

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 146
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Accreditation No: LAB 146

Awarded to

SOIL AND WATER TESTING LABORATORY, GULBURG ROAD, MODAL TOWN-A, BAHAWALPUR, PAKISTAN

The scope of accreditation is in accordance with the standard specifications outlined in the following page(s) of this document. The accredited scope shall be visible and legible in areas such as customer service, sample-receiving section etc and shall not mislead its users.

The accreditation was first time granted on **29-06-2018** by Pakistan National Accreditation Council.

The laboratory complies with the requirements of **ISO/IEC 17025:2017**.

The accreditation requires regular surveillance, and is valid until **27-06-2027**.

The decision of accreditation made by Pakistan National Accreditation Council implies that the organization has been found to fulfill the requirements for accreditation within the scope.

The organization however, itself is responsible for the results of performed measurements/tests.

PAKISTAN NATIONAL ACCREDITATION COUNCIL

19/08/2024
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Director General

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 18/08/2020 Rev. No: 09 LAB 146
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**Testing Laboratory. SOIL AND WATER TESTING LABORATORY FOR
RESEARCH GULBURG ROAD, MODAL TOWN-A BAHAWALPUR PAKISTAN**

Permanent laboratory premises

Materials/Products tested	Testing field (e.g. environmental testing or mechanical testing)	Types of test/ Properties measured	Reference to standardized method (e.g. ISO 14577-1:2003)/ Internal method reference
Nitrogen Fertilizer	Chemical testing	Ammonical Nitrogen (Single/ Mixture/ Solid / Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20th Edition, 2016, Method No.2.4.10 (AOAC Official Method 892.01), Fertilizer Chapter 2 Page 15. (SWTBWL/SOP/L3/01)
Nitrogen Fertilizer	Chemical testing	Nitrate Nitrogen (Single/ Mixture/ Solid / Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20th Edition, 2016, . Method No.2.4.10 (AOAC Official Method 892.01), Fertilizer Chapter 2 Page 15. (SWTBWL/SOP/L3/01)
Nitrogen Fertilizer	Chemical testing	Total Nitrogen (Single/ Mixture/ Solid / Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization,

19/08/2024
Date

Sd
Director



**ACCREDITATION
DOCUMENT**

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 146

			New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20th Edition, 2016, . Method No.2.4.10 (AOAC Official Method 892.01), Fertilizer Chapter 2 Page 15. (SWTBWL/SOP/L3/01)
Nitrogen Fertilizer	Chemical testing	Ureic Nitrogen (Single/ Mixture/ Solid / Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20th Edition, 2016, . Method No.2.4.10 (AOAC Official Method 892.01), Fertilizer Chapter 2 Page 15/ (SWTBWL/SOP/L3/01)
Phosphate Fertilizer	Chemical testing	Citrate Soluble Phosphorus Estimation (Single/ Mixture/ Solid / Liquid)	Pakistan standard for Single Super phosphate (2nd edition) PS: 67-1996. PSQCA. Karachi. (SWTBWL/SOP/L3/02)
Potassium fertilizer	Chemical testing	Water Soluble Potassium (Single/ Mixture/ Solid / Liquid)	Pakistan Standard Specification for potassium Sulphate PS: 1501/2011 (2nd Revision) ICS: 65.080 PSQCA Karachi. Flame photometer (SWTBWL/SOP/L3/03)
Zinc Fertilizer	Chemical testing	Water Soluble Zinc (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20th Edition, 2016 Method No.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30. (Atomic Absorption Spectrophotometry) (SWTBWL/SOP/L3/05)

19/08/2024
Date

Sd
Director



**ACCREDITATION
DOCUMENT**

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 146

Zinc Fertilizer	Chemical testing	Acid Soluble Zinc (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20th Edition, 2016 Method No.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30. (Atomic Absorption Spectrophotometry) (SWTBWL/SOP/L3/06)
Iron Fertilizer	Chemical testing	Acid Soluble Iron (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20th Edition, 2016 Method No.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30. (Atomic Absorption Spectrophotometry) (SWTBWL/SOP/L3/06)
Copper Fertilizer	Chemical testing	Acid Soluble Copper (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20th Edition, 2016 Method No.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30. (Atomic Absorption Spectrophotometry) (SWTBWL/SOP/L3/06)
Manganese Fertilizer	Chemical testing	Acid Soluble Manganese (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20th Edition, 2016 Method No.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/(Atomic Absorption Spectrophotometry) (SWTBWL/SOP/L3/06)
Boron Fertilizer	Chemical testing	Water Soluble Boron (Single/ Mixture/ Solid / Liquid)	Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No 2.6.04 (AOAC Official method 982.01), Fertilizer Chapter 2, Subchapter 6, Page 31. (SWT BWL/SOP/L3/04)

19/08/2024
Date

Sd
Director



ACCREDITATION DOCUMENT

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 146

Chelated Zinc	Chemical testing	Chelated Zinc (Single/ Mixture/ Solid / Liquid)	<p>1. Vogel's Textbook of Quantitative Chemical Analysis, 6th Edition, J Mendham, R c Denney, J D Barnes, M J K Thomas</p> <p>2. Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No 2.6.01 (AOAC Official method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30.</p> <p>(SWTBWL/SOP/L3/10)</p>
Organic Matter	Chemical testing	Organic Matter (Single/ Mixture/ Solid)	<p>i. AOAC International, 20th Edition, 2016, Method No 2.7.08 (AOAC Official method 967.05), Fertilizer Chapter 2, Subchapter 7, Page 54</p> <p>ii. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162.</p>
Humic Acid	Chemical testing	Humic Acid (Solid / Liquid)	<p>ISO 19822:2018 https://www.iso.org/standard/66271.html.</p> <p>(SWTBWL/SOP/L3/08)</p>
Organic Matter	Chemical testing	Cation Exchange Capacity (Single/ Mixture/ Solid)	<p>Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No. 2.7.13 (AOAC Official Method 973.09), Fertilizers Chapter 2, Subchapter 7 Page 56.</p> <p>(SWTBWL/SOP/L3/09)</p>
Sulphur	Chemical testing	Sulphur (Single/ Mixture/ Solid / Liquid)	<p>i. Diagnosis and Improvement of Saline and Alkali Soils, USDA, Handbook Book No. 60 pp 146</p> <p>ii. Official Method of Analysis of AOAC International, 20th Edition, 2016 AOAC Official Method 980.02 Method No. 2.6.28 Page 39</p>

19/08/2024
Date

Sd

Director



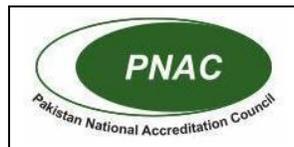
**ACCREDITATION
DOCUMENT**

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 146

			<p>iii.Pakistan Standard Specification for SOP Fertilizer Grade PS:1501-2011 @ ICS:65.080 Pakistan Standards and Quality Control Authority, Karachi.</p> <p align="center">(SWTBWL/SOP/L3/12)</p>
Chloride	Chemical testing	Total Chlorides (Single/ Mixture/ Solid / Liquid)	<p>i.Diagnosis and Improvement of Saline and Alkali Soils, USDA, Handbook Book No. 60 pp 146</p> <p>ii.Official Method of Analysis of AOAC International, 20th Edition, 2016 AOAC Official Method 928.02 Method No. 2.6.09 page 33</p> <p>iii.Pakistan Standard Specification for SOP Fertilizer Grade PS:1501-2011 @ ICS:65.080 Pakistan Standards and Quality Control Authority, Karachi</p> <p align="center">(SWTBWL/SOP/L3/13)</p>
Amino Acid	Chemical testing	Total Amino Acid (Protein Base) (Solid / Liquid)	<p>Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No. 2.4.10 (AOAC Official Method 892.01), Fertilizers Chapter 2 Page 15 ii. FAO nutritional studies no 24(1970). iii. Pellet, L P and Young (1980). iv. Theymoli Balasubramanian, Sadasivam (1987). v. www.eplantsceinece.com</p>
Total P in BOP	Chemical test method	Total P (Single/ Mixture/ Solid / Liquid)	<p>Pakistan standard for BOP.PS:5295/2017 (2ndRev.), PSQCA. Karachi.</p>

19/08/2024
Date

Sd
Director



**ACCREDITATION
DOCUMENT**

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 146

Zn in Urea Zn	Chemical/ashed method	Zinc in Urea (Single/ Mixture/ Solid / Liquid)	Bioactive Zinc in BNFF urea Zn PSQCA 5336/2015
pH	Chemical Testing	pH in Fertilizer (Single/ Mixture/ Solid / Liquid)	i.George Estefan, Rolf Sommer, and John Ryan 2013. Methods of Soil, Plant and Water Analysis: A Manual Fot the West Asia and North Africa region. (ICARDA) ii. Official Method of Analysis of AOAC International, 20th Edition, 2016 AOAC Official Method 2.7.05 Method No. 973.04 chapter 2, page 53
Calcium	Chemical Testing	Water soluble Calcium in fertilizer (Single/ Mixture/ Solid / Liquid)	Manual of Flame photometer Methods

19/08/2024
Date

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