



Government of the Union of Myanmar
Ministry of Forestry
Forest Department
Forest Research Institute



**The Properties and Utilization of Soils in the Greening
Project for the Nine Critical Districts of the Arid Zone of
Central Myanmar (Part 1)**

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အပူပိုင်းဒေသ(၉)ခရိုင်စိုက်ခင်းမြေများ၏ ဂုဏ်သတ္တိများနှင့် အသုံးချမှုကို စူးစမ်းလေ့လာခြင်း (ပထမပိုင်း)

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သုတေသနလက်ထောက်

သစ်တောသုတေသနဌာနခွဲ

စာတမ်းအကျဉ်းချုပ်

အပူပိုင်းဒေသ(၉)ခရိုင်တွင် တည်ထောင်လျက်ရှိသော သစ်တောစိုက်ခင်းများ၏ မြေအမျိုးအစား ခွဲခြားရန်အတွက် ပဏာမစူးစမ်းလေ့လာမှုအဖြစ် စိုက်ခင်းမြေများ၏ ဓါတုနှင့်ရူပဂုဏ်သတ္တိများအား ခွဲခြမ်းစိတ်ဖြာခဲ့ပါသည်။ ၎င်းအပြင် အပူပိုင်းဒေသများ၌ သစ်တောစိုက်ခင်းများ တည်ထောင်ရာတွင် အထောက်အကူပြုနိုင်ရန် စိုက်ခင်းမြေများ၏ ဂုဏ်သတ္တိများနှင့်ဆက်နွယ်မှုများကို ကွင်းဆင်းလေ့လာ တွေ့ရှိချက်အပေါ်တွင် အခြေခံ၍ အကြံပြု ဆွေးနွေးထားပါသည်။

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Abstract

The physical and chemical properties of plantation soils from the Greening Project for the Nine Critical Districts of the Arid Zone of Central Myanmar were analysed as a preliminary study for soil classification. Moreover, factors relating to soils were highlighted by field observations aiming to assist the establishment of forest plantations in the Central Dryzone of Myanmar.

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1. Introduction

Dryzone soils are poor and degraded as the area has very limited precipitation and high evaporation rate. Large population (11.13 millions) is concentrated in this rainshadow area and it has serious shortage of fuelwood. In order to find out sustainable systems for fuelwood production and environmental stability, the government of Myanmar had launched The Greening Project for the Nine Critical Districts of the Arid Zone of Central Myanmar in 1993 as a national task. In addition, The Community Multipurpose Fuelwood Woodlots Project was initiated with the assistance of UNDP/FAO and the Ministry of Forestry for a duration of two years (1993-1995). As a result, extensive areas of forest plantations have been developed in 42 townships of the Central Dryzone Area.

In line with this strategy, Forest Research Institute has taken part in this project by providing technical assistance for the analysis of soil and to determine species-site matching in the project area. As a matter of fact, this preliminary study is one of the effort to address the issue of finding some clues for the successful establishment of forestation in the Central Dryzone of Myanmar.

2. Study Area

Young forest plantations 1994 of the Greening Project for the Nine Critical Districts for the Arid Zone of Central Myanmar including Sagaing Division, Mandalay Division and Magway Division were selected for this study. However, due to time constraint, the study was undertaken to cover Sagaing and Mandalay Division only. The study area is shown in table 1.

3. Materials and Methods

(a) Field Study

The selections of sites were at random in each township from 5 forest districts in collaborating with the territorial forest officers.

Soil sampling was made by collecting equal size cores from 4 to 5 locations within a uniform block of land at 0-10 cm, 20-40 cm, 40-60 cm, 60-80 cm, 80-100 cm depth using a spade or auger.

(b) Laboratory Analysis

Soil samples were air-dried, ground and sieved through a 2 mm sieve, and the physical and chemical properties were analysed by the chemists.

Particle size distribution was carried out by mechanical analysis by using the hydrometer method.

Organic matter was detected by using the weight loss on ignition method.

Soil reaction (p^H) was determined by using JENWAY p^H meter model 3020.

Total nitrogen levels were settled by Kjeldahl's method by using Labconco Macro Kjeldahl digestion and distillation unit.

Available phosphorus levels were resolved with double-acid extracting solution and molybdenum blue complex method by using Spectrophotometer U.V model 55B.

Available potassium, sodium, calcium and magnesium were assessed with double-acid extracting solution by using Perkin Elmer, Atomic Absorption Spectrophotometer, model 2280.

Electrical conductivity (E.C) and Iron concentration levels were not able to be analysed for this study.

4. Results

Some physical and chemical properties of soil samples and soil profiles from the plantations of (19) townships are presented in Appendix I and Appendix II.

The results show that most of the plantation soils are associated with active alkalinity, except in Yinmarbin and Tatkon Township.

It is found that the organic matter content of the majority areas varies from 1 to 4% which can produce a reasonably satisfactory growth (1). However, Kyaukku (Nyaung Oo), Ohnpin Dahat (Tatkon), and Maeaungkan (Yamethin) have little organic matter content left for satisfactory plant growth.

Total nitrogen content in all of the areas is lower than that of the minimum requirement of 0.07%.

The minimum requirement of phosphorus concentration levels for normal growth is 0.005% (2). However phosphorus concentration levels are very low in all areas.

The soil analysis shows that except in Meiktila, Kuaukpadaung, Mahlaing, Nyaung Oo and Tatkon (Yayzin) Townships, the potassium concentration levels are lower than that of normal forest soils.

The secondary nutrients such as sodium, calcium, magnesium are generally normal in this study.

As the texture of the study area is dominated by sandy loam, most of the area has very limited moisture contents.

5. Discussion

The major soil textures in most of the study area are sandy loam and loamy sand. Due to the intense rain and poor water holding capacity, these soil are unable to retain the moisture and maintain the nutrients.

Except *Eucalyptus camaldulensis*, most of the tree planted in the study area are nitrogen fixation species. Mezali (*Cassia siamea*), Bawsakaing (*Leucaena leucocephala*), Kokko (*Albizia lebbek*) and Acacia Spp:are generally suitable species for dry zone area.

More than 50% of the project area was planted with *Eucalyptus camaldulensis* which is suitable to improve the alkaline soils. Moreover, it has special qualities such as hardiness, durability, fast growth and high coppicing power. However, in some area like Nattaka (Yamethin) even the roots of *Eucalyptus camaldulensis* could not penetrate the clay pan and the survival is very doubtful.

According to the field observation in Chayyardaw, which is the best plantation in the Greening Project for the Nine Critical Districts of the Arid Zone of Central Myanmar, the properties of soil are still poor. Moisture content is very limited and the roots cannot penetrate more than 70 cm because of sand stone layers. It is very much doubtful for future survival and growth.

On the other hand, Shwekyin plantation in Kyaukpadaung Township which is the second prize winner, has suitable soil texture and high organic matter content for the tree

growth. Moreover, the calcium concentration level is higher than that of the minimum requirement for Eucalypt so that the future survival and growth would be guaranteed.

The third prize winner, Minphayakan plantation in Thazi Township also has soil associated with fine texture and high moisture content as well. Although the nitrogen concentration level in the soil is still low for the normal tree growth, the selection of nitrogen fixation species could be made an improvement in the future.

6. Conclusion

- (1) It is concluded that nitrogen deficiency in the study area should be overcome by establishing nitrogen fixation species. If *Eucalyptus camaldulensis* is to be selected, the site should be associated with certain level of calcium concentration. Moreover, thornless Gandasein (*Prosopis alba*) should be considered to substitute *Prosopis juliflora* in some hilly eroded areas.
- (2) Phosphorous deficiency should be improved by applying phosphate fertilizers such as DSP (Double Superphosphate) or TSP (Triple Superphosphate) and DAP (Diammonium Phosphate). However, requirements vary with species, age of trees and site conditions.
- (3) Reforestation programme should be evaluated so as to have proper sites for plantation establishment for best survival and growth of trees. Obvious examples were observed in Htisaung, Kanni and Taungkoelon where soil reaction exceeded the maximum limit (p^H 10) for minimum growth. S.A. (Sulphate of Ammonia) application should be provided on such alkaline soils.
- (4) Soil classification programme the respect to reforestation at the national level is urgently needed. Soil characteristics including soil depth, porosity, soil profile characteristics, slope, aspect, topographic position, soil moisture, geomorphology, density of native vegetation, humus layer, forest environments, etc. should be investigated and utilized in the classification scheme. The responsibility should be borne by the Forest Department while Forest Research Institute with provide technical assistance for the classification of forest soils.

Map Showing Area of Greening Project for the Nine Critical Districts of the Arid Zone of Central Myanmar

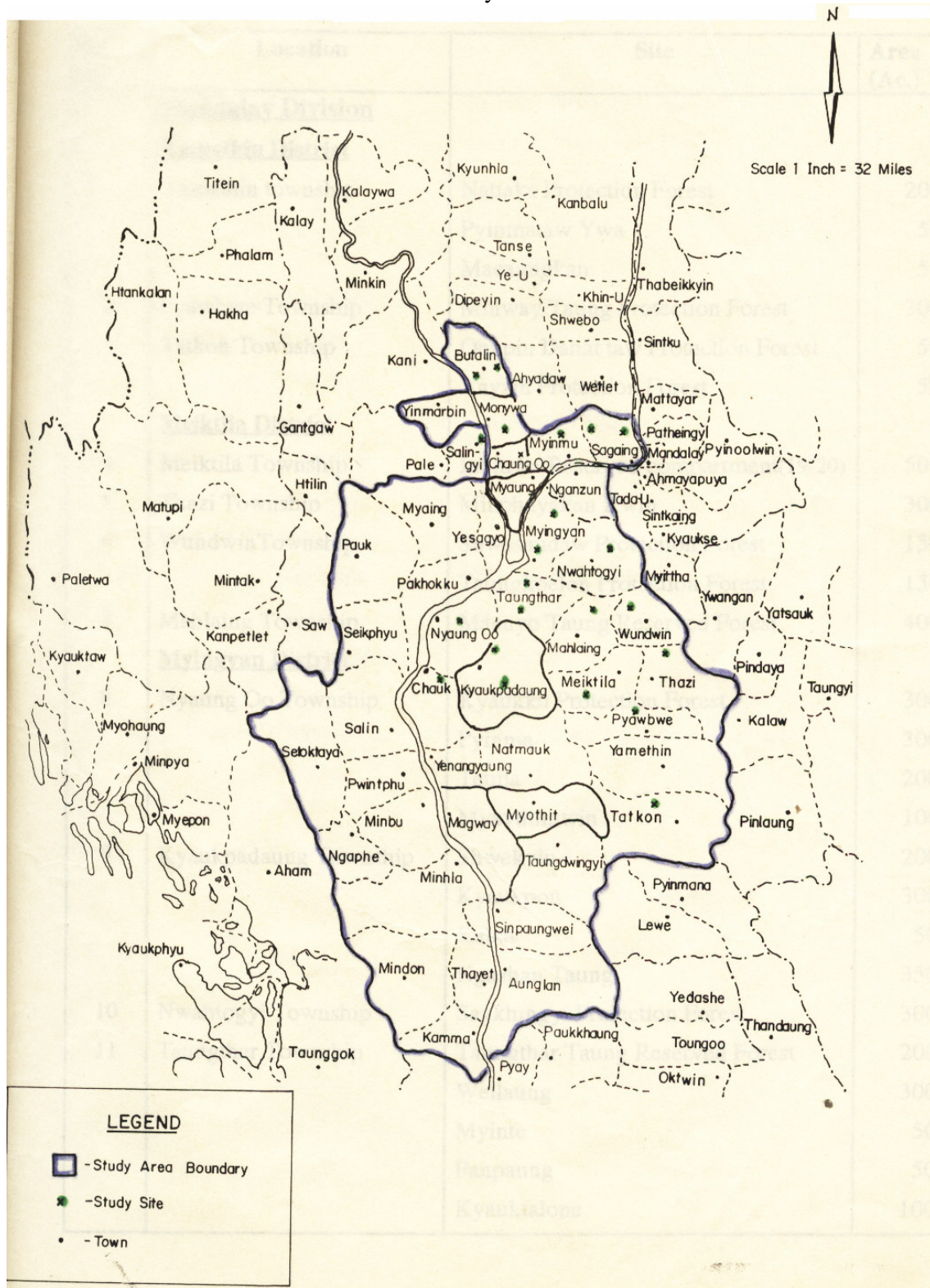


Table I . Study Area

Sr.No	Location	Site	Area (Ac.)
Mandalay Division Yamethin District			
1.	Yamethin Township	Nattaka Protection Forest Pyinmataw Ywa Maeaungkan	200 50 50
2.	Pyawbwe Township	Minway Taung Protection Forest	300
3.	Tatkon Township	Ohnpin Dahat Taw Protection Forest Yayzin Protection Forest	50 50
Meiktila District			
4.	Meiktila Township	Inbinwa Reserved Compartment (19-20)	500
5.	Thazi Township	Minphayakan Kwin	300
6.	Wundwin Township	Shwesandaw Protection Forest Taungkoelon Protection Forest	150 150
7.	Mahlaing Township	Maenyo Taung Reserved Forest	400
Myingyan District			
8.	Nyaung Oo Township	Kyaukku Protection Forest Pyinma Tetma Myaythintwin	300 300 200 100
9.	Kyaukpadaung Township	Shwekyin Kyaukpon Kabat Ngashan Taung	200 300 50 350
10.	Nwahtogyi Township	Saykhingyi Protection Forest	300
11.	Taungthar Township	Taungthar Taung Reserved Forest Weilaung Myinte Panpaung Kyauktalone	200 300 50 50 100

Sr.No	Location	Site	Area (Ac.)
12.	Myingyan Township	Kanni Protection Forest Kokke Protection Forest Yondoe Sakha Teywa	300 300 100 183 17
	Sagaing Division		
13.	Sagaing District Sagaing Township	Chayyardaw Minwun Taung	450 50
14.	Nganzun Township	Road Side Plantation	50
15.	Myinmu Township	Htisoung	100
	Monywa District		
16.	Monywa Township	Kyaukpyin Taung Bansi	197 203
17.	Chaung Oo Township	Nwekway Yayposa Pond	500 100
18.	Butalin Township	Twin Taung Road Side Plantation Winbo Okpho Taung	48 132 320
19.	Yinmarbin Township	Salin/Sakha	200



Plate 1.a. 1994 Fuelwood Plantation with *Eucalyptus camaldulensis*
Ohnbin, Takone.

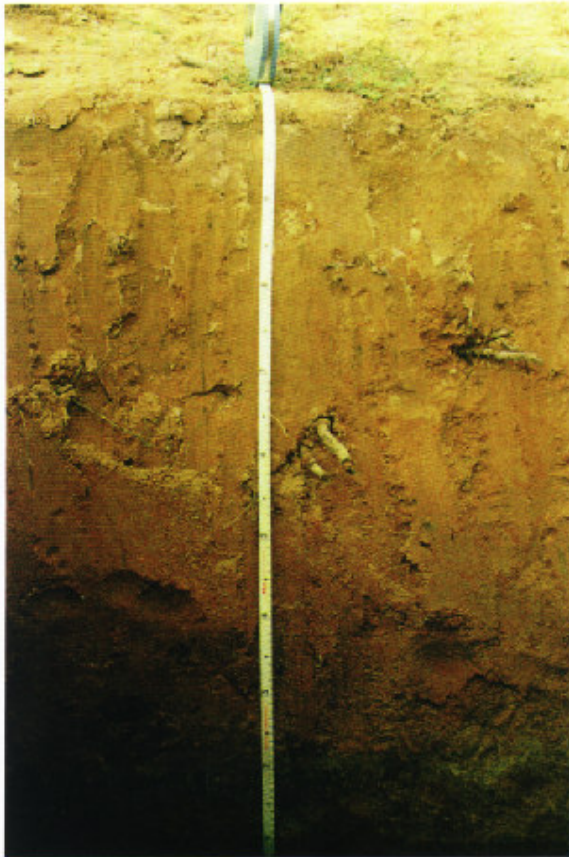


Plate 1.b.
Soil Profile
Sandy Loam in A1,
Loamy Sand in A and
Sandy Clay Loam in B horizon.
Light yellowish brown in A1
and reddish yellow in A and B



Plate 2a. 1994; Fuelwood Plantation with *Leucaena leucocephala*
Shwe-san-daw, Wundwin

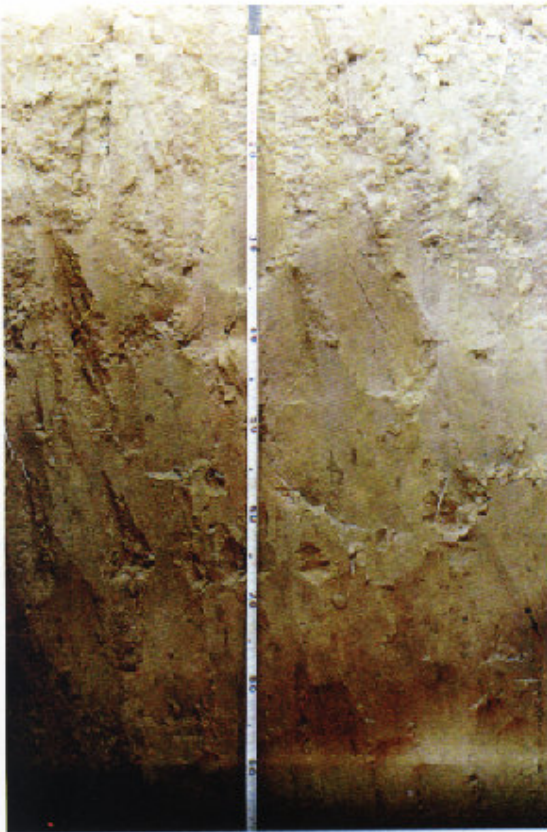


Plate 2.b.
Soil Profile
Sandy Loam in A horizon
pale yellow.



Plate 3a. 1994 Fuelwood Plantation with *Eucalyptus camaldulensis* Kyauk-ku, Nyaungoo.



Plate 3.b.
Soil Profile.
Sandy Clay Loam in A, B and C. Very pale brown in A and C. Brownish yellow in B and C horizon.



Plate 4a. 1994 Fuelwood Plantation with *Acacia senegal* Hti Saung, Myinmu.



Plate 4.b.
Soil Profile.
Sandy Clay Loam in A and B1
and Clay in B horizon dark gray
in A, light gray in B1 and very
pale brown in B horizon



Plate 5a. 1994 *Eucalyptus camaldulensis* plantation Twintaung, Budalin.



Plate 5.b.
Soil Profile.
Sandy Clay Loam in A, B and C.
Light brownish gray in A and
light gray in B and C horizon.

Appendix I

Physical and Chemical Properties of Soil Profile in Yamethin District

Description	Horizon	p ^H	Total N%	Extractable Nutrients					OM %	Texture			
				P %	K%	Na %	Ca %	Mg %		Sand %	Silt %	Clay %	
Nattaka	Ao	8.13	0.0204	0.000213	0.0021	0.0045	0.0640	0.0160	3.44	40	20	36	Clay Loam
Yamethin	A	8.21	0.0210	0.001030	0.0058	0.0028	0.1590	0.0250	2.85	35	26	36	Clay Loam
Pyinmadaw Yamathin	Ao	4.80	0.0212	0.000127	0.0045	0.0037	0.0025	0.0049	1.42	40	40	15	Loam
	A	5.13	0.0219	0.000109	0.0015	0.0088	0.0014	0.0050	1.79	34	40	24	Loam
	B	4.82	0.0212	0.000314	0.0015	0.0350	0.0069	0.0134	3.47	61	14	20	Sandy Clay Loam
Meiaungkan Yamethin	A	9.44	0.0212	0.000096	0.0018	0.0350	0.1350	0.0420	1.51	67	12	16	Sandy Loam
	B	5.48	0.0219	0.000117	0.0041	0.0270	0.0300	0.0150	1.46	67	12	16	Sandy Loam
	C	10.00	0.0205	0.000102	0.0026	0.0480	0.0900	0.0380	1.40	56	16	24	Sandy Clay Loam
Ohmpin Dahat Tatkon	Ao	3.03	0.0191	0.000233	0.0021	0.0128	0.0260	0.0060	0.65	85	6	7	Loamy Sand
	A	4.67	0.0208	0.000152	0.0042	0.0290	0.0290	0.0110	1.14	71	12	13	Sandy Loam
	B	4.70	0.0169	0.000112	0.0061	0.0290	0.0022	0.0110	0.90	60	6	31	Sandy Clay Loam
Yayzin Tatkon	A	5.33	0.0219	0.000967	0.0032	0.0013	0.0112	0.0130	1.76	83	8	6	Loamy Sand
	B	5.34	0.0141	0.000187	0.0031	0.0014	0.0073	0.0039	1.10	89	2	7	Loamy Sand
	C	5.66	0.0212	0.000405	0.0016	0.0014	0.0019	0.0029	0.38	82	8	7	Loamy Sand
Minway Pyawbwe	Ao	8.95	0.0235	0.000116	0.0026	0.0127	0.1180	0.0440	1.14	67	10	18	Sandy Loam
	A	9.05	0.0184	0.000076	0.0027	0.0121	0.1500	0.0580	2.15	70	10	16	Sandy Loam
	B	9.26	0.0205	0.000085	0.0024	0.0125	0.0890	0.0105	1.28	71	10	16	Sandy Loam

Physical and Chemical Properties of Soil Profile in Meiktila District

Description	Horizon	p ^H	Total N%	Extractable Nutrients					OM %	Texture			Remark
				Ava. P %	K%	Na %	Ca %	Mg %		Sand %	Silt %	Clay %	
Inbinwa	A	8.30	0.0177	0.000098	0.0122	0.0049	0.2620	0.0340	3.19	65	6	27	Sandy Clay Loam
Meiktila	B	9.03	0.0219	0.000893	0.0127	0.0261	0.3100	0.0440	2.43	83	4	7	Loamy Sand
Meaenyo	A	8.26	0.0366	0.000290	0.0183	0.0203	0.3540	0.0270	2.81	67	22	9	Sandy Loam
Mahlaing	B	10.12	0.0282	0.000097	0.0170	0.2700	0.2270	0.0930	2.72	27	54	15	Silt Loam
Taungkoelon	A	9.33	0.0205	0.000189	0.0019	0.0329	0.0120	0.0400	2.63	55	16	25	Sandy Clay Loam
Wundwin	B	9.70	0.0247	0.000194	0.0012	0.1850	0.0590	0.0570	2.77	32	20	45	Clay
	C	9.40	0.0191	0.000342	0.0019	0.1910	0.0130	0.0520	3.37	30	20	45	Clay
Shwesandaw	A	7.66	0.0185	0.000493	0.0023	0.0057	0.0130	0.0600	0.95	72	12	11	Sandy Loam
Wundwin													
Minphayakan	A	8.51	0.0240	0.000535	0.0020	0.0128	0.0400	0.0220	2.41	67	10	19	Sandy Loam
Thazi	B	9.54	0.0219	0.000343	0.0017	0.0690	0.0350	0.0340	1.62	66	10	21	Sandy Clay Loam
	C	8.75	0.0240	0.000544	0.0016	0.0057	0.0420	0.0210	2.15	68	10	19	Sandy Loam

Physical and Chemical Properties of Soil Profile in Myingyan District

Description	Horizon	p ^H	Total N%	Extractable Nutrients					OM%	Texture			Remark
				Ava.P %	K%	Na %	Ca %	Mg %		Sand %	Silt %	Clay %	
Kanni Myingyan	A1	7.95	0.0297	0.001400	0.0043	0.0109	0.1110	0.0480	2.29	60	20	17	Sandy Loam
	A	8.00	0.0240	0.001080	0.0018	0.0127	0.1320	0.0450	2.73	67	14	15	Sandy Loam
	B	8.02	0.0219	0.000480	0.0024	0.0112	0.1270	0.0740	2.52	58	20	19	Sandy Loam
Kokke Myingyan	A	8.07	0.0438	0.000062	0.0033	0.0025	0.2180	0.0120	2.02	49	20	27	Sandy clay Loam
	B	9.53	0.0233	0.001740	0.0021	0.0378	0.1110	0.0630	3.14	5	45	51	Sandy Loam
	C	9.60	0.0664	0.001990	0.0018	0.0162	0.0640	0.0490	3.24	6	32	57	Sandy clay Loam
Seykhingyi Nwahtogyi	A1	9.98	0.0240	0.000070	0.0036	0.0081	0.1200	0.0300	1.96	57	18	22	Sandy clay Loam
	A	9.24	0.0261	0.000090	0.0068	0.0038	0.1400	0.0280	2.41	61	16	20	Sandy Loam
	B	9.93	0.0240	0.000065	0.0034	0.0128	0.0860	0.0430	1.56	50	16	30	Sandy clay Loam
Taungthataung Taungtha	A	9.45	0.0311	0.000092	0.0021	0.0168	0.0260	0.0100	2.04	66	14	17	Sandy Loam
	B	10.04	0.0191	0.001023	0.0017	0.1440	0.0380	0.0550	1.77	50	36	11	Loam
Kyaukpon Kyaukpadaung	A	8.53	0.0219	0.000002	0.0114	0.0015	0.4900	0.0260	3.56	64	12	20	Sandy Loam
	B	8.96	0.0155	0.000221	0.0117	0.0015	0.5000	0.0210	2.30	89	2	4	Sand
	C	8.95	0.0191	0.002650	0.0116	0.0016	0.2100	0.0190	1.60	93	2	2	Sand
Shwekyin Kuaukpadaung	A	8.66	0.0381	0.000046	0.0127	0.0010	0.4400	0.0280	3.61	30	32	34	Clay Loam
	B	8.94	0.0212	0.000018	0.0116	0.0006	0.4700	0.0300	3.46	55	16	26	Sandy clay Loam
	C	9.12	0.0212	0.000375	0.0123	0.0010	0.3770	0.0590	2.44	83	6	6	Loamy Sand
Pyinma Nyaungoo	A	8.67	0.0240	0.000019	0.0101	0.0015	0.4300	0.0510	2.23	56	20	19	Sandy Loam
	B	8.87	0.0177	Trace	0.0106	0.0024	0.4090	0.1190	3.11	75	16	6	Sandy Loam
	C	9.02	0.0198	Trace	0.0107	0.0029	0.3890	0.1320	1.59	75	18	4	Sandy Loam
Kyaukku Nyaung Oo		10.00	0.0212	Trace	0.0121	0.3940	0.1050	0.0380	1.86	51	30	16	Loam
		10.54	0.0177	Trace	0.0165	0.2760	0.1440	0.1430	1.51	50	32	14	Loam
		10.65	0.0205	Trace	0.0194	0.2220	0.1430	0.1720	0.96	60	22	12	Sandy Loam

Physical and Chemical Properties of Soil Profile in Sagaing District

Description	Horizon	p ^H	Total N%	Extractable Nutrients					OM %	Texture			
				Ava.P %	K%	Na %	Ca %	Mg %		Sand %	Silt %	Clay %	
Chayyardaw Sagaing	A	9.14	0.0244	0.000011	0.0038	0.0048	0.4200	0.0147	2.01	78	6	11	Sandy Loam
	B	9.28	0.0215	0.000080	0.0015	0.0034	0.4400	0.0409	2.69	71	8	15	Sandy Loam
	C	9.45	0.0155	0.003000	0.0019	0.0045	0.2700	0.0385	2.10	83	6	9	Loamy Sand
Minwun Sagaing	A	8.95	0.0289	0.001080	0.0101	0.0036	0.2130	0.0083	1.85	75	8	11	Sandy Loam
	B	9.01	0.0167	0.000620	0.0029	0.0033	0.2980	0.0070	1.32	79	8	11	Sandy Loam
	C	9.10	0.0182	0.000300	0.0052	0.0051	0.3900	0.0160	2.50	66	10	19	Sandy Loam
Htisoung	A	9.42	0.0105	0.000105	0.0025	0.0123	0.3760	0.0404	0.60	61	10	27	Sandy Clay Loam
Myinmu	B1	10.70	0.0194	0.000087	0.0017	0.2040	0.1570	0.0401	0.26	52	12	35	Sandy Clay Loam
	B	10.62	0.0187	0.000012	0.0015	0.2300	0.2250	0.0331	0.42	42	14	41	Clay
Nganzum	A	7.77	0.0477	0.003400	0.0121	0.0044	0.1540	0.0230	1.57	69	13	16	Sandy Loam

Physical and Chemical Properties of Soil Profile in Monywa District

Description	Horizon	p ^H	Total N%	Extractable Nutrients					OM %	Texture			
				Ava.P %	K%	Na %	Ca %	Mg %		Sand %	Silt %	Clay %	
Bansi Monywa	A	9.14	0.0247	0.000042	0.0021	0.0122	0.1680	0.0270	1.28	4	34	23	Loam
	B	9.20	0.0219	0.000043	0.0055	0.0207	0.1640	0.0460	0.77	68	14	17	Sandy Loam
	C	10.47	0.0198	0.000370	0.0033	0.0220	0.1050	0.0740	0.66	66	16	17	Sandy Loam
Nwekway Chaung Oo	A	10.00	0.0297	0.000053	0.0033	0.1030	0.1230	0.0340	1.65	34	44	17	Sandy Loam
	B	10.43	0.0205	0.000052	0.0020	0.0300	0.1360	0.0300	1.14	69	16	13	Silt Loam
	C	10.49	0.0177	0.000050	0.0040	0.1030	0.1330	0.0340	1.43	31	54	13	Sandy Loam
Yeposa Chaung Oo	A	10.00	0.0219	0.000060	0.0038	0.0395	0.0670	0.0620	2.13	71	20	7	Sandy Loam
	B	10.84	0.0191	0.000063	0.0035	0.2850	0.0380	0.0350	2.36	79	10	7	Loamy Sand
	B2	11.01	0.0522	0.000048	0.0027	0.3600	0.0090	0.0360	2.42	78	14	7	Loamy Sand
Okpho Taung Butalin	A	8.96	0.0162	0.000052	0.0031	0.0025	0.3080	0.0330	4.43	69	6	22	Sandy Clay Loam
	B	9.39	0.0169	0.000050	0.0021	0.0078	0.2750	0.0590	1.46	78	8	9	Loamy Sand
	B2	9.40	0.0452	0.000064	0.0020	0.0151	0.1860	0.0720	1.03	85	8	5	Loamy Sand
Twin Taung Butalin	A	8.34	0.0212	0.000007	0.0016	0.0148	0.3600	0.0210	3.62	51	30	17	Loam
	B	8.62	0.0177	Trace	0.0022	0.0144	0.3520	0.0160	1.73	58	26	13	Sandy Loam
	C	8.69	0.0085	0.000004	0.0019	0.0012	0.3860	0.0210	1.86	66	22	9	Sandy Loam
Salingyi Yinmarbin	A	8.05	0.0124	0.000008	0.0025	0.0010	0.4060	0.0110	6.19	41	32	23	Loam
	B	8.31	0.0212	0.000159	0.0032	0.0018	1.4900	0.0150	4.19	85	6	5	Loamy Sand
	C	8.33	0.0515	0.000032	0.0017	0.0011	0.2340	0.0400	5.06	39	30	28	Clay Loam

Appendix II

Physical and Chemical Properties of Soil in Nattaka, Yamethin Township

Depth(cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava.P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.04	0.0211	0.000590	0.0077	0.0290	0.2910	0.0151	1.53	23	42	20
20-40	8.03	0.0120	0.000073	0.0042	0.0240	0.3100	0.0258	1.66	42	26	28
40-60	7.96	0.0070	0.000064	0.0054	0.0030	0.3770	0.0140	1.72	41	22	34
60-80	7.95	Trace	0.000054	0.0070	0.0042	0.3770	0.0150	2.08	41	20	32
80-100	8.01	0.0420	0.000053	0.0038	0.0044	3.8200	0.0145	1.93	46	26	24
0-10	7.69	0.0140	0.000277	0.0101	0.0020	1.5500	0.0311	2.44	44	24	28
20-40	8.11	0.0140	0.000155	0.0065	0.0034	2.0500	0.0390	2.03	40	24	32
40-60	8.08	0.0140	0.000141	0.0070	0.0023	0.2040	0.0550	2.12	44	24	28
60-80	8.13	0.0140	0.000137	0.0073	0.0045	0.1600	0.0540	1.87	42	24	30
80-100	8.23	0.0560	0.000210	0.0077	0.0063	0.1330	0.0530	1.77	41	24	28
0-10	8.14	0.0250	0.000700	0.0050	0.0028	0.3240	0.0092	2.08			
20-40	8.27	0.0140	0.000051	0.0044	0.0029	0.0390	0.0122	1.92	51	20	26
40-60	8.36	0.0280	0.000062	0.0042	0.0031	1.9500	0.0144	2.16	52	20	24
60-80	8.46	0.0180	0.000063	0.0032	0.0041	2.9200	0.0156	2.17	63	18	15
80-100	8.55	0.0140	0.000058	0.0033	0.0044	2.6000	0.0147	2.19	66	12	17

Physical and Chemical Properties of Soil in Pyinmataw, Yamethin Township

Depth cm	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	9.28	0.0180	0.000507	0.0052	0.0980	0.1330	0.0297	1.99	57	12	27
20-40	5.54	0.0180	0.000031	0.0027	0.1320	0.2600	0.0373	2.29	56	12	27
40-60	9.60	0.0140	0.000028	0.0020	0.1350	0.2940	0.0395	2.44	60	12	23
60-80	9.53	0.0210	0.000063	0.0024	0.1250	0.2580	0.0374	0.50	59	12	23
80-100	9.48	0.0810	0.000052	0.0021	0.1250	0.2720	0.0375	0.65	31	10	55
0-10	6.68	0.0190	0.000168	0.0024	0.0053	0.0540	0.0039	0.69	69	10	18
20-40	5.80	0.0140	0.000075	0.0011	0.0057	0.0380	0.0033	0.22	77	10	6
40-60	3.92	0.0370	0.000059	0.0017	0.0840	0.0320	0.0102	3.14	81	12	4
60-80	3.76	0.0190	0.000203	0.0025	0.0810	0.0290	0.0105	2.83	37	12	46
80-100	3.80	0.0290	0.000098	0.0020	0.0850	0.0310	0.0098	2.53	60	12	22
0-10	3.45	0.0190	0.000092	0.0015	0.0061	0.0330	0.0041	0.79	54	34	8
20-40	4.38	0.0170	0.000058	0.0017	0.0094	0.0320	0.0044	0.86	65	18	14
40-60	4.62	0.0210	0.000096	0.0088	0.0271	0.1730	0.0046	2.45	79	4	12
60-80		0.0190	0.000142	0.0054	0.0216	0.4800	0.0059	2.24	78	8	11
80-100	4.00	0.0340	0.000163	0.0021	0.0299	0.0310	0.0079	2.11	42	20	36
0-10	6.22	0.0120	0.000172	0.0012	0.0027	0.0280	0.0030	1.15	89	6	1
20-40	9.64	0.0240	0.000136	0.0010	0.0850	0.0670	0.0162	0.67	76	4	16
40-60	9.69	0.0210	0.000352	0.0018	0.1060	0.0530	0.0144	0.65	95	4	12
60-80	9.66	0.0170	0.000403	0.0017	0.0860	0.0590	0.0121	0.07	82	4	10
80-100	9.60	0.0150	0.000077	0.0030	0.0960	0.0390	0.0109	0.15	82	10	6

Physical and Chemical Properties of Soil in Maeungkan, Yamethin Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava.P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	9.86	0.0140	0.000147	0.0044	0.0780	0.0410	0.0249	1.01	65	8	24
20-40	9.87	0.0140	0.000121	0.0043	0.0840	0.0283	0.0178	0.57	73	8	16
40-60	5.65	0.0140	0.000105	0.0028	0.0880	0.0550	0.0279	0.73	60	16	20
60-80	5.94	0.0210	0.000158	0.0056	0.0820	0.0530	0.0276	1.37	64	12	20
80-100	6.15	0.0250	0.000110	0.0038	0.0770	0.0510	0.0259	0.77	46	16	22
0-10	6.24	0.0140	0.000075	0.0038	0.0250	0.3990	0.0242	3.00	64	16	16
20-40	6.55	0.0140	0.000093	0.0017	0.0480	0.3200	0.0400	0.99	48	20	26
40-60	9.15	0.0140	0.000075	0.0033	0.0580	0.3580	0.0440	0.46	50	18	26
60-80	9.52	0.0250	0.000095	0.0044	0.1550	0.2820	0.0480	0.87	61	12	22
80-100	9.50	0.0210	0.000112	0.0048	0.1400	0.2190	0.0400	0.66	53	22	20
0-10	9.95	0.0140	0.000254	0.0050	0.0040	0.0300	0.0052	0.83	83	10	2
20-40	10.00	0.0180	0.000184	0.0022	0.0580	0.0151	0.0094	0.73	72	14	10
40-60	5.46	0.0080	0.000226	0.0028	0.1240	0.0260	0.0212	0.63	66	10	20
60-80	6.25	0.0080	0.000102	0.0027	0.1600	0.3050	0.0420	1.44	60	12	24
80-100	6.70	0.0190	0.000213	0.0064	0.1590	0.1140	0.0340	1.29	50	14	22
0-10	10.00	0.0180	0.000188	0.0038	0.0390	0.0259	0.0033	1.25	92	4	1
20-40	10.00	0.0330	0.000137	0.0046	0.1150	0.2630	0.0226	0.73	50	20	16
40-60	6.79	0.0280	0.000281	0.0028	0.1170	0.2520	0.0223	1.31	70	10	16
60-80	10.01	0.0490	0.000120	0.0029	0.0116	0.1290	0.0179	0.54	70	10	16
80-100	10.18	0.0320	0.000098	0.0034	0.1040	0.2300	0.0257	0.43	72	10	14

Physical and Chemical Properties of Soil in Minway Taung , Pyawbwe Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	5.03	0.0190	0.004260	0.0106	0.0700	0.0174	0.0348	2.55	70	10	16
20-40	9.90	0.0140	0.000179	0.0093	0.1530	0.0194	0.0385	1.91	49	4	42
40-60	10.03	0.0190	0.003240	0.0114	0.1940	0.1800	0.0398	2.23	50	4	42
60-80	10.09	0.0180	0.003280	0.0093	0.2490	0.1190	0.3820	2.76	42	20	35
80-100	10.20	0.0180	0.000262	0.0091	0.3020	0.1200	0.0309	0.41	41	20	35
0-10	9.48	0.0180	0.000149	0.0061	0.0050	0.3860	0.0401	1.91	50	12	33
20-40	8.16	0.0140	0.000229	0.0085	0.0037	0.0298	0.0610	1.29	75	8	13
40-60	8.39	0.0110	0.000189	0.0097	0.0039	0.2870	0.0700	2.69	79	4	11
60-80	8.40	0.0110	0.000092	0.0085	0.0049	0.2220	0.1100	1.17	80	4	11
80-100	8.62	0.0360	0.000158	0.0092	0.0027	0.3930	0.0370	0.71	80	4	11
0-10	8.24	0.0130	0.000136	0.0101	0.0037	0.3860	0.0396	3.47	74	8	13
20-40	9.88	0.0070	0.000490	0.0101	0.1500	0.0860	0.0440	2.77	44	14	39
40-60	9.84	0.0110	0.000307	0.0084	0.1460	0.0930	0.0460	2.62	43	14	37
60-80	9.88	0.0130	0.000191	0.0053	0.1530	0.1530	0.0510	3.20	36	16	44
80-100	9.86	0.0120	0.000409	0.0057	0.1569	0.1360	0.0202	1.29	36	14	46
0-10	10.11	0.0170	0.000285	0.0085	0.1020	0.3550	0.0170	1.14	69	12	16
20-40	9.53	0.0120	0.002710	0.0076	0.0520	0.4320	0.0240	2.37	75	12	10
40-60	10.23	0.0110	0.000299	0.0052	0.1440	0.2540	0.0228	2.37	60	16	20
60-80	10.15	0.0110	0.000164	0.0031	0.2520	0.1560	0.0234	0.72	51	18	28
80-100	10.19	0.0220	0.000203	0.0029	0.2880	0.1230	0.0220	0.79	49	16	30
0-10	7.56	0.0370	0.000340	0.0062	0.0043	0.0840	0.0261	1.10	76	10	8
20-40	7.15	0.0290	0.000151	0.0047	0.0036	0.0164	0.0450	0.18	41	26	28
40-60	7.22	0.0320	0.000135	0.0057	0.0041	0.0147	0.0450	0.06	36	26	32
60-80	7.28	0.0100	0.000169	0.0052	0.0042	0.0153	0.0470	0.80	46	20	28
80-100			0.000137	0.0048	0.0057	0.0146	0.0470	2.83	36	28	32

Physical and Chemical Properties of Soil in Ohnpin Dahat, Tatkon Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	5.13	0.0200	0.000220	0.0021	0.0011	0.0133	0.0022	0.63	79	4	13
20-40	4.58	0.0110	0.000148	0.0024	0.0008	0.0096	0.0015	0.37	83	6	7
40-60	5.43	0.0650	0.000080	0.0038	0.0023	0.0121	0.0025	1.00	83	6	6
60-80	5.05	0.0080	0.000078	0.0109	0.0377	0.0113	0.0026	1.63	38	30	26
80-100	5.43		0.000274	0.0077	0.2270	0.0070	0.0022	1.22	69	8	16
0-10	4.41		0.000103	0.0044	0.0026	0.0204	0.0028	0.93	72	14	6
20-40	4.72	0.0140	0.000132	0.0034	0.0056	0.0122	0.0040	0.53	72	14	20
40-60	5.22	0.0090	0.000118	0.0042	0.0066	0.0083	0.0026	0.52	74	10	10
60-80	5.32	0.0160	0.000076	0.0061	0.0089	0.0090	0.0041	1.11	70	10	14
80-100	4.90	0.0250	0.000136	0.0072	0.0240	0.0207	0.0117	2.25	54	8	32
0-10	5.14	0.0160	0.000079	0.0075	0.0139	0.0234	0.0041	0.68	79	10	6
20-40	6.05	0.0130	0.000076	0.0049	0.0173	0.0115	0.0023	0.51	82	6	6
40-60	6.15	0.0130	0.000086	0.0043	0.0112	0.0104	0.0025	0.97	80	6	8
60-80	6.25	0.0110	0.000071	0.0048	0.0107	0.0145	0.0026	0.85	80	6	8
80-100	6.19	0.0140	0.002880	0.0052	0.0233	0.0140	0.0026	1.00	77	6	12
0-10	6.08	0.0140	0.000247	0.0064	0.0048	0.0770	0.0090	2.23	69	12	14
20-40	7.86	0.0380	0.000184	0.0077	0.0065	0.1280	0.0111	2.28	63	14	16
40-60		0.0410							58	18	20
60-80	7.95	0.0320	0.000147	0.0097	0.0079	0.3180	0.0223	2.75	60	14	20
80-100	7.94	0.0280	0.000252	0.0045	0.0045	0.1400	0.0177	1.17	66	10	20

Physical and Chemical Properties of Soil in Yayzin, Tatkon Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	5.11	0.0130	0.000084	0.0034	0.0035	0.1080	0.0012	0.59	88	4	2
20-40	4.71	0.0110	0.000149	0.0060	0.0039	0.0133	0.0013	0.34	90	4	2
40-60	4.20	0.0110	0.000161	0.0110	0.0040	0.0190	0.0024	0.55	89	6	1
60-80	4.48	0.0110	0.000142	0.0036	0.0049	0.0242	0.0031	0.93	89	6	1
80-100	4.08	0.0210	0.000130	0.0080	0.0089	0.0160	0.0046	3.13	67	2	26
0-10	5.15	0.0140	0.000273	0.0132	0.0040	0.0270	0.0040	0.68	89	8	1
20-40	5.02	0.0150	0.000164	0.0103	0.0042	0.0249	0.0026	0.62	87	8	1
40-60	4.49	0.0140	0.000133	0.0100	0.0044	0.0358	0.0032	0.88	83	2	1
60-80	5.36	0.0190	0.000151	0.0090	0.0037	0.0180	0.0032	0.32	88	2	4
80-100	5.19	0.0250	0.000150	0.0113	0.0045	0.0540	0.0045	1.15	75	4	16
0-10	5.66	0.0290	0.000134	0.0122	0.0036	0.0450	0.0064	1.64	73	4	16
20-40	5.38	0.0150	0.000134	0.0145	0.0048	0.0530	0.0171	3.88	48	6	42
40-60	5.35	0.0160	0.000129	0.0145	0.0050	0.0810	0.0180	5.01	46	8	42
60-80	5.22	0.0140	0.000134	0.0138	0.0060	0.0700	0.0138	4.31	47	6	40
80-100	5.28	0.0420	0.000164	0.0145	0.0057	0.0600	0.0136	4.32	54	16	24

Physical and Chemical Properties of Soil in Inbinwa, Meiktila Township

Depth (cm)	pH	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.80	0.0501	0.000069	0.0106	0.0024	0.3740	0.0440	4.10	61	16	19
20-40	7.90	0.0409	0.000074	0.0131	0.0036	0.3610	0.0480	4.17	56	10	19
40-60	8.01	0.0339	0.000069	0.0135	0.0057	0.3830	0.0470	0.91	57	24	17
60-80	8.16	0.0240	0.000069	0.0117	0.0066	0.2220	0.0560	0.70	51	30	17
80-100	8.18	0.0275	0.000072	0.0136	0.0074	0.3620	0.0660	0.79	52	30	17
0-10	7.61	0.0191	0.000105	0.0144	0.0043	0.2290	0.0340	0.95	58	10	27
20-40	8.32	0.0162	0.000134	0.0141	0.0070	0.2650	0.0440	1.33	61	10	25
40-60	8.66	0.0261	0.000085	0.0136	0.0081	0.3900	0.0410	1.17	70	10	17
60-80	8.77	0.0268	0.000065	0.0059	0.0088	0.4400	0.0390	1.85	63	14	19
80-100	9.10	0.0176	0.000081	0.0055	0.0060	0.4800	0.0410	0.79	65	26	7

Physical and Chemical Properties of Soil in Minphayakan, Thazi Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.76	0.0324	0.000360	0.0031	0.0190	0.4080	0.0268	1.34	81	6	11
20-40	8.10	0.0310	0.000160	0.0027	0.0310	0.4060	0.0300	1.55	78	6	13
40-60	8.80	0.0310	0.000161	0.0048	0.0530	0.3800	0.0352	1.80	76	8	13
60-80	9.44	0.0268	0.000177	0.0029	0.0700	0.3370	0.0330	1.87	72	10	15
80-100	9.77	0.0289	0.000161	0.0028	0.0220	0.1710	0.0347	1.76	71	10	15
0-10	7.83	0.0317	0.000369	0.0040	0.0190	0.1710	0.0352	2.08	71	8	17
20-40	8.04	0.0324	0.000686	0.0031	0.0290	0.1870	0.0215	1.96	78	6	13
40-60	8.67	0.0455	0.000434	0.0031	0.0260	0.1550	0.0366	2.18	71	10	15
60-80	8.87	0.0232	0.000309	0.0035	0.0820	0.1420	0.0370	2.14	71	8	17
80-100	9.17	0.0155	0.000205	0.0042	0.0910	0.2290	0.0480	2.25	66	12	21
0-10	9.62	0.0198	0.000115	0.0048	0.1700	0.2920	0.0490	1.96	69	6	21
20-40	9.76	0.0289	0.000920	0.0049	0.1760	0.1850	0.0650	2.04	64	10	23
40-60	9.77	0.0134	0.000089	0.0058	0.1850	0.0960	0.0500	2.11	65	10	21
60-80	9.74	0.0141	0.000116	0.0078	0.1820	0.0720	0.4100	1.95	67	8	23
80-100	9.62	0.0127	0.000138	0.0041	0.0650	0.2640	0.0450	2.10	61	12	25

Physical and Chemical Properties of Soil in Shwesandaw, Wundwin Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	6.92	0.0162	0.000548	0.0040	0.0338	0.0510	0.0142	0.63	85	6	7
20-40	7.09	0.0113	0.000577	0.0057	0.0097	0.0420	0.0122	0.57	86	4	7
40-60	7.02	0.0098	0.000374	0.0030	0.0019	0.0530	0.0160	0.81	81	8	7
60-80	7.13	0.0141	0.000402	0.0033	0.0181	0.0550	0.0128	0.66	85	6	7
80-100	8.50	0.0176	0.000402	0.0028	0.0161	0.0810	0.0126	0.82	82	6	7
0-10	8.98	0.0127	0.000430	0.0065	0.0152	0.1560	0.0360	1.05	81	6	9
20-40	8.55	0.0225	0.000600	0.0060	0.0288	0.1650	0.0710	1.89	73	18	7
40-60	8.64	0.0141	0.002685	0.0113	0.0164	0.0730	0.0225	1.14	75	20	1
60-80	8.72	0.0120	0.003040	0.0049	0.0173	0.0640	0.0232	1.39	78	16	3
80-100	8.96	0.0106	0.003625	0.0047	0.1290	0.0460	0.0159	0.63	78	14	5
0-10	9.36	0.0571	0.000153	0.0036	0.0430	0.2990	0.7900	2.12	71	12	13
20-40	10.08	0.0444	0.000127	0.0026	0.1350	0.2560	0.3900	1.84	60	18	19
40-60	10.24	0.0322	0.000128	0.0023	0.1510	0.0239	0.0390	2.05	58	18	21
60-80	10.27	0.0431	0.000133	0.0026	0.0360	0.2540	0.0400	1.99	58	18	21
80-100	10.28	0.0314	0.000137	0.0035	0.1440	0.2500	0.0340	2.53	65	12	19
0-10	9.01	0.0219	0.000514	0.0031	0.2140	0.0710	0.0261	1.20	81	8	9
20-40	8.26	0.0226	0.000421	0.0035	0.1830	0.0660	0.0251	1.24	79	10	9
40-60	8.90	0.0226	0.000791	0.0035	0.1660	0.2150	0.0274	1.11	76	10	11
60-80	9.37	0.0240	0.000268	0.0030	0.2850	0.0311	0.0221	1.18	76	10	11
80-100	9.65	0.0177	0.000360	0.0040	0.0170	0.2000	0.0349	0.74	69	18	11

Physical and Chemical Properties of Soil in Taungkoelon, Wundwin Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	9.26	0.0346	0.000099	0.0036	0.1800	0.2000	0.0450	2.61	59	16	21
20-40	9.36	0.0226	0.000112	0.0066	0.2890	0.1110	0.0510	4.62	35	20	43
40-60	9.62	0.0279	0.000162	0.0041	0.3060	0.3840	0.0600	4.44	24	20	47
60-80	9.35	0.0184	0.000172	0.0043	0.2070	0.0930	0.0510	4.77	28	18	51
80-100	9.27	0.0162	0.000222	0.0050	0.0278	0.3310	0.0350	2.53	24	22	41
0-10	8.35	0.0360	0.000401	0.0037	0.1150	0.3410	0.0360	1.39	7	12	13
20-40	10.16	0.0367	0.000150	0.0029	0.1420	0.2570	0.0350	1.76	61	10	27
40-60	10.30	0.0212	0.000153	0.0027	0.1930	0.2380	0.0400	1.82	57	10	29
60-80	10.32	0.0212	0.000164	0.0042	0.1860	0.2370	0.0370	1.93	57	12	29
80-100	10.32	0.0176	0.000161	0.0075	0.0055	0.2730	0.0290	0.92	58	10	29
0-10	9.06	0.0155	0.000424	0.0024	0.0570	0.2560	0.0356	1.14	77	10	9
20-40	9.45	0.0346	0.000168	0.0032	0.1140	0.3140	0.0400	1.56	53	16	27
40-60	10.37	0.0254	0.000197	0.0025	0.1990	0.2520	0.0406	1.35	61	18	19
60-80	10.37	0.0184	0.000163	0.0031	0.2210	0.2600	0.0383	1.41	57	14	25
80-100	10.47	0.0106	0.000163	0.0034	0.2040	0.2710	0.0406	1.11	61	16	21

Physical and Chemical Properties of Soil in Maenyo, Mahlaing Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.76	0.0240	0.003930	0.0082	0.0034	0.2180	0.0340	1.79	80	8	7
20-40	8.43	0.0191	0.004140	0.0128	0.0040	0.2270	0.0270	1.74	82	8	7
40-60	9.03	0.0212	0.000105	0.0115	0.0066	0.5600	0.0210	2.96	81	8	9
60-80	9.20	0.0191	0.000600	0.0117	0.0030	0.4700	0.0100	0.37	85	6	5
80-100	8.90	0.0191	0.000082	0.0107	0.0016	0.3800	0.0140	1.96	86	6	5
0-10	9.35	0.0318	0.002030	0.0110	0.0269	0.3880	0.0200	3.20	65	26	11
20-40	8.51	0.0458	0.000005	0.0102	0.2010	0.4110	0.0340	3.77	41	14	38
40-60	9.74	0.0332	Trace	0.0128	0.3000	0.3010	0.0790	3.47	10	34	52
60-80	7.86	0.0424	Trace	0.0134	0.3570	0.2620	0.0840	3.91	11	38	48
80-100	7.60	0.0424	Trace	0.0490	0.3700	0.2580	0.1110	3.44	10	40	46
0-10	7.33	0.0233	0.000960	0.0520	0.0026	0.1480	0.0530	3.54	11	12	12
20-40	3.83	0.0198	0.001530	0.0046	0.0021	0.1320	0.0550	3.28	70	16	12
40-60	7.30	0.0212	0.000700	0.0074	0.0038	0.1570	0.0630	1.17	66	18	12
60-80	7.78	0.0219	0.003920	0.0038	0.0053	0.1850	0.0730	1.26	70	18	8
80-100	7.83	0.0254	0.002690	0.0040	0.0058	0.1940	0.0770	1.73	62	26	10

Physical and Chemical Properties of Soil in Kyaukku, Nyaung Oo Township

Depth (cm)	pH	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.40	0.0099	0.000072	0.0133	0.0030	0.2790	0.1260	0.49	75	12	9
20-40	8.63	0.0074	0.002310	0.0110	0.0040	0.0560	0.0400	0.20	86	4	7
40-60	9.14	0.0045	0.002010	0.0124	0.0046	0.0710	0.0520	0.43	84	6	7
60-80	8.92	0.0117	0.002250	0.0113	0.0061	0.0620	0.0490	0.11	84	4	7
80-100	8.80	0.0120	0.002320	0.0104	0.0066	0.0520	0.0420	0.82	89	8	1
0-10	8.27	0.0038	0.001780	0.0098	0.0018	0.1540	0.0650	0.51	88	8	1
20-40	8.52	0.0074	0.001470	0.0090	0.0021	0.1730	0.0680	0.63	88	10	1
40-60	8.73	0.0035	0.001370	0.0083	0.0020	0.1700	0.0690	0.85	88	10	1
60-80	8.77	0.0109	0.001330	0.0096	0.0022	0.1990	0.0810	0.85	88	10	1
80-100	8.23	0.0096	0.001250	0.0081	0.0026	0.1700	0.0710	0.86	85	10	1
0-10	8.04	0.0113	0.001230	0.0118	0.0017	0.2800	0.0180	0.25	85	10	1
20-40	8.20	0.0092	0.000037	0.0080	0.0018	0.2100	0.0230	0.07	86	8	3
40-60	8.28	0.0124	0.000344	0.0087	0.0017	0.2410	0.0170	0.94	88	8	1
60-80	8.30	0.0049	0.000857	0.0080	0.0017	0.1560	0.0090	0.24	89	2	5
80-100	8.40	0.0060	0.001060	0.0104	0.0024	0.1060	0.0080	0.26	92	2	5
0-10	8.53	0.0120	0.000380	0.0107	0.0053	0.3590	0.0910	0.28	84	10	3
20-40	9.48	0.0122	0.000603	0.0162	0.0112	0.2210	0.1110	0.33	82	12	1
40-60	9.71	0.0120	0.000414	0.1720	0.0164	0.2240	0.1180	0.51	83	6	7
60-80	10.01	0.0127	0.000518	0.2230	0.0288	0.2170	0.1250	0.42	84	6	7
80-100	9.97	0.0124	0.000883	0.0251	0.0299	0.1790	0.1010	0.32	83	6	7
0-10	9.34	0.0064	0.000280	0.0142	0.0233	0.3270	0.0700	0.11	49	30	17
20-40	10.15	0.0095	0.000300	0.0216	0.1450	0.2280	0.0980	0.08	52	30	17
40-60	10.34	0.0046	0.000016	0.0273	0.1010	0.1490	0.1060	0.09	53	32	15
60-80	10.30	0.0057	0.000030	0.0258	0.0990	0.1670	0.1020	0.81	55	40	1
80-100	10.27	0.0071	0.000012	0.0254	0.1060	0.1680	0.0980	0.81	69	24	5

Physical and Chemical Properties of Soil in Pynma, Nyaung Oo Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava.P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.35	0.0071	0.000024	0.0171	0.0056	0.5300	0.0169	2.12	71	14	13
20-40	8.77	0.0163	0.000006	0.0163	0.0046	0.4400	0.0126	3.26	58	16	21
40-60	8.36	0.0096	0.000009	0.0098	0.0017	0.3800	0.0173	2.78	64	16	17
60-80	8.33	0.0103	0.000010	0.0174	0.0015	0.4000	0.0219	2.86	58	22	17
80-100	8.41	0.0078	0.000006	0.0161	0.0015	0.4020	0.0195	2.81	59	20	17
0-10	8.49	0.0089	0.000005	0.0164	0.0014	0.4300	0.0194	2.55	79		19
20-40	8.59	0.0106	0.000006	0.0148	0.0025	0.4010	0.0201	2.46	54	16	25
40-60	8.54	0.0085	0.000014	0.0147	0.0008	0.3800	0.0257	2.86	55	16	25
60-80	8.61	0.0071	0.000004	0.0143	0.0015	0.3600	0.0291	1.82	59	16	21
80-100	8.66	0.0085	Trace	0.0146	0.0024	0.4200	0.0311	1.83	59	20	17
0-10	8.65	0.0064	Trace	0.0390	0.0012	0.3500	0.0144	2.50	62	20	17
20-40	8.72	0.0078	0.000004	0.0388	0.0023	0.3800	0.0169	2.72	64	14	17
40-60	8.87	0.0046	Trace	0.0370	0.0018	0.4200	0.0280	1.65	63	16	17
60-80	8.95	0.0053	Trace	0.0500	0.0033	0.4000	0.0232	2.67	63	16	17
80-100	8.97	0.0064	Trace	0.0410	0.0028	0.4100	0.0241	3.11	59	18	19
0-10	8.83	0.0081	Trace	Trace	0.0012	0.3800	0.0242	3.07	76	12	9
20-40	9.15	0.0057	0.000006	0.0278	0.0006	0.3950	0.0254	1.31	74	12	7
40-60	8.85	0.0042	0.000008	0.0280	0.0015	0.4500	0.0351	1.81	77	12	7
60-80	8.95	0.0035	0.000008	0.0164	0.0012	0.3970	0.0500	1.77	81	10	5
80-100	8.91	0.0049	0.000012	0.0137	0.0007	0.4070	0.0500	1.32	84	8	5
0-10	8.19	0.0042	0.000006	0.0161	0.0030	0.5000	0.0259	3.10	59	20	17
20-40	8.35	0.0078	0.000004	0.0264	0.0041	0.4400	0.0354	2.38	76	14	7
40-60	8.23	0.0042	0.000015	0.0369	0.0040	0.4050	0.0570	1.46	77	14	5
60-80	8.22	0.0039	0.000015	0.0394	0.0024	0.3550	0.0920	1.69	72	18	5
80-100	8.33	0.0057	0.000006	0.0098	0.0020	0.3570	0.0800	3.00	75	20	1

Physical and Chemical Properties of Soil in Shwekyin, Kyaukpadaung Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.67	0.0078	0.000019	0.0154	0.0022	0.3800	0.0130	5.58	23	44	29
20-40	7.82	0.0071	0.000010	0.0172	0.0040	0.3760	0.0190	4.76	39	30	25
40-60	7.84	0.0039	0.003620	0.0165	0.0030	0.2800	0.0200	4.81	40	36	19
60-80	7.87	0.0067	0.000086	0.0162	0.0060	0.3690	0.0240	5.31	48	36	13
80-100	7.95	0.0081	0.000056	0.0158	0.0053	0.3020	0.0240	3.20	46	38	13
0-10	8.22	0.0089	0.000037	0.0178	0.0041	0.1750	0.0730	3.49	23	34	39
20-40	8.11	0.0078	0.003420	0.0160	0.0046	0.0920	0.0910	4.71	6	40	49
40-60	8.07	0.0049	0.002810	0.0156	0.0060	0.0930	0.0940	5.48	21	42	35
60-80	8.12	0.0078	0.003560	0.0172	0.0086	0.0980	0.1050	5.22	9	52	35
80-100	8.14	0.0053	0.004540	0.0178	0.0080	0.0900	0.0990	5.43	24	58	17
0-10	8.00	0.0038	0.000790	0.0228	0.0023	0.3200	0.0180	4.34	58	12	25
20-40	8.20	0.0095	0.000001	0.0058	0.0021	0.3460	0.0190	3.92	52	14	29
40-60	8.06	0.0089	0.000023	0.0035	0.0021	0.4000	0.0200	4.06	51	16	31
60-80	7.97	0.0089	0.000002	0.0036	0.0029	0.3900	0.0220	3.82	51	18	29
80-100	7.96	0.0039	Trace	0.0034	0.0031	0.4200	0.0230	5.58	64	18	17
0-10	8.21	0.0057	0.000002	0.0040	0.0020	0.4100	0.0220	2.86	77	10	11
20-40	8.54	0.0053	Trace	0.0041	0.0019	0.3300	0.0230	2.77	78	10	9
40-60	8.66	0.0049	Trace	0.0031	0.0029	0.3800	0.0340	2.70	78	10	7
60-80	8.64	0.0035	Trace	0.0034	0.0037	0.4000	0.0300	2.22	86	10	1
80-100	8.73	0.0067	Trace	0.0030	0.0024	0.3800	0.0260	2.86	81	10	7
0-10	8.34	0.0067	0.000005	0.0041	0.0030	0.4140	0.0202	6.54	56	8	31
20-40	8.51	0.0081	Trace	0.0031	0.0024	0.3700	0.0205	5.40	57	14	27
40-60	8.66	0.0057	Trace	0.0025	0.0024	0.3100	0.0299	4.72	66	16	13
60-80	8.64	0.0060	Trace	0.0032	0.0039	0.3890	0.0350	4.72	69	16	11
80-100	8.62	0.0057	Trace	0.0032	0.0038	0.3550	0.0570	4.22	73	20	3

Physical and Chemical Properties of Soil in Kyaukpon, Kyaukpadaung Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.12	0.0346	0.001129	0.0135	0.0026	0.2860	0.0520	2.39	76	10	11
20-40	7.98	0.0212	0.000544	0.0101	0.0029	0.2960	0.0580	3.25	69	8	19
40-60	8.26	0.0233	0.000047	0.0062	0.0024	0.4900	0.0690	3.23	70	8	19
60-80	8.44	0.0240	0.000042	0.0048	0.0007	0.4500	0.0800	2.68	82	8	19
80-100	8.54	0.0240	0.000018	0.0059	0.0025	0.3700	0.1180	3.03	88	6	5
0-10	8.53	0.0042	Trace	0.0163	0.0028	0.4000	0.0380	2.77	69	16	11
20-40	8.52	0.0053	Trace	0.0150	0.0051	0.3850	0.0440	2.63	69	16	11
40-60	8.67	0.0081	Trace	0.0153	0.0028	0.3500	0.0380	1.48	74	16	9
60-80	8.69	0.0060	Trace	0.0156	0.0041	0.3820	0.0490	1.34	70	16	11
80-100	8.66	0.0074	Trace	0.0149	0.0046	0.3240	0.0720	1.29	71	16	9
0-10	8.36	0.0219	0.000017	0.0071	0.0003	0.4000	0.0860	1.61	60	20	17
20-40	8.67	0.0226	0.000026	0.0061	0.0030	0.4500	0.0750	1.05	42	34	19
40-60	8.56	0.0162	0.000719	0.0072	0.0017	0.4000	0.0830	0.92	49	32	15
60-80	8.48	0.0219	0.000026	0.0067	0.0023	0.3900	0.0890	1.84	39	36	23
80-100	8.60	0.0169	0.000013	0.0062	0.0017	0.3900	0.0970	1.58	61	24	11
0-10	7.84	0.0078	0.000262	0.0184	0.0033	0.3270	0.0580	2.66	50	26	21
20-40	8.15	0.0049	Trace	0.0234	0.0046	0.3230	0.0500	7.22	9	34	53
40-60	8.40	0.0109	0.000610	0.0280	0.0057	0.2460	0.0670	7.50	5	32	57
60-80	7.65	0.0103	0.002440	0.0188	0.0052	0.2230	0.0670	4.64	14	40	41
80-100	7.91	0.0067	Trace	0.0160	0.0043	0.1700	0.0810	3.52	39	28	29
0-10	8.19	0.0544	0.000027	0.0083	0.0004	0.5300	0.0250	2.91	62	12	21
20-40	8.57	0.0212	0.000032	0.0088	0.0006	0.4900	0.0170	1.58	85	4	7
40-60	8.65	0.0177	0.000140	0.0090	0.0004	0.4800	0.0220	1.12	90	2	5
60-80	8.80	0.0212	0.002890	0.0097	0.0013	0.2420	0.0210	1.19	89	8	1
80-100	8.92	0.0450	0.003340	0.0092	0.0020	0.1840	0.0200	1.31	89	8	1

Physical and Chemical Properties of Soil in Saykhingyi, Nwahtogyi Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.63	0.0350	0.000200	0.0025	0.0033	0.1080	0.0120	1.43	76	12	8
20-40	8.89	0.0140	0.000006	0.0017	0.0014	0.1930	0.0110	0.57	90	4	2
40-60	9.02	0.0280	0.000001	0.0047	0.0021	0.1880	0.0100	1.00	81	8	8
60-80	9.05	0.0140	Trace	0.0013	0.0036	0.1810	0.0120	0.80	87	6	4
80-100	9.04	0.0110	0.000040	0.0017	0.0004	0.1790	0.0140	0.84	88	6	2
0-10	9.83	0.0180	0.000011	0.0016	0.0133	0.1660	0.0250	1.39	64	22	10
20-40	10.04	0.0350	0.000002	0.0018	0.1490	0.0850	0.0380	2.90	35	38	24
40-60	10.24	0.0420	0.000002	0.0018	0.1780	0.0880	0.0390	3.52	27	44	24
60-80	10.27	0.0850	0.000008	0.0021	0.2140	0.0560	0.0370	3.67	17	34	46
80-100	10.26	0.0850	0.000002	0.0027	0.2250	0.0520	0.0360	4.06	19	30	46
0-10	9.65	0.1028	0.000297	0.0041	0.0200	0.1790	0.0180	1.24	60	20	18
20-40	10.28	0.0250	0.000075	0.0020	0.0760	0.1540	0.0190	1.07	63	16	18
40-60	9.96	0.0140	0.000051	0.0013	0.1360	0.1190	0.0280	1.36	45	22	30
60-80	9.86	0.0140	Trace	0.0010	0.1540	0.1160	0.0280	1.61	46	22	30
80-100	9.93	0.0910		0.0016	0.1520	0.1150	0.0270	1.66	45	22	30
0-10	8.39	0.0110	0.000040	0.0033	0.0043	0.1950	0.0100	3.81	56	24	16
20-40	8.67	0.0740	0.000043	0.0020	0.0037	0.1840	0.0090	3.77	52	28	16
40-60	8.70	0.0590	0.000310	0.0020	0.0036	0.1890	0.0110	3.23	45	34	18
60-80	8.60	0.0590	0.000448	0.0013	0.0042	0.1780	0.0160	3.18	38	38	20
80-100	8.78	0.0530	0.000114	0.0029	0.0046	0.1780	0.0200	3.48	35	36	24

Physical and Chemical Properties of Soil in Taungtha Taung, Taungtha Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.52	0.0770	0.000858	0.0020	0.0128	0.2960	0.0460	2.24	33	34	30
20-40	9.26	0.0250	0.000439	0.0017	0.1760	0.1080	0.1280	1.91	20	74	2
40-60	9.13	0.0250	0.000082	0.0014	0.1670	0.1520	0.1440	1.38	16	80	2
60-80	8.93	0.0180	0.000061	0.0014	0.1700	0.1700	0.1650	2.53	19	76	2
80-100	9.39	0.0180	0.000074	0.0014	0.2050	0.1380	0.1260	2.03	20	74	2
0-10	10.16	0.0350	0.000085	0.0010	0.1250	0.1360	0.0570	3.16	44	30	22
20-40	10.35	0.0210	0.000171	0.0007	0.1220	0.2550	0.0300	2.71	55	24	18
40-60	10.39	0.0140	0.004060	0.0009	0.1080	0.2200	0.0310	2.52	59	20	18
60-80	10.34	0.0180	0.005970	0.0016	0.1070	0.1900	0.0490	2.56	58	20	18
80-100	10.31	0.0140	0.005510	0.0012	0.0640	0.1560	0.0590	2.53	50	24	22
0-10	8.54	0.0210	0.000069	0.0027	0.0042	0.2660	0.0400	0.91	69	20	8
20-40	8.75	0.0280	0.000050	0.0015	0.0254	0.3680	0.0260	1.96	50	26	20
40-60	8.53	0.0320	0.000051	0.0015	0.0366	0.3510	0.0260	2.09	49	26	22
60-80	8.67	0.0250	0.000039	0.0012	0.0355	0.3270	0.0260	2.83	58	22	18
80-100	8.74	0.0250	0.000032	0.0011	0.0570	0.2800	0.0290	2.85	50	74	22
0-10	9.19	0.0250	0.000029	0.0016	0.0098	0.2810	0.0180	1.96	68	16	12
20-40	10.06	0.0140	0.000027	0.0016	0.0660	0.2010	0.0180	1.47	76	12	10
40-60	9.84	0.0110	0.000022	0.0016	0.0630	0.1940	0.0220	1.54	73	14	10
60-80	9.70	0.0110	0.000021	0.0012	0.0550	0.1860	0.0260	1.12	81	10	6
80-100	9.51	0.0110	0.000021	0.0012	0.0084	0.1740	0.0320	1.66	74	12	10

Physical and Chemical Properties of Soil in Kanni, Myingyan Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.24	0.0850	0.006020	0.0103	0.0018	0.1170	0.0380	0.88	66	18	12
20-40	8.67	0.0850	0.000071	0.0049	0.0014	0.2620	0.0510	2.62	58	22	16
40-60	8.72	0.0250	0.000567	0.0068	0.0031	0.2520	0.0530	2.19	66	18	12
60-80	8.78	0.0350	0.000332	0.0034	0.0020	0.2540	0.0810	2.94	58	24	14
80-100	8.97	0.0420	0.000228	0.0107	0.0036	0.2500	0.0600	2.90	41	36	20
0-10	8.86	0.0770	0.000077	0.0040	0.0041	0.3760	0.0440	3.62	38	30	29
20-40	10.12	0.0390	0.000086	0.0062	0.0820	0.2600	0.0870	2.32	45	28	21
40-60	10.20	0.0180	0.000104	0.0046	0.0690	0.2130	0.1010	2.91	42	34	7
60-80	10.20	0.0180	0.000094	0.0053	0.0610	0.2000	0.1010	3.39	60	42	5
80-100	10.20	0.0140	0.000091	0.0064	0.0660	0.1720	0.1010	3.75	54	36	5
0-10	10.10	0.0320	0.000093	0.0038	0.0159	0.1590	0.0600	2.10	20	44	30
20-40	10.23	0.0350	0.000105	0.0037	0.3350	0.0630	0.0480	3.38	11	36	48
40-60	10.28	0.0350	0.000139	0.0052	0.3650	0.0580	0.0420	3.52	8	40	48
60-80	10.36	0.0390	0.000109	0.0082	0.3840	0.0710	0.0400	4.42	5	54	38
80-100	10.17	0.0280	0.000155	0.0035	0.3860	0.0460	0.0380	4.36	4	46	46
0-10		0.0070	0.000008	0.0042	0.0870	0.2080	0.0290	1.71	61	20	16
20-40	10.26	0.0110	0.000096	0.0054	0.0380	0.1060	0.0910	1.69	66	20	10
40-60	10.37	0.0070	0.000020	0.0026	0.0900	0.1060	0.0400	2.11	73	22	2
60-80	10.10	0.0070	0.000051	0.0032	0.1590	0.0920	0.2100	3.08	78	18	0
80-100	9.51	0.0250	0.000036	0.0058	0.2170	0.0980	0.1220	1.58	16	48	32

Physical and Chemical Properties of Soil in Kokke, Myingyan Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	9.87	0.0320	0.000137	0.0036	0.0750	0.1760	0.0430	1.13	6	66	26
20-40	9.90	0.0420	0.000770	0.0046	0.0138	0.1580	0.0430	1.34	40	44	22
40-60	9.24	0.0320	0.000697	0.0068	0.0130	0.2420	0.0320	2.07	13	50	34
60-80	9.62	0.0460	0.007540	0.0044	0.1730	0.0840	0.0390	2.17	12	86	0
80-100	9.75	0.0700	0.000574	0.0058	0.1760	0.1440	0.0450	2.45	19	46	32
0-10	7.79	0.0110	0.000138	0.0056	0.0630	0.2230	0.0370	3.72	12	82	2
20-40	8.35	0.0530	0.000162	0.0064	0.0063	0.2570	0.0110	1.97	16	48	32
40-60	7.96	0.0110	0.000159	0.0047	0.0630	0.2310	0.0330	3.82	25	40	30
60-80	7.67	0.0390	0.000196	0.0067	0.0600	0.2290	0.0330	3.33	16	78	2
80-100	8.05	0.0530	0.000163	0.0079	0.0810	3.5000	0.0310	2.78	40	34	22
0-10	8.40	0.0530	0.007520	0.0067	0.0031	0.2550	0.0190	2.35	44	36	16
20-40	8.48	0.0490	0.000151	0.0095	0.0172	0.3880	0.0300	2.90	34	36	26
40-60	8.21	0.0380	0.000363	0.0039	0.0132	0.2710	0.0250	2.97	40	34	22
60-80	8.95	0.0490	0.001695	0.0051	0.0082	0.2310	0.0230	2.95	63	20	13
80-100	8.74	0.0740	0.006280	0.0035	0.0210	0.3590	0.0300	5.31	60	12	23
0-10	8.37	0.0630	0.000449	0.0051	0.0164	0.3280	0.0400	5.19	27	46	23
20-40	8.60	0.0670	0.000412	0.0120	0.0297	0.3250	0.0430	4.95	30	28	37
40-60	8.54	0.0530	0.000135	0.0057	0.0039	0.2910	0.0220	4.08	42	28	34
60-80	8.49	0.0700	0.006350	0.0047	0.0235	0.2240	0.3800	4.87	32	32	32
80-100	8.18	0.0590	0.000395	0.0064	0.0092	0.2300	0.0390	5.46	26	34	36
0-10	8.39	0.0490	0.000284	0.0042	0.0280	0.4700	0.0260	1.60	62	14	20
20-40	9.55		0.000057	0.0056	0.1160	0.0350	1.1100				
40-60	9.74	0.0670	0.000064	0.0023	0.1160	0.1790	0.0330	1.39	22	34	40
60-80	9.02	0.0350	0.000011	0.0012	0.2280	0.0470	1.0000				
80-100	8.78	0.0210	0.001020	0.0027	0.4000	0.2430	0.0700	0.89	10	76	10

Physical and Chemical Properties of Soil in Chayyardaw, Sagaing Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.45	0.0431	0.000076	0.0092	0.0028	0.3500	0.0150	3.02	67	16	13
20-40	8.64	0.0240	0.000105	0.0040	0.0044	0.3310	0.0377	3.04	61	22	13
40-60	8.68	0.0226	0.000044	0.0060	0.0047	0.2090	0.0430	3.19	34	40	21
60-80	8.92	0.0184	0.000053	0.0036	0.0027	0.1890	0.0650	2.67	61	22	11
80-100	8.85	0.0198	0.000040	0.0033	0.0024	0.2000	0.0510	2.34	75	10	9
0-10	8.98	0.0275	0.002280	0.0018	0.0024	0.2050	0.0191	1.89	65	16	15
20-40	8.98	0.0272	0.001600	0.0060	0.0043	0.1570	0.0139	2.04	65	18	15
40-60	9.16	0.0282	0.001250	0.0061	0.0096	0.1770	0.0129	2.29	65	18	15
60-80	9.34	0.0318	0.001630	0.0111	0.0220	0.1310	0.0152	2.20	70	12	17
80-100	9.51	0.0247	0.001440	0.0086	0.0332	0.1300	0.0151	2.26	64	16	17
0-10	8.91	0.0381	0.000039	0.0075	0.0031	0.2900	0.0217	1.60	58	16	23
20-40	9.11	0.0237	0.000031	0.0076	0.0027	0.4150	0.0286	2.93	59	16	23
40-60	9.26	0.0162	0.001640	0.0089	0.0030	0.1880	0.0126	1.86	74	12	11
60-80	9.24	0.0198	0.000044	0.0066	0.0026	0.3900	0.0328	1.72	69	14	15
80-100	9.35	0.0184	0.000033	0.0016	0.0040	0.3580	0.0396	1.89	69	14	15
0-10	8.35	0.0268	0.001580	0.0038	0.0021	0.1040	0.0168	1.88	71	16	11
20-40	8.37	0.0208	0.001530	0.0031	0.0031	0.1190	0.0171	2.16	71	114	11
40-60	9.11	0.0244	0.000053	0.0024	0.0021	0.3100	0.0275	2.36	67	12	19
60-80	9.24	0.0162	0.000313	0.0021	0.0030	0.4600	0.0196	1.97	70	18	9
80-100	9.29	0.0194	0.001490	0.0019	0.0025	0.2400	0.0171	1.68	80	8	9

Physical and Chemical Properties of Soil in Minwun, Sagaing Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.95	0.2080	0.000404	0.0047	0.0040	0.2280	0.0138	2.66	70	16	9
20-40	7.95	0.0275	0.000646	0.0045	0.0028	0.1700	0.0156	3.70	71	16	9
40-60	8.07	0.0198	0.000073	0.0030	0.0026	0.3310	0.0092	4.06	61	8	27
60-80	8.26	0.0233	0.000050	0.0034	0.0027	0.3210	0.0103	3.48	53	20	21
80-100	8.53	0.0162	0.000055	0.0031	0.0029	0.3150	0.0123	3.18	67	18	13
0-10	8.53	0.0378	0.000066	0.0027	0.0022	0.4700	0.0130	1.75	71	16	10
20-40	8.64	0.0452	0.000058	0.0021	0.0016	0.4700	0.0120	2.63	68	16	14
40-60	8.78	0.0360	0.000061	0.0020	0.0014	0.4900	0.0140	2.24	61	18	16
60-80	8.85	0.0381	0.000054	0.0019	0.0024	0.4400	0.0140	2.25	61	18	16
80-100	9.03	0.0395	0.000052	0.0020	0.0017	0.3600	0.0170	2.73	60	22	16
0-10	8.95	0.0342	0.000344	0.0035	0.0025	0.2800	0.0220	1.23	78	10	8
20-40	9.00	0.0395	0.000274	0.0029	0.0027	0.3800	0.0160	1.41	84	6	6
40-60	9.00	0.0258	0.000079	0.0022	0.0029	0.3100	0.0130	1.58	72	18	8
60-80	9.01	0.0226	0.000084	0.0022	0.0031	0.4400	0.0130	1.85	72	18	8
80-100	9.00	0.0208	0.000025	0.0013	0.0031	0.3700	0.0140	2.20	71	18	8

Physical and Chemical Properties of Soil in Nganzun Township

Depth(cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.66	0.0632	0.000178	0.0044	0.0027	0.5700	0.0780	2.59	69	12	15
20-40	8.70	0.0424	0.000077	0.0034	0.0028	0.3540	0.0680	2.28	71	10	15
40-60	8.84	0.0353	0.000115	0.0045	0.0028	0.2900	0.0650	2.18	69	10	17
60-80	8.98	0.0219	0.001150	0.0028	0.0026	0.3010	0.0650	2.80	74	8	13
80-100	9.04	0.0250	0.002790	0.0012	0.0036	0.2990	0.0620	1.98	68	12	15
0-10	8.94	0.0226	0.001300	0.0052	0.0024	0.2670	0.0570	1.95	76	6	13
20-40	9.02	0.0258	0.003880	0.0061	0.0051	0.3600	0.0550	2.36	75	6	13
40-60	8.96	0.0240	0.000065	0.0027	0.0051	0.3800	0.0450	2.55	76	6	15
60-80	8.86	0.0162	0.000920	0.0029	0.0027	0.3770	0.0580	1.73	82	4	11
80-100	8.95	0.0191	0.001400	0.0033	0.0026	0.3550	0.0570	1.74	81	4	13
0-10	7.02	0.0401	0.004820	0.0159	0.0102	0.1510	0.0340	2.90	71	12	13
20-40	8.59	0.0406	0.004670	0.0049	0.0025	0.1090	0.0250	0.95	73	8	15
40-60	8.19	0.0194	0.003340	0.0044	0.0019	0.0990	0.0200	0.55	75	6	15
60-80	8.60	0.0279	0.002760	0.0033	0.0260	0.0760	0.0200	1.04	78	6	15
80-100	8.42	0.0177	0.003100	0.0032	0.0029	0.1450	0.0260	1.20	79	4	15

Physical and Chemical Properties of Soil in Htisoung, MyinmuTownship

Depth(cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	9.38	0.0409	0.000228	0.0049	0.0119	0.0274	0.0370	1.15	63	10	21
20-40	10.14	0.0171	0.000016	0.0040	0.1220	0.3800	0.0470	0.87	60	10	27
40-60	10.30	0.0208	0.000007	0.0049	0.1330	0.0397	0.0530	0.18	55	16	27
60-80	10.45	0.0212	0.000011	0.0155	0.1120	0.3340	0.0540	1.12	61	14	23
80-100	10.46	0.0191	0.000013	0.0042	0.1370	0.3380	0.0470	0.46	57	12	27
0-10	9.75	0.0247	0.000021	0.0040	0.0402	0.4020	0.0470	0.50	54	16	27
20-40	10.21	0.0177	0.000019	0.0035	0.0610	0.4100	0.5170	0.71	55	16	27
40-60	10.39	0.0219	0.000014	0.0038	0.1660	0.3030	0.0670	0.33	55	16	27
60-80	10.47	0.0159	0.000017	0.0028	0.1460	0.2830	0.0600	0.36	55	16	27
80-100	10.48	0.0198	0.000014	0.0029	0.1970	0.2430	0.0570	0.97	51	16	29
0-10	8.95	0.0434	0.000019	0.0025	0.0311	0.3130	0.0360	1.77	51	20	27
20-40	9.42	0.0221	0.000016	0.0022	0.0710	0.2460	0.0360	1.74	49	18	19
40-60	9.58	0.0197	0.000021	0.0022	0.9500	0.2080	0.0410	1.81	41	18	37
60-80	9.73	0.0162	0.000022	0.0027	0.1360	0.2080	0.0450	2.91	41	18	37
80-100	9.79	0.0161	0.000023	0.0036	0.1510	0.1890	0.0420	1.63	42	18	37
0-10	8.98	0.0039	0.000067	0.0030	0.0230	0.2330	0.0300	0.55	58	16	23
20-40	9.92	0.0169	0.000061	0.0018	0.0117	0.1540	0.0410	0.58	51	16	31
40-60	10.16	0.0138	0.000054	0.0031	0.2310	0.0860	0.0410	0.36	50	12	35
60-80	10.10	0.0169	0.000059	0.0024	0.0278	0.0780	0.0320	0.63	51	16	31
80-100	10.11	0.0148	0.000054	0.0026	0.0267	0.0810	0.0300	1.11	49	16	31

Physical and Chemical Properties of Soil in Bansi, Monywa Township

Depth(cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.12	0.0409	0.000045	0.0037	0.0062	0.3900	0.0360	2.34	27	46	25
20-40	8.98	0.0219	0.000155	0.0023	0.0163	0.3300	0.0800	1.18	69	16	11
40-60	9.43	0.0219	0.000021	0.0027	0.0304	0.3340	0.0990	1.59	45	26	25
60-80	9.80	0.0141	0.000236	0.0023	0.0409	0.3240	0.1100	1.27	58	22	25
80-100	10.00	0.0162	0.000651	0.0032	0.0560	0.2860	0.1270	1.57	66	18	15
0-10	7.84	0.0769	0.004020	0.0064	0.0043	0.2820	0.0410	3.47	39	38	21
20-40	8.04	0.0148	0.002850	0.0028	0.0035	0.4030	0.0370	3.44	26	50	21
40-60	8.15	0.0325	0.000081	0.0030	0.0032	0.3900	0.0490	3.28	27	48	23
60-80	8.30	0.0226	0.003400	0.0035	0.0035	0.3760	0.0630	2.69	24	56	19
80-100	8.40	0.0247	0.000137	0.0033	0.0035	0.3500	0.0550	0.70	29	50	19
0-10	8.01	0.0593	0.000062	0.0029	0.0024	0.4800	0.0120	1.97	42	36	19
20-40	8.32	0.0212	0.000021	0.0019	0.0039	0.5100	0.0100	2.26	74	14	9
40-60	8.55	0.0311	0.000027	0.0020	0.0098	0.5100	0.0240	1.47	25	46	27
60-80	8.59	0.0226	0.000041	0.0029	0.0085	0.5400	0.0180	1.82	42	36	19
80-100	8.93	0.0184	0.000051	0.0026	0.0081	0.4400	0.0190	2.11	64	20	13
0-10	9.70	0.0289	0.000084	0.0045	0.0148	0.4500	0.0420	1.83	28	40	27
20-40	9.70	0.0219	0.000092	0.0039	0.0630	0.3510	0.0930	2.36	50	30	17
40-60	10.25	0.0177	0.000134	0.0068	0.1410	0.2990	0.0720	1.96	20	54	21
60-80	10.58	0.0141	0.002750	0.0081	0.2000	0.1780	0.1010	3.61	29	46	23
80-100	10.59	0.0205	0.002110	0.0087	0.2830	0.1540	0.0860	2.60	18	44	33
0-10	9.87	0.0226	0.000076	0.0041	0.1400	0.4100	0.0220	1.24	31	40	27
20-40	10.42	0.0226	0.000127	0.0037	0.2000	0.3510	0.0310	2.09	21	46	31
40-60	10.79	0.0177	0.000215	0.0037	0.3260	0.2170	0.0470	0.58	11	54	33
60-80	10.84	0.0191	0.000150	0.0039	0.1890	0.2700	0.0360	0.52	55	28	15
80-100	10.84	0.0219	0.000098	0.0037	0.1600	0.3800	0.0220	0.82	60	24	13

Physical and Chemical Properties of Soil in Nwekway, Chaung Oo Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	9.47	0.0261	0.000020	0.0040	0.1040	0.3800	0.0490	2.32	8	40	49
20-40	9.94	0.0205	0.002240	0.0045	0.0147	0.2530	0.0630	2.86	39	42	17
40-60	10.25	0.0164	0.000096	0.0038	0.1720	0.3430	0.0910	2.03	49	38	11
60-80	10.16	0.0226	0.000072	0.0034	0.1540	0.3710	0.0730	1.56	39	50	11
80-100	10.38	0.0212	0.000034	0.0045	0.1840	0.3320	0.0920	1.54	41	46	11
0-10	8.05	0.0244	0.000020	0.0056	0.0045	0.4000	0.0220	3.60	44	38	15
20-40	9.27	0.0205	0.000025	0.0044	0.0910	0.3500	0.0650	2.26	32	50	17
40-60	9.41	0.0169	0.000031	0.0053	0.0880	0.3500	0.0910	2.45	31	52	15
60-80	9.60	0.0219	0.000041	0.0039	0.1030	0.4100	0.0800	2.44	20	58	17
80-100	9.70	0.0191	0.000041	0.0037	0.1360	0.3630	0.1070	2.73	21	58	17
0-10	8.11	0.0212	0.000046	0.0048	0.0025	0.4500	0.0230	2.04	79	10	9
20-40	8.18	0.0193	0.000045	0.0034	0.0031	0.5000	0.0250	1.90	77	12	9
40-60	8.27	0.0205	0.000032	0.0026	0.0025	0.4900	0.0310	2.20	76	10	11
60-80	8.35	0.0148	0.000042	0.0028	0.0024	0.5000	0.0340	1.64	77	10	11
80-100	8.47	0.0141	0.000040	0.0025	0.0029	0.5600	0.0390	1.50			
0-10	7.94	0.0289	0.000039	0.0034	0.0031	0.4800	0.0230	3.85	54	34	9
20-40	8.02	0.0275	0.000040	0.0040	0.0070	0.4200	0.0280	3.38	67	20	17
40-60	8.22	0.0381	0.000056	0.0031	0.0107	0.3900	0.0360	2.16	60	18	17
60-80	8.44	0.0367	0.000069	0.0031	0.0104	0.4900	0.0440	1.61	61	18	19
80-100	8.65	0.0240	0.000063	0.0030	0.0089	0.4300	0.0410	1.51	75	10	13
0-10	9.74	0.0438	0.000054	0.0036	0.0870	0.4500	0.0250	3.12	28	44	27
20-40	10.14	0.0224	0.000060	0.0036	0.1590	0.3700	0.0440	2.08	16	46	37
40-60	10.25	0.0226	0.000068	0.0041	0.2310	0.3100	0.0570	3.08	15	38	45
60-80	10.47	0.0219	0.000062	0.0046	0.2140	0.2800	0.0820	2.39	24	46	29
80-100	10.55	0.0191	0.000016	0.0058	0.2880	0.2300	0.0830	2.16	20	48	29

Physical and Chemical Properties of Soil in Yeposa, Chaung Oo Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	8.13	0.0212	0.000084	0.0028	0.0066	0.399	0.043	0.45	61	28	9
20-40	8.24	0.0226	0.000620	0.0022	0.0017	0.325	0.060	0.25	86	6	7
40-60	8.26	0.0155	0.000402	0.0018	0.0030	0.300	0.068	0.69	71	14	11
60-80	8.48	0.0198	0.000335	0.0009	0.0034	0.318	0.069	0.75	78	8	11
80-100	8.64	0.0212	0.001020	0.0012	0.0040	0.226	0.053	0.66	82	6	7
0-10	8.62	0.0261	0.000038	0.0016	0.0047	0.368	0.071	0.90	71	12	15
20-40	9.00	0.0247	0.000035	0.0056	0.0030	0.289	0.098	0.88	81	8	7
40-60	9.20	0.0183	0.001130	0.0284	0.0048	0.199	0.100	0.58	80	12	5
60-80	9.45	0.0177	0.002020	0.0227	0.0040	0.110	0.063	0.52	82	6	7
80-100	9.60	0.0169	0.002800	0.0016	0.0036	0.220	0.049	0.55	85	4	7
0-10	9.04	0.0219	0.000065	0.0085	0.0025	0.323	0.032	0.67	51	22	25
20-40	9.07	0.0169	0.000036	0.0036	0.0037	0.328	0.104	2.12	56	18	23
40-60	9.12	0.0219	0.000030	0.0035	0.0054	0.323	0.044	1.55	50	20	27
60-80	8.96	0.0311	0.000027	0.0013	0.0045	0.327	0.051	2.10	61	14	22
80-100	9.10	0.0263	0.000021	0.0007	0.0101	0.331	0.055	2.08	62	14	22
0-10	9.10	0.0205	0.000009	0.0055	0.0055	0.373	0.044		60	16	19
20-40	8.88	0.0388	0.000005	0.0052	0.0033	0.372	0.046	1.76	67	14	17
40-60	8.92	0.0212	0.000019	0.0021	0.0026	0.364	0.047	1.95	77	12	15
60-80	8.98	0.0289	0.000005	0.0010	0.0014	0.326	0.058	1.05	71	12	13
80-100	9.10	0.0169	0.000004	0.0016	0.0006	0.341	0.068	0.71	79	10	7
0-10	9.96	0.0198	0.001160	0.0069	0.0199	0.217	0.074	0.25	72	14	9
20-40	10.62	0.0162	0.001420	0.0058	0.1810	0.130	0.061	0.47	68	22	7
40-60	10.66	0.0155	0.003970	0.0035	0.3110	0.042	0.019	0.90	82	10	3
60-80	10.64	0.0198	0.006920	0.0045	0.3380	0.058	0.210	1.28	81	80	5
80-100	10.87	0.0226	0.000046	0.0048	0.3150	0.150	0.078	1.43	64	24	7

Physical and Chemical Properties of Soil in Twin Taung, Butalin Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.95	0.0311	0.000036	0.0022	0.0136	0.440	0.0221	3.26	56	26	15
20-40	8.03	0.0191	0.000027	0.0017	0.0126	0.440	0.0141	1.78	67	22	7
40-60	8.38	0.0141	0.000149	0.0020	0.0118	0.460	0.2300	1.12	56	32	7
60-80	8.48	0.0148	0.002200	0.0019	0.0083	0.570	0.0277	1.56	50	42	7
80-100	8.74	0.0141	0.000174	0.0020	0.0044	0.380	0.0389	0.86	81	12	5
0-10	8.67	0.0219	0.000064	0.0020	0.0278	0.183	0.0690	3.48	50	32	13
20-40	8.08	0.0381	0.000046	0.0017	0.0058	0.384	0.0190	3.93	59	22	15
40-60	8.10	0.0431	0.000053	0.0019	0.0057	0.540	0.0181	3.85	47	24	25
60-80	8.21	0.0302	0.000052	0.0017	0.0044	0.379	0.0242	4.08	41	28	23
80-100	8.31	0.0217	0.000060	0.0016	0.0057	0.520	0.0243	3.08	56	22	19
0-10	8.93	0.0247	0.000064	0.0033	0.0336	0.353	0.0320	1.64	30	20	45
20-40	8.94	0.0268	0.000070	0.0030	0.0200	0.213	0.0600	2.39	20	20	57
40-60	9.00	0.0191	0.000058	0.0036	0.0570	0.159	0.0750	2.70	23	16	59
60-80	9.08	0.0261	0.000067	0.0040	0.0560	0.153	0.0720	2.78	18	20	59
80-100	9.35	0.0162	0.000076	0.0026	0.0710	0.128	0.0760	0.44	20	18	57
0-10	8.52	0.0353	0.000072	0.0061	0.0070	0.234	0.1410	2.56	32	14	51
20-40	8.81	0.0184	0.000008	0.0026	0.0057	0.297	0.0315	3.95	21	20	55
40-60	8.97	0.0261	0.000168	0.0031	0.0500	0.121	0.0520	3.88	21	16	59
60-80	9.08	0.0205	0.000062	0.0021	0.0600	0.122	0.0910	3.31	23	18	57
80-100	9.17	0.0148	0.005990	0.0030	0.0580	0.134	0.0850	2.11	40	18	37
0-10	7.73	0.0537	0.000054	0.0042	0.0180	0.244	0.414	3.58	57	16	25
20-40	7.90	0.0285	0.000036	0.0029	0.0256	0.161	0.0950	3.56	50	12	35
40-60	7.74	0.0417	0.000044	0.0037	0.0192	0.206	0.0216	2.12	61	16	19
60-80	8.48	0.0198	0.000091	0.0029	0.0240	0.080	0.0950	3.13	53	8	35
80-100	8.65	0.0184	0.000103	0.0051	0.0330	0.069	0.1010	3.03	48	12	37

Physical and Chemical Properties of Soil in Oakpho Taung, Butalin Township

Depth (cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.65	0.0205	0.00261	0.0049	Trace	0.075	0.023	1.14	84	6	5
20-40	8.63	0.0198	0.00227	0.0034	"	0.136	0.026	0.66	90	2	3
40-60	8.52	0.0177	0.00306	0.0010	0.0011	0.065	0.020	0.57	89	2	3
60-80	8.53	0.0177	0.00301	0.0012	0.0025	0.065	0.023	1.09	90	4	3
80-100	7.54	0.0177	0.00392	0.0033	0.0032	0.083	0.030	1.33	81	12	3
0-10	8.67	0.0169	0.00003	0.0023	0.0069	0.401	0.030	4.02	60	18	19
20-40	9.22	0.0254	0.00001	0.0019	0.0047	0.380	0.059	1.56	87	4	7
40-60	9.36	0.0233	0.00590	0.0012	0.0031	0.107	0.050	1.71	90	4	3
60-80	9.41	0.0205	0.00465	0.0025	0.0010	0.115	0.057	1.48	90	4	3
80-100	9.40	0.0184	0.00381	0.0044	0.0006	0.092	0.054	1.63	89	2	3
0-10	8.50	0.0289	0.00004	0.0052	Trace	0.350	0.017	2.90	89	2	3
20-40	8.77	0.0445	0.00000	0.0013	"	0.410	0.017	2.88	97	8	9
40-60	9.05	0.0261	Trace	0.0024	0.0020	0.370	0.016	1.77	82	6	7
60-80	9.11	0.0191	0.00022	0.0037	0.0003	0.398	0.019	1.78	90	2	5
80-100	9.13	0.0169	0.00025	0.0034	0.0012	0.406	0.020	1.52	85	6	5
0-10	8.64	0.0212	Trace	0.0039	Trace	0.360	0.027	2.93	86	4	7
20-40	8.76	0.0162	"	0.0016	0.0022	0.412	0.036	3.70	80	8	9
40-60	9.00	0.0219		0.0014	0.0017	0.365	0.051	0.99	88	4	5
60-80	9.08	0.0177	0.00194	0.0017	0.0036	0.210	0.040	2.52	89	2	5
80-100	9.40	0.0184	0.00001	0.0037	0.0062	0.360	0.046	1.13	91	2	5
0-10	8.81	0.0409	Trace	0.0020	0.0021	0.350	0.036	3.30	70	16	11
20-40	8.18	0.0699	"	0.0026	0.0043	0.407	0.048	5.73	50	10	25
40-60	9.05	0.0332	"	0.0024	0.0017	0.405	0.059	3.23	71	12	13
60-80	8.78	0.0247	"	0.0058	0.0045	0.409	0.072	3.75	71	10	15
80-100	9.23	0.0282	"	0.0042	0.0040	0.384	0.070	3.87	68	14	15

Physical and Chemical Properties of Soil in Salingyi, Yinmarbin Township

Depth(cm)	p ^H	Total N%	Extractable Nutrients					O.M %	Texture		
			Ava. P %	K%	Na %	Ca %	Mg %		Sand%	Silt%	Clay%
0-10	7.67	0.1426	0.000204	0.0032	0.0054	0.1850	0.0188	4.99	51	28	17
20-40	8.40	0.0191	0.000110	0.0021	0.0091	0.1480	0.0184	1.18	38	42	17
40-60	8.24	0.0134	0.000008	0.0017	0.0060	0.2020	0.0132	1.73	31	44	21
60-80	8.18	0.0162	0.000008	0.0017	0.0100	0.2040	0.0094	2.75	41	36	21
80-100	8.30	0.0219	0.000067	0.0022	0.0176	0.2080	0.0052	3.42	43	28	23
0-10	7.70	0.1560	0.000072	0.0053	0.0175	0.1860	0.0220	3.72	30	34	33
20-40	7.61	0.0191	0.000078	0.0038	0.0198	0.1240	0.0319	3.51	45	36	17
40-60	7.42	0.0233	0.000317	0.0034	0.0166	0.1140	0.0238	3.22	43	30	25
60-80	7.64	0.0205	0.000252	0.0032	0.0179	0.1490	0.0218	6.84	42	38	19
80-100	7.84	0.0219	0.000033	0.0028	0.0170	0.1940	0.0189	4.85	31	42	25
0-10	7.60	0.0162	0.001450	0.0065	0.0173	0.1630	0.0540	3.94	61	30	7
20-40	6.89	0.0438	0.000396	0.0030	0.0197	0.1580	0.0300	2.80	51	28	19
40-60	6.83	0.0231	0.000194	0.0036	0.0035	0.8300	0.0630	1.50	62	20	17
60-80	6.70	0.0212	0.000176	0.0027	0.0030	0.7000	0.0042	0.19	51	30	17
80-100	6.96	0.0184	0.000307	0.0030	0.0190	0.0830	0.0288	1.32	58	22	15
0-10	7.60	0.1024	0.000055	0.0032	0.0185	0.4400	0.0242	1.52	42	26	27
20-40	7.52	0.0678	0.000044	0.0031	0.0179	0.4600	0.0253	2.33	36	28	31
40-60	7.58	0.0628	0.000045	0.0027	0.0201	0.7200	0.0215	2.38	40	24	33
60-80	7.55	0.0889	0.000048	0.0049	0.0199	0.6400	0.0177	2.56	30	32	35
80-100	7.82	0.0332	0.000039	0.0047	0.0167	0.4900	0.0115	3.90	32	38	25
0-10	7.85	0.0748	0.000052	0.0059	0.0164	0.5000	0.0248	4.92	27	44	27
20-40	7.92	0.0699	0.000033	0.0051	0.0161	0.4600	0.0118	4.29	27	46	25
40-60	7.99	0.0274	0.000047	0.0052	0.0044	0.3300	0.0088	3.20	27	46	23
60-80	8.13	0.0240	0.000052	0.0045	0.0036	0.5600	0.0069	2.39	41	40	15
80-100	8.23	0.0289	0.000064	0.0048	0.0036	0.5200	0.0074	2.72	41	40	17

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