Accreditation No: LAB 292

Awarded to
Fatima Fertilizer Company Ltd,
Soil and Water Testing Laboratory (SWTL)
Technical Services Department, Marketing Division
Pak Arab Fertilizer Ltd, Khanewal Road, Multan, 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 **05-09-2023** by Pakistan National Accreditation Council.

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

The accreditation requires regular surveillance, and is valid until **04-09-2026.**

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

05-09-2023
Date

SD
Director General

Testing Laboratory.

Accreditation Scope Fatima Fertilizer Company Ltd, Soil and Water Testing Laboratory (SWTL), Technical Services Department, Marketing Division, Pak Arab Fertilizer Ltd, Khanewal Road, Multan, Pakistan

Permanent laboratory premises [X]

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
Soil	Physical Testing	1. Saturation Percentage (%)	**SWTL-SOP-01** Based on • Analysis manual for Soils, Plants and Waters (Revised 1984) prepared by Malik at el., Soil Fertility Survey and Soil Testing Institute, Depart of Agriculture, Punjab Lahore. • Robert O Miller, Colorado State University , USA
	Chemical Testing	1. pH (1:1)	**SWTL-SOP-02** Based on Method No 5.2, page # 65 – 66, George Estefan, Rolf Sommer, and John Ryan 2013. Methods of Soil, Plant, and Water Analysis: A manual for the West Asia and North Africa region. International Center for Agricultural Research in the Dry Areas (ICARDA).
		2. EC (1:1)	**SWTL-SOP-03** Based on Method No. S-2.30, Page # 46-47. Soil, Plant and Water Reference Methods for the Western Region, 2005. 3rd Edition. **Soil EC (1:1)** Soil:DI Water Ratio 1:1 Method.
		3. Soil Extractable Sodium & Potassium (Na & K)	**SWTL-SOP-04** Based on • Method No. S-5.10, Page # 95-96. Soil, Plant and Water Reference Methods for the Western Region,

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Director

			2005. 3rd Edition. Extractable Potassium, Calcium, Magnesium, and Sodium. • International Center for Agricultural Research in Dry Areas (ICARDA) Manual 2013.
		4. Soil Organic Matter (Walkley-Black)	**SWTL-SOP-06** Based on • Walkley, A. 1947. A critical examination of a rapid method for determining organic carbon in soils – effect of variations in digestion conditions and of inorganic soil constituents. Soil Sci. 63:251-264. • Method No. 19, Page # 26-27. SFRI-Guide-2: 2021, Soil and Water Analysis Manual. Determination of Soil Organic Matter.
		5. Soil Available Phosphorous (Olsen P)	**SWTL-SOP-07** Based on • Olsen, S. R., C. V. Cole, F. S. Watanabe, and L. A. Dean. 1954. Estimation of available phosphorus in soils by extraction with sodium bicarbonate. USDA Circ. 939. pp. 19. • Method No. 22, Page # 32-33. SFRI-Guide-2: 2021, Soil and Water Analysis Manual. Determination of Extractable Soil Phosphorus (Olsen's Method).
Water	Chemical Testing	1. Calcium (Ca)	**SWTL-SOP-08** Based on • Method No. 9.9, Page # 191-193. 3rd Edition, International Center for Agricultural Research in Dry Areas (ICARDA) Manual 2013. Calcium and Magnesium in Water. • Method No. 34, Page # 52-53. SFRI-Guide-2: 2021, Soil and Water Analysis Manual. Determination of Calcium and Magnesium in Water.
		2. pH	**SWTL-SOP-09** Based on Method No. 9.1 Page # 168-170,

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			ICARDA, 2013. 3rd Edition. Methods of Soil, Plant, and Water Analysis.
		3. EC	**SWTL-SOP-10** Based on • Method No. 9.2 Page # 170-171, ICARDA, 2013. 3rd Edition. Methods of Soil, Plant, and Water Analysis. Electrical Conductivity of Water. • Method No. 31, Page # 47. SFRI-Guide-2: 2021, Soil and Water Analysis Manual. Determination of Electrical Conductivity of Water.
		4. Chloride (Cl)	**SWTL-SOP-12** Based on • Method No. 32, Page # 48-49. SFRI-Guide-2: 2021, Soil and Water Analysis Manual. Determination of Carbonate and Bicarbonate in Water. • Method No. 33, Page # 50-51. SFRI-Guide-2: 2021, Soil and Water Analysis Manual. Determination of Chloride in Water. • Method No. 9.10 & 9.11,Page # 194 -197, ICARDA, 2013. 3rd Edition. Methods of Soil, Plant, and Water Analysis. Carbonates, Bicarbonates & Chloride in Water.
		5. Bi-Carbonate (HCO_3)	
		6. Sodium Absorption Ratio (SAR)	**SWTL-SOP-14** Based on • Method No. 37, Page # 57. SFRI-Guide-2: 2021, Soil and Water Analysis Manual. Determination of Sodium Adsorption Ratio in Water. • United States Salinity Laboratory Staff. 1954. Diagnosis and improvement of saline and alkali soils. USDA Handbook 60. Washington, D.C.

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