



SWRDO Better Cotton Project Rajanpur

District Soil Profile



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Need For District Soil Profiling

SWRDO Is working as Program Partner of Better cotton Project in Pakistan since 2017. Mission and vision of SWRDO is to Uplift rural communities through skill enhancement, capacity building and bridging relevant stakeholders for sustainable development. Healthy soil is the starting point for farm productivity and sustainability. It is also often the most neglected and under appreciated resource in farming. This leads to poor soil management, resulting in low yields, soil depletion, wind erosion, surface runoff, land degradation and climate change (both local and global).

- ☆ Climate change causes are disturbed rainfall patterns and worsening droughts in many cotton producing regions, healthy soil could become the farmer's main asset for climate resilience and climate mitigation. Improved soil management brings a variety of benefits to farmers
- ☆ SWRDO analyzed to keep sustainable development on track for its mainstreaming, District Level Soil Profile is immediate need. So SWRDO took an initiative to develop district soil profile collaboration with academia (Ghazi university D G Khan).

Better Cotton Intent

- ☆ Identifying and analyzing soil type
- ☆ Maintaining and enhancing soil structure
- ☆ Maintaining and enhancing soil fertility
- ☆ Continuously improving nutrient cycling

Study Design

- ☆ SWRDO Engaged Ghazi university Dera ghazi khan for collaborative activity regarding Soil health management
- ☆ Designing of Data collection template
- ☆ Capacity building of staff on soil samples & data collection
- ☆ Composite soil samples collection from 0-15 cm depths for crops and vegetables.
- ☆ Total 500 Samples were collected (Almost 50% Samples as per BC Criteria)



Parameters

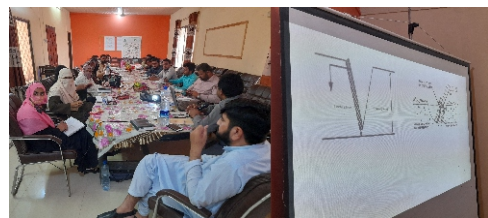
1. Soil Type
2. Nitrogen (N)
3. Phosphorus (P)
4. Potassium (K)
5. Soil Organic Matter (O.M)

Stakeholders Engagement

- ☆ Farmers
- ☆ Agriculture extension department
- ☆ Ghazi university D G Khan
- ☆ Soil and water testing lab

Consultation

500 Farmers were consulted for soil sample data collection (50% Samples as per BC Criteria)



Soil Testing and Improvement Recommendation

Experts from Ghazi University D G Khan Carry out soil testing as per standard protocols. Ghazi University developed results on the basis of soil samples along with UC Wise Soil recommendation to maintain the health of Soil.



Concept and Survey of Soil Health Of District Rajanpur

Objectives:

The objective of this study is

- ☆ To assess and demonstrate the status of the soil health indicators, and develop a framework for a decision support tool for on-farm assessment, prediction, and management of soil health.
- ☆ To identify key sustainability Issues regarding soil health management
- ☆ To establish the complete soil survey and compile the report on the basis of soil health indicators (soil texture, soil nutrients status, soil organic matter status and soil pH).

Methodology

Composite soil samples from all tehsils (Jampur, Rojhan and Rajanpur) of district Rajanpur were collected from different coordinates at 0-15 cm depths for crops and vegetables. Soil samples were collected from each union council of Rajanpur district and from various vegetative cover area. Total # of Samples collected were 500. Soil Samples were air dried, passed through 2 mm sieve and analyzed for soil texture, by measuring saturation percentage of soils, nutrients status (Nitrogen, phosphorus and potassium), organic matter contents.



Result and Localized site specific recommendation

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Jampur	Allah Abad Gharbi	0.93	7.86	0.29	5.97	156.5	0.01	Clay loam	<ol style="list-style-type: none"> 1. Need to add 209 kg urea, 75 kg DAP and 71 kg SOP 2. Need to add farm yard manure and compost during soil preparation for the improvement of OM status.
Jampur	BakhirPur	0.6	7.82	0.35	7.89	156	0.02	Calcareous, clayey texture	<ol style="list-style-type: none"> 1. Need to add 211 kg urea, 79 kg DAP and 72 kg SOP 2. Need to add farm yard manure and gypsum during soil preparation for the improvement of soil health.
Jampur	Bukhara	0.7	8.06	0.31	7.15	154.5	0.01	Strongly Calcareous, clayey texture	<ol style="list-style-type: none"> 1. Need to add green manure and compost during soil preparation for the improvement of soil health. 2. Need to add 169 kg urea, 151 kg NP and 69 kg SOP
Jampur	BurrayWala	0.57	7.91	0.32	8.51	162.92	0.01	Strongly Calcareous, clayey Loam texture	<ol style="list-style-type: none"> 1. Need to add farm yard manure and gypsum during soil preparation for the improvement of soil health 2. Need to add 214 kg urea, 71 kg DAP and 68 kg SOP
Jampur	Dajal	0.88	7.77	0.31	8.79	166	0.01	Calcareous, clay loam	<ol style="list-style-type: none"> 1. Need to add farm yard manure during soil preparation for the improvement of soil health. 2. Need to add 209 kg urea, 80 kg DAP and 69 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Jampur	Hairo	0.36	7.83	0.33	6.92	164.2	0.02	Calcareous, Clay loam	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure into soil and irrigate with good quality water then plough and prepare for sowing. 2. Need to add 211 kg urea, 72 kg DAP and 68 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Jampur	HajiPur	0.67	7.63	0.34	8.56	167.2	0.02	Calcareous , loamy	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 204 kg urea, 84 kg DAP and 70 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Jampur	JhokMahar	0.71	8.23	0.37	6.13	159.44	0.02	Calcareous , loamy	<p>Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing</p> <p>Need to add 204 kg urea, 84 kg DAP and 70 kg SOP</p> <p>It's better to use bio-stimulants spray on vegetative stage and flowering stage.</p>
Jampur	KotlaDeewan	0.45	8.05	0.28	5.52	175	0.01	Calcareous , Clay loam	<p>Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing</p> <p>Need to add 213 kg urea, 62 kg DAP and 64 kg SOP</p> <p>It's better to use bio-stimulants spray on vegetative stage and flowering stage.</p>
Jampur	KotlaMughlan	0.43	7.74	0.37	10.71	180	0.02	Loamy soil	<p>Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing</p> <p>Then need to add 204 kg urea, 78 kg DAP and 72 kg SOP</p>
Jampur	Muhammad Pur	0.76	7.93	0.3	8.22	159.15	0.014	Clay loam	<p>Need to add 214 kg urea, 74 kg DAP and 70 kg SOP</p> <p>It's better to use bio-stimulants spray on vegetative stage and flowering stage.</p>

Tehsil	Union Councils	EC ds/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Jampur	Nawanbaigraj	0.58	8.68	0.3	5.36	165.4	0.014	Sandy loam	Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing Need to add 1/3 of 207 kg urea at sowing time, 1/3 at 2 nd irrigation and 1/3 at flowering stage. while 91 kg DAP and 76 kg SOP at sowing time. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Jampur	ManjhuWala Noor Pur	2.2	7.9	0.3	4.6	142.6	0.012	Clayey	Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing Then need to add 211 kg urea, 78 kg DAP and 68 kg SOP
Jampur	NoushehraGhar	1.01	7.92	0.32	7.36	147.77	0.07	Clayey	1. Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Then need to add 210 kg urea, 79 kg DAP and 66 kg SOP
Jampur	PeeroWala	0.5	7.92	0.32	7.17	172	0.015	Clay loam	1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 1/3 of 210 kg urea at sowing time, 1/3 at 2 nd irrigation and 1/3 at flowering stage. while 78 kg DAP and 69 kg SOP at sowing time. 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage
Jampur	Tatarwala	0.5	7.9	0.3	7.2	162.3	0.014	loamy	Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing Need to add 207 kg urea, 69 kg DAP and 63 kg SOP
Jampur	Tufki	0.7	8.05	0.32	7.23	154.57	0.015	Loam	1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 209 kg urea, 80 kg DAP and 66 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Jampur	Nawanbaigraj	0.58	8.68	0.3	5.36	165.4	0.014	Sandy loam	Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing Need to add 1/3 of 207 kg urea at sowing time, 1/3 at 2 nd irrigation and 1/3 at flowering stage. while 91 kg DAP and 76 kg SOP at sowing time. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Jampur	Noor Pur ManjhuWala	2.2	7.9	0.3	4.6	142.6	0.012	Clayey	Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing Then need to add 211 kg urea, 78 kg DAP and 68 kg SOP
Jampur	NoushehraGhar	1.01	7.92	0.32	7.36	147.77	0.07	Clayey	1. Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Then need to add 210 kg urea, 79 kg DAP and 66 kg SOP
Jampur	PeeroWala	0.5	7.92	0.32	7.17	172	0.015	Clay loam	1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 1/3 of 210 kg urea at sowing time, 1/3 at 2 nd irrigation and 1/3 at flowering stage. while 78 kg DAP and 69 kg SOP at sowing time. 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Jampur	Tatarwala	0.5	7.9	0.3	7.2	162.3	0.014	loamy	Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing Need to add 207 kg urea, 69 kg DAP and 63 kg SOP
Jampur	Tufki	0.7	8.05	0.32	7.23	154.57	0.015	Loam	1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 209 kg urea, 80 kg DAP and 66 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Rajampur	Asni	0.53	7.91	0.33	9.44	161.8	0.015	Clayey	<ol style="list-style-type: none"> 1. Need to add 105 kg urea, 77 kg DAP and 22kg SOP 2. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	Bait Sontra	0.57	7.83	0.33	9.18	173.5	0.015	Sandy loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 104 kg urea, 78 kg DAP and 33kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	ChakhLasa	0.43	8.23	0.29	6.12	167	0.013	loamy	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 103 kg urea, 86 kg DAP and 36kg SO 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	Dheegan	0.36	8.14	0.3	6.36	163.7	0.014	Clayey loam and calcareous	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 103 kg urea, 86 kg DAP and 36kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	Fathepur	0.1	8.6	0.35	11.35	170.6	0.016	Clayey	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 207 kg urea, 69 kg DAP and 63 kg SOP
Rajampur	Fazilpur	0.95	8	0.31	8.22	143	0.014	Clayey	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 1/3 of 104 kg urea at sowing time, 1/3 at 2nd irrigation and 1/3 at flowering stage. while 80 kg DAP and 17 kg SOP at sowing time.
Rajampur	Jahmpur	0.12	7.52	0.35	10.25	168	0.016	Clay loam	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure and gypsum into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 1/3 of 107 kg urea at sowing time, 1/3 at 2nd irrigation and 1/3 at flowering stage. while 74 kg DAP and 25 kg SOP at sowing time.

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Rajampur	KotlaNaseer	0.57	7.81	0.33	9.12	167.7	0.015	Sandy loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 1/3 of 106 kg ureaat sowing time, 1/3 at 2nd irrigation and 1/3 at flowering stage, 75 kg DAP and 16 kg SO 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	Murghai	0.48	7.81	0.33	8.5	160.7	0.015	Sandy loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 1/3 of 110 kg urea at sowing time, 1/3 at 2nd irrigation and 1/3 at flowering stage, 72 kg DAP and 22 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	Noor Pur MachiWala	0.56	8.16	0.36	6.92	142.9	0.01	Clay loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 1/3 of 100 kg urea at sowing time, 1/3 at 2nd irrigation and 1/3 at flowering stage, 84 kg DAP and 18 kg SO 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	NosheraSharq	0.75	8.01	0.31	7.01	159.5	0.014	Sandy	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 1/3 of 102 kg urea at sowing time, 1/3 at 2nd irrigation and 1/3 at flowering stage, 83 kg DAP and 10kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajampur	Malik Machi	0.86	7.85	0.411	9.46	145.6	0.019	Clay loam	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 100 kg urea, 77 kg DAP and 16 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Rajanpur	Peer BakhshSharqi	0.81	8.08	0.3	6.6	155.8	0.014	Loamy	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 107 kg urea, 72 kg DAP and 22kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajanpur	RakhKotMithan	0.729	7.92	0.33	8.04	152.9	0.015	Sandy loam	<ol style="list-style-type: none"> 1. Need to incorporate farm yard manure into soil and irrigate with good quality water and leave for three weeks. After filed capacity prepare for sowing 2. Need to add 103 kg urea, 81 kg DAP and 13kg SOP It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajanpur	Sabzani	0.634	7.97	0.34	8.07	155.6	0.016	Sandy clay loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 103 kg urea, 86 kg DAP and 36 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajanpur	Sahanwala	0.383	8.09	0.31	5.25	152.4	0.014	Sandy	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 110 kg urea, 82 kg DAP and 16 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rajanpur	Shikar Pur	0.801	7.67	0.31	6.27	158.6	0.014	Sandy loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 103 kg urea, 86 kg DAP and 36 kg SOP 3. It's better to use bio-stimulants spray on vegetative stage and flowering stage.

Tehsil	Union Councils	EC dS/m	pH	OM	A.P	A.K	T.N	Soil Type	Localized and Site Specific Recommendations
Rojhan	Bangla Hidayat	0.11	8.1	0.32	8.84	148.75	0.015	Clayey loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 104 kg urea, 79 kg DAP and 15kg SOP It's better to use bio-stimulants spray on vegetative stage and flowering stage.
Rojhan	Gimal	0.48	7.97	0.34	7.55	169	0.016	Loamy	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 102 kg urea, 82 kg DAP and 15 kg SOP It's better to use bio-stimulants spray on vegetative stage and flowering stage
Rojhan	Meeran Pur	0.97	8.02	0.38	8.22	149.17	0.017	Loamy	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 101 kg urea, 80 kg DAP and 14kg SOP It's better to use bio-stimulants spray on vegetative stage and flowering stage
Rojhan	Sabzani	0.64	7.97	0.34	8.07	155.6	0.016	Sandy clay loam	<ol style="list-style-type: none"> 1. Need to incorporate green manure and farmyard manure 2. Need to add 103 kg urea, 81 kg DAP and 12kg SOP It's better to use bio-stimulants spray on vegetative stage and flowering stage
Rojhan	Umar Kot	0.813	7.91	0.31	7.91	147	0.014	Clayey loam	<ol style="list-style-type: none"> 1. Need to incorporate Gypsum, green manure and farmyard manure 2. Need to add 107 kg urea, 76 kg DAP and 24kg SOP It's better to use bio-stimulants spray on vegetative stage and flowering stage

Final Recommendation and suggestions to ensuring soil health

- As per above findings, there are some key suggestions/ recommendation which needs to be addressed for fruitful results and ensuring the soil health and food security.
 - Improved irrigation systems, organic farming, and conservation tillage have the potential to enhance soil productivity. An awareness campaign at the district level can help and educate farmers about farming practices.
 - Pay more attention for the utilization of organic fertilizers instead of excessive use of chemical fertilizer.
 - Needs to educate and provide capacity building of the farmers for the preparation of local organic soil amendments (compost, vermi-compost and bio-stimulants from plant extracts).
 - Proper utilization of organic waste into valuable organic fertilizer (compost and vermicompost).
 - Gypsum and farm yard manure should be mixed before soil preparation and then irrigate with good quality water. Then soil should be ploughed with chisel plough and then mix organic soil amendments.
 - Needs to add organic amendments (compost, vermicompost) which will promote soil organic matter and sequester carbon from atmosphere and enhance nutrients mobility in soil.
 - Needs to use/spray plant extracts (biostmulants) in various concentration on plants foliage, to avoid pesticide residual effect on soil health.
- Need to ensure implementing of 4R technique for equitable use of fertilizer.



SWRDO Introduction

Sangtani Woman Rural Development Organization (SWRDO) is a non-profit non-religious and non-political organization. Which works only for human welfare and development without discrimination for the sustainable development of the people in different parts of Pakistan and in general in South Punjab and District Rajanpur through a peaceful environment. This institution is Certified by Pakistan Centre for philanthropists (PCP). Transparency and accountability are always kept in mind, besides this institution has signed an MOU with the Economic Affairs Division (EAD) to work across Punjab. Since its inception, Human Rights Advocacy has been striving to raise awareness and promote access to basic amenities such as education, health, clean drinking water, skill development projects, a clean environment, and free legal aid, livelihood, and disaster response services such as emergency relief and rehabilitation activities. In addition, the Sangtani Organization is working with small farmers in rural areas, especially women farmers. The main objective of Sangtani Women Rural Development Organization is to promote sustainable development through agriculture and improve the quality of life of small farmers and poor people. Sangtani Women Rural Development Organization strongly believes that women's participation and action open up new avenues for sustainable development. SWRDO is striving for capacity building of rural areas on climate change adaptation, mitigation & gender inclusion to cope with climate change impacts.