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TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

TN-SOILS NO. 2

Boise, Idaho
January 26, 1972

GUIDES FOR CALCULATING AVAILABLE WATER CAPACITY

Available water capacity (AWC) is that water held in a soil which is readily available to plants. It is considered to be the difference between the water held at field capacity and the amount held when the soil is at the permanent wilting point.

Attached is a graph and a table that can be used for estimating available water capacity.

The graph can be used for determining the average available water capacity for a soil from 1 to 60 inches deep. For example, we have a fine sandy loam 20 inches deep that overlies a silt loam to 60 inches. Read across the graph at 20 inches to fine sandy loam and down to the available water capacity we get 2.8 inches. Doing the same for the 40 inches of silt loam, we get 8 inches. Add the two and we have an available water capacity of 10.8 inches for the 60 inch profile.

The attached table gives ranges for the different textures and depths. For example, to figure the available water capacity of 35 inches of loam over 25 inches of very gravelly sand. We read 5.6 to 6.3 inches availabe water for the 35 inches of loam and .7 to 1.2 inches available water for the 25 inches of very gravelly sand. We add these and get 6.3 to 7.5 inches available water for the 50 inches of profile. We would probably round this off to 6.5 to 7.5 inches available water capacity.

D. Max Daniels

D. Max Daniels
Asst State Soil Scientist

Attachments (2)

December 1, 1971

U.S. Department of Agriculture
Soil Conservation Service
Boise, Idaho

TABLE FOR ESTIMATING AVAILABLE WATER HOLDING CAPACITY

Depth in ins.	TEXTURE AND AVAILABLE WATER HOLDING CAPACITY													Depth in ins.
	sil, sicl,cl	loam	sic,sc vfsl	c,scl	fsl	sl	lvfs	lfs	gsl	ls	fs,vgl	gs	vgs,g	
	.19-.21	.16-.18	.15-.17	.14-.16	.13-.15	.11-.13	.10-.12	.09-.11	.07-.09	.06-.08	.05-.07	.04-.06	.03-.05	
1	.2	.2	.1-.2	.1-.2	.1	.1	.1	.1	.1	.1	.0-.1	.0-.1	.0-.1	1
2	.4	.3-.4	.3	.3	.3	.2-.3	.2	.2	.1-.2	.1-.2	.1	.1	.1	2
3	.6	.5	.4-.5	.4-.5	.4	.3-.4	.3-.4	.3	.2-.3	.2	.1-.2	.1-.2	.1	3
4	.8	.6-.7	.6-.7	.6	.5-.6	.4-.5	.4-.5	.4	.3-.4	.2-.3	.2-.3	.2	.1-.2	4
5	.9-1.5	.8-.9	.7-.8	.7-.8	.6-.7	.5-.6	.5-.6	.4-.5	.3-.4	.3-.4	.2-.3	.2-.3	.1-.2	5
6	1.1-1.3	1.0-1.1	.9-1.0	.8-1.0	.8-.9	.7-.8	.6-.7	.5-.7	.4-.5	.4-.5	.3-.4	.2-.4	.2-.3	6
7	1.3-1.5	1.1-1.3	1.0-1.2	1.0-1.1	.9-1.0	.8-.9	.7-.8	.6-.8	.5-.6	.4-.5	.3-.5	.3-.4	.2-.3	7
8	1.5-1.7	1.3-1.4	1.2-1.4	1.1-1.3	1.0-1.2	.9-1.0	.8-1.0	.7-.9	.6-.7	.5-.6	.4-.6	.3-.5	.2-.4	8
9	1.7-1.9	1.4-1.6	1.3-1.5	1.3-1.4	1.2-1.3	1.0-1.2	.9-1.1	.8-1.0	.6-.8	.5-.7	.4-.6	.4-.5	.3-.4	9
10	1.9-2.1	1.6-1.8	1.5-1.7	1.4-1.6	1.3-1.5	1.1-1.3	1.0-1.2	.9-1.1	.7-.9	.6-.8	.5-.7	.4-.6	.3-.5	10
11	2.1-2.3	1.8-2.0	1.6-1.9	1.5-1.8	1.4-1.6	1.2-1.4	1.1-1.3	1.0-1.2	.8-1.0	.7-.9	.5-.8	.4-.7	.3-.5	11
12	2.3-2.5	1.9-2.2	1.8-2.0	1.7-1.9	1.6-1.8	1.3-1.6	1.2-1.4	1.1-1.3	.8-1.1	.7-1.0	.6-.8	.5-.7	.4-.6	12
13	2.5-2.7	2.1-2.3	1.9-2.2	1.8-2.1	1.7-1.9	1.4-1.7	1.3-1.6	1.2-1.4	.9-1.2	.8-1.0	.6-.9	.5-.8	.4-.6	13
14	2.7-2.9	2.2-2.5	2.1-2.4	2.0-2.2	1.8-2.1	1.5-1.8	1.4-1.7	1.3-1.5	1.0-1.3	.8-1.1	.7-1.0	.6-.8	.4-.7	14
15	2.8-3.1	2.4-2.7	2.2-2.5	2.1-2.4	1.9-2.2	1.6-1.9	1.5-1.8	1.3-1.6	1.0-1.3	.9-1.2	.7-1.0	.6-.9	.4-.7	15
16	3.0-3.4	2.6-2.9	2.4-2.7	2.2-2.6	2.1-2.4	1.8-2.1	1.6-1.9	1.4-1.8	1.1-1.4	1.0-1.3	.8-1.1	.6-1.0	.5-.8	16
17	3.2-3.6	2.7-3.1	2.5-2.9	2.4-2.8	2.2-2.5	1.9-2.2	1.7-2.0	1.5-1.9	1.2-1.5	1.0-1.4	.8-1.2	.7-1.0	.5-.8	17
18	3.4-3.8	2.9-3.2	2.7-3.1	2.5-2.9	2.3-2.7	2.0-2.3	1.8-2.2	1.6-2.0	1.3-1.6	1.1-1.4	.9-1.3	.7-1.1	.5-.9	18
19	3.6-4.0	3.0-3.4	2.8-3.2	2.7-3.0	2.5-2.8	2.1-2.5	1.9-2.3	1.7-2.1	1.3-1.7	1.1-1.5	.9-1.3	.8-1.1	.6-.9	19
20	3.8-4.2	3.2-3.6	3.0-3.4	2.8-3.2	2.6-3.0	2.2-2.6	2.0-2.4	1.8-2.2	1.4-1.8	1.2-1.6	1.0-1.4	.8-1.2	.6-1.0	20
21	4.0-4.4	3.4-3.8	3.1-3.6	2.9-3.4	2.7-3.1	2.3-2.7	2.1-2.5	1.9-2.3	1.5-1.9	1.3-1.7	1.0-1.5	.8-1.3	.6-1.0	21
22	4.2-4.6	3.5-4.0	3.3-3.7	3.1-3.5	2.9-3.3	2.4-2.9	2.2-2.6	2.0-2.4	1.5-2.0	1.3-1.8	1.1-1.5	.9-1.3	.7-1.1	22
23	4.4-4.8	3.7-4.1	3.4-3.9	3.2-3.7	3.0-3.4	2.5-3.0	2.3-2.8	2.1-2.5	1.6-2.1	1.4-1.8	1.1-1.6	.9-1.4	.7-1.1	23
24	4.6-5.0	3.8-4.3	3.6-4.1	3.4-3.8	3.1-3.6	2.6-3.1	2.4-2.9	2.2-2.6	1.7-2.2	1.4-1.9	1.2-1.7	1.0-1.4	.7-1.2	24
25	4.7-5.2	4.0-4.5	3.7-4.2	3.5-4.0	3.2-3.7	2.7-3.2	2.5-3.0	2.2-2.7	1.7-2.2	1.5-2.0	1.2-1.7	1.0-1.5	.7-1.2	25
26	4.9-5.5	4.2-4.7	3.9-4.4	3.6-4.2	3.4-3.9	2.9-3.4	2.6-3.1	2.3-2.9	1.8-2.3	1.6-2.1	1.3-1.8	1.0-1.6	.8-1.3	26
27	5.1-5.7	4.3-4.9	4.0-4.6	3.8-4.3	3.5-4.0	3.0-3.5	2.7-3.2	2.4-3.0	1.9-2.4	1.6-2.2	1.3-1.9	1.1-1.6	.8-1.3	27
28	5.3-5.9	4.5-5.0	4.2-4.8	3.9-4.5	3.6-4.2	3.1-3.6	2.8-3.4	2.5-3.1	2.0-2.5	1.7-2.2	1.4-2.0	1.1-1.7	.8-1.4	28
29	5.5-6.1	4.6-5.2	4.3-4.9	4.1-4.6	3.8-4.3	3.2-3.8	2.9-3.5	2.6-3.2	2.0-2.6	1.7-2.3	1.4-2.0	1.2-1.7	.9-1.4	29
30	5.7-6.3	4.8-5.4	4.5-5.1	4.2-4.8	3.9-4.5	3.3-3.9	3.0-3.6	2.7-3.3	2.1-2.7	1.8-2.4	1.5-2.1	1.2-1.8	.9-1.5	30
31	5.9-6.5	5.0-5.6	4.6-5.3	4.3-5.0	4.0-4.6	3.4-4.0	3.1-3.7	2.8-3.4	2.2-2.8	1.9-2.5	1.5-2.2	1.2-1.9	.9-1.5	31
32	6.1-6.7	5.1-5.8	4.8-5.4	4.5-5.1	4.2-4.8	3.5-4.2	3.2-3.8	2.9-3.5	2.2-2.9	1.9-2.6	1.6-2.2	1.3-1.9	1.0-1.6	32
33	6.3-6.9	5.3-5.9	4.9-5.6	4.6-5.3	4.3-4.9	3.6-4.3	3.3-4.0	3.0-3.6	2.3-3.0	2.0-2.6	1.6-2.3	1.3-2.0	1.0-1.6	33
34	6.5-7.1	5.4-6.1	5.1-5.8	4.8-5.4	4.4-5.1	3.7-4.4	3.4-4.1	3.1-3.7	2.4-3.1	2.0-2.7	1.7-2.4	1.4-2.0	1.0-1.7	34
35	6.6-7.3	5.6-6.3	5.2-5.9	4.9-5.6	4.5-5.2	3.8-4.5	3.5-4.2	3.1-3.8	2.4-3.1	2.1-2.8	1.7-2.4	1.4-2.1	1.0-1.7	35
36	6.8-7.6	5.8-6.5	5.4-6.1	5.0-5.8	4.7-5.4	4.0-4.7	3.6-4.3	3.2-4.0	2.5-3.2	2.2-2.9	1.8-2.5	1.4-2.2	1.1-1.8	36
37	7.0-7.8	5.9-6.7	5.5-6.3	5.2-5.9	4.8-5.5	4.1-4.8	3.7-4.4	3.3-4.1	2.6-3.3	2.2-3.0	1.8-2.6	1.5-2.2	1.1-1.8	37
38	7.2-7.9	6.1-6.8	5.7-6.5	5.3-6.1	4.9-5.7	4.2-4.9	3.8-4.6	3.4-4.2	2.7-3.4	2.3-3.0	1.9-2.7	1.5-2.3	1.1-1.9	38
39	7.4-8.2	6.2-7.0	5.8-6.6	5.5-6.2	5.1-5.8	4.3-5.1	3.9-4.7	3.5-4.3	2.7-3.5	2.3-3.1	1.9-2.7	1.6-2.3	1.2-1.9	39
40	7.6-8.4	6.4-7.2	6.0-6.8	5.6-6.4	5.2-6.0	4.4-5.2	4.0-4.8	3.6-4.4	2.8-3.6	2.4-3.2	2.0-2.8	1.6-2.4	1.2-2.0	40
41	7.8-8.6	6.6-7.4	6.1-7.0	5.7-6.6	5.3-6.1	4.5-5.3	4.1-4.9	3.7-4.5	2.9-3.7	2.5-3.3	2.0-2.9	1.6-2.5	1.2-2.0	41
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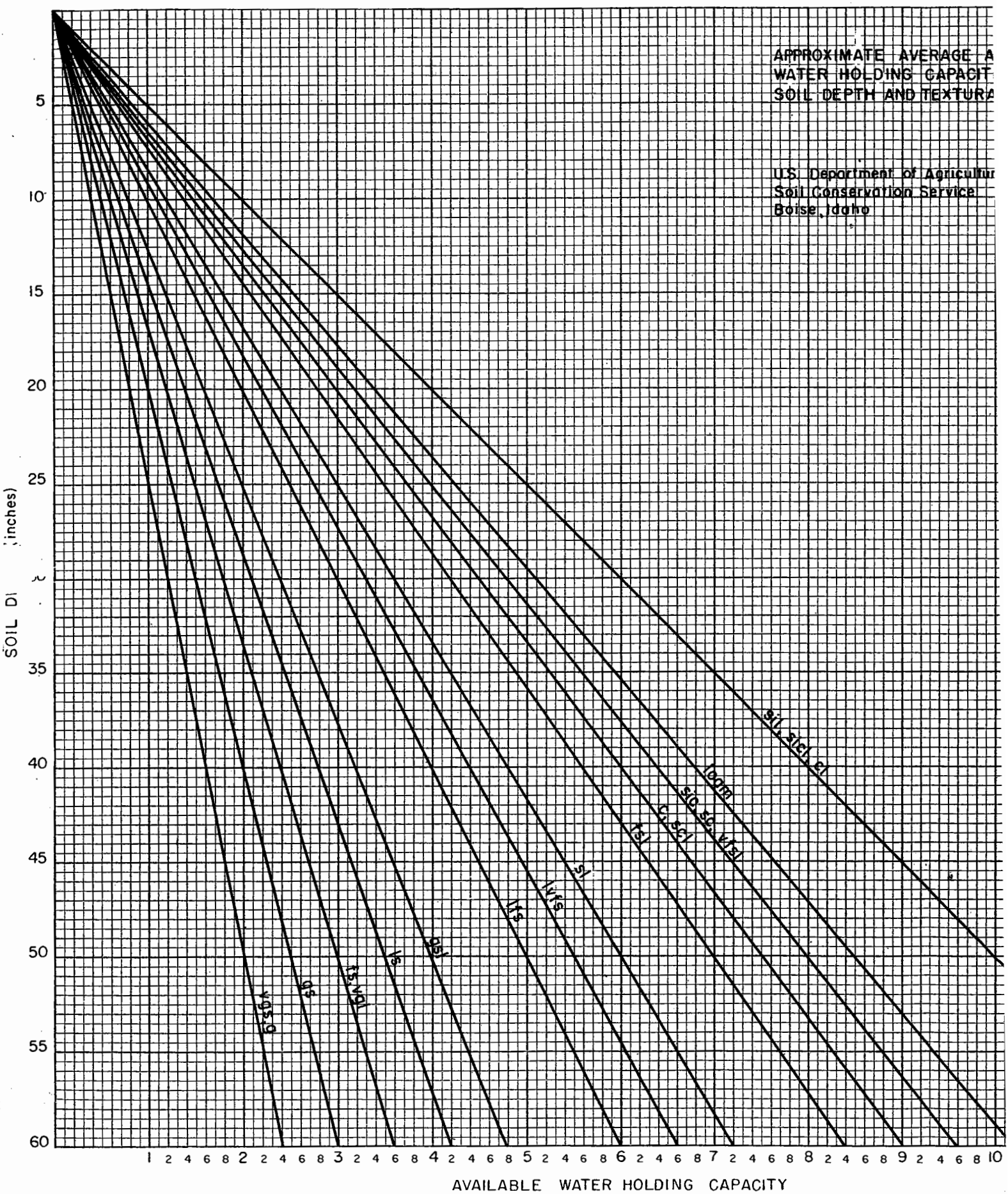
43	8.2-9.0	6.9-7.7	6.4-7.3	6.0-6.9	5.6-6.4	4.7-5.6	4.3-5.2	3.9-4.7	3.0-3.9	2.6-3.4	2.1-3.0	1.7-2.6	1.3-2.1	43
44	8.4-9.2	7.0-7.9	6.6-7.5	6.2-7.0	5.7-6.6	4.8-5.7	4.4-5.3	4.0-4.8	3.1-4.0	2.6-3.5	2.2-3.1	1.8-2.6	1.3-2.2	44
45	8.5-9.4	7.2-8.1	6.7-7.6	6.3-7.2	5.8-6.7	4.9-5.8	4.5-5.4	4.0-4.9	3.1-4.0	2.7-3.6	2.2-3.1	1.8-2.7	1.3-2.2	45
46	8.7-9.7	7.4-8.3	6.9-7.8	6.4-7.4	6.0-6.9	5.1-6.0	4.6-5.5	4.1-5.1	3.2-4.1	2.8-3.7	2.3-3.2	1.8-2.8	1.4-2.3	46
47	8.9-9.9	7.5-8.5	7.0-8.0	6.6-7.5	6.1-7.0	5.2-6.1	4.7-5.6	4.2-5.2	3.3-4.2	2.8-3.8	2.3-3.3	1.9-2.8	1.4-2.3	47
48	9.1-10.1	7.7-8.6	7.2-8.2	6.7-7.7	6.2-7.2	5.3-6.2	4.8-5.8	4.3-5.3	3.4-4.3	2.9-3.8	2.4-3.4	1.9-2.9	1.4-2.4	48
49	9.3-10.2	7.8-8.8	7.3-8.3	6.9-7.8	6.4-7.3	5.4-6.4	4.9-5.9	4.4-5.4	3.4-4.4	2.9-3.9	2.4-3.4	2.0-2.9	1.5-2.4	49
50	9.5-10.5	8.0-9.0	7.5-8.5	7.0-8.0	6.5-7.5	5.5-6.5	5.0-6.0	4.5-5.5	3.5-4.5	3.0-4.0	2.5-3.5	2.0-3.0	1.5-2.5	50
51	9.7-10.7	8.2-9.2	7.6-8.7	7.1-8.2	6.6-7.6	5.6-6.6	5.1 6.1	4.6-5.6	3.6-4.6	3.1-4.1	2.5-3.6	2.0-3.1	1.5-2.5	51
52	9.9-10.9	8.3-9.4	7.8-8.8	7.3-8.3	6.8-7.8	5.7-6.8	5.2-6.2	4.7-5.7	3.6-4.7	3.1-4.2	2.6-3.6	2.1-3.1	1.6-2.6	52
53	10.1-11.1	8.5-9.5	7.9-9.0	7.4-8.5	6.9-7.9	5.8-6.9	5.3-6.4	4.8-5.8	3.7-4.8	3.2-4.2	2.6-3.7	2.1-3.2	1.6-2.6	53
54	10.3-11.3	8.6-9.7	8.1-9.2	7.6-8.6	7.0-8.1	5.9-7.0	5.4-6.5	4.9-5.9	3.8-4.9	3.2-4.3	2.7-3.8	2.2-3.2	1.6-2.7	54
55	10.4-11.5	8.8-9.9	8.2-9.3	7.7-8.8	7.1-8.2	6.0-7.1	5.5-6.6	4.9-6.0	3.8-4.9	3.3-4.4	2.7-3.8	2.2-3.3	1.6-2.7	55
56	10.6-11.8	9.0-10.1	8.4-9.5	7.8-9.0	7.3-8.4	6.2-7.3	5.6-6.7	5.0-6.2	3.9-5.0	3.4-4.5	2.8-3.9	2.2-3.4	1.7-2.8	56
57	10.8-12.0	9.1-10.3	8.5-9.7	8.0-9.1	7.4-8.5	6.3-7.4	5.7-6.8	5.1-6.3	4.0-5.1	3.4-4.6	2.8-4.0	2.3-3.4	1.7-2.8	57
58	11.0-12.2	9.3-10.4	8.7-9.9	8.1-9.3	7.5-8.7	6.4-7.5	5.8-7.0	5.2-6.4	4.1-5.2	3.5-4.6	2.9-4.1	2.3-3.5	1.7-2.9	58
59	11.2-12.4	9.4-10.6	8.8-10.0	8.3-9.4	7.7-8.8	6.5-7.7	5.9-7.1	5.3-6.5	4.1-5.3	3.5-4.7	2.9-4.1	2.4-3.5	1.8-2.9	59
60	11.4-12.6	9.6-10.8	9.0-10.2	8.4-9.6	7.8-9.0	6.6-7.8	6.0-7.2	5.4-6.6	4.2-5.4	3.6-4.8	3.0-4.2	2.4-3.6	1.8-3.0	60

Basic assumption: <1% organic matter, mixed and montmorillonite clays predominate; bulk density 1.5, 1/3 coarse fragments reduce AWC by 1/4.

U. S. DEPARTMENT OF AGRICULTURE



USDA-SCS-PORTLAND, OREG. 1971