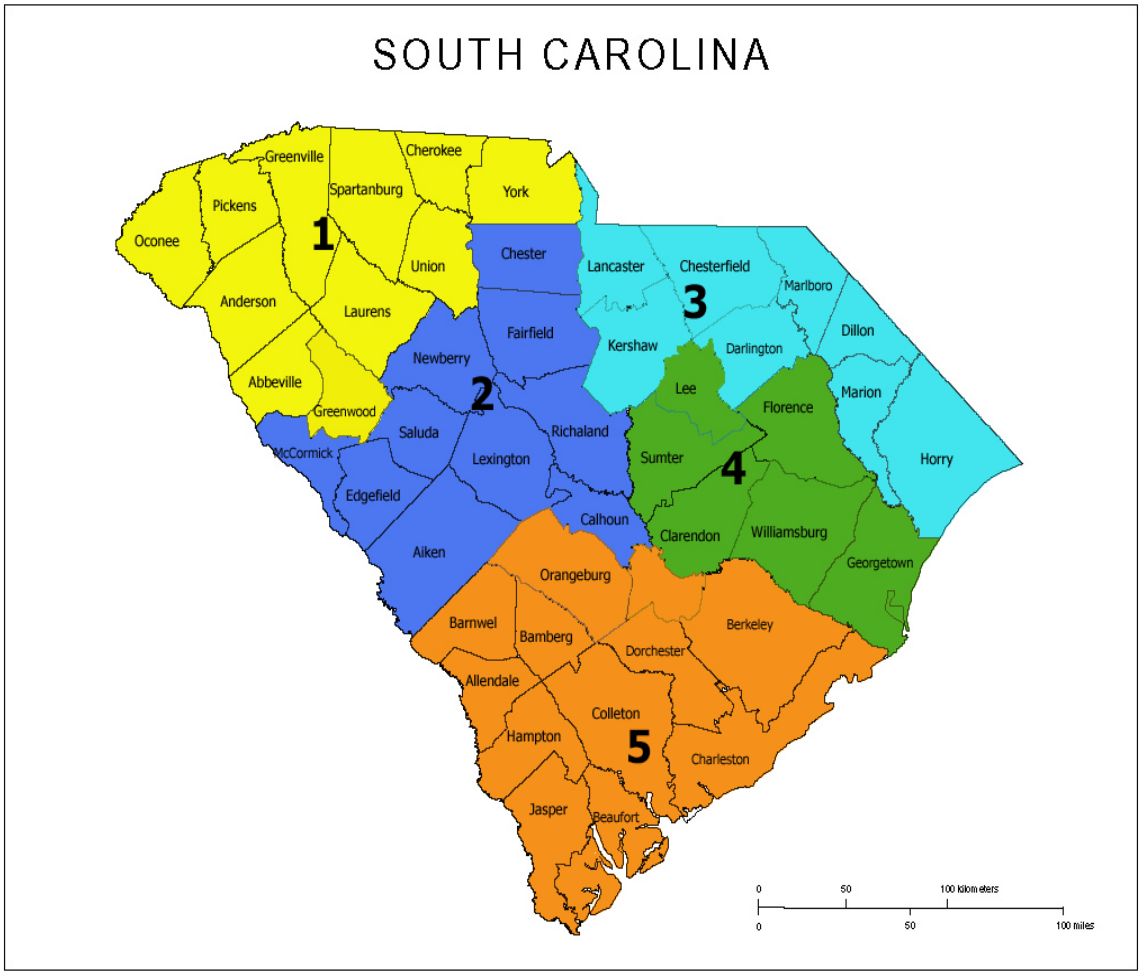
Listed below are the commercial values used in calculating the payment to the farmer when the analysis indicated a shortage of plant nutrients. These values represent the average of cash values at the ports, as reported by the manufacturers on February 15, 2024. They do not include the price of bagging, handling, and freight. These values are not intended to represent the selling price of fertilizers. They are used only to calculate the payments to farmers when a deficiency is found in analysis.

Nutrients	Dollars/Unit (20 LBS.)
Water Soluble Nitrogen	13.69
Water Insoluble Nitrogen	14.00
SCU N	20.00
Nitrate Solutions 19-35%	9.00
Urea 46%	11.13
Ammonium Nitrate	13.24
Nitrate of Soda	15.00
Calcium Nitrate	41.35
Sulfate of Ammonia	13.50

Ordinary Superphosphate	15.00
Conc Superphosphate	14.46
Muriate of Potash	7.20
Sulfate of Potash	15.75
Sulfate of Potash Magnesia	11.43
Available phosphoric acid	14.83
Soluble Potash	10.00
Nutrient	**Dollars/pound of nutrient**
Calcium	0.56
Magnesium	1.30
Sulfur	0.41
Boron	4.11
Copper	10.00
Iron	0.86
Manganese	1.65
Zinc	2.38
Molybdenum	23.00

2011-2024 Fertilizer Tonnage Number of Samples Procured and Analyzed, Number of Samples Found Deficient

					# OF EXCESSIVE OR DEFICIENT		
YEAR	# TONS SOLD	# SAMPLES REPORTED	DEF. IN ONE OR MORE NUTRIENTS	% DEFICIENT	N	P205	K20
2011-12	376,135	1886	302	16.01	79	64	73
2012-13	418,143	1501	221	14.70	69	24	34
2013-14	639,043	1855	219	12.50	48	25	44
2014-15	522,121	1898	231	12.17	51	11	34
2015-16	459,704	2801	268	9.57	56	8	40
2016-17	371,904	3300	338	9.76	32	46	83
2017-18	441,118	2402	150	6.24	23	12	30
2018-19	434,538	2913	131	4.2	25	8	36
2019-20	432,966	1944	161	8.40	13	9	47
2020-2021	468,019	2072	133	6.4	25	11	55
2021-2022	443,529	2010	162	8.0	41	41	14
2022-2023	480,608	1489	116	7.8	16	33	39
2023-2024	427,772	2259	264	11.7	13	72	55



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