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Woodlot table thanks to an Excel spreadsheet on the ruler. Most of the numbers that were featured on the side marked “Ontario” (top, bottom, middle, and big) followed the same pattern as the calculations on the Volume table, and our group thinks that part of the ruler follows the same Ontario Logging Rule as many forest industries have followed as well.

The first thing we thought to do was research. None of us had ever seen anything like this before, so we turned to Google to figure out what was going on. Based off of the writing on the end of Dave’s ruler, it is made from Lufkin rule company of Canada LTD in Barrie, Ontario. The company was founded in 1869 by an American Civil War veteran named Edward Taylor Lufkin in Cleveland, Ohio. The company closed in 1968 after a short union strike. It’s Canada-based plant was in Barrie, Ontario. The other plant was based in Saginaw, Michigan. The closest model of Dave’s ruler is the US 272279, “Headed Lumber Rule,” which was patented by Lufkin on February 13, 1883. This was one of three models that was patented by Lufkin. Lufkin is a brand of Apex Tool Group primarily measurement tools such as measuring tapes, gauges, calipers, and micrometers. From this, we determined that the stick was a logging rule stick: “forest industries to use and measure the volume of a sawlog in FBM(Board Feet) prior to processing... One board foot measures 1 inch by 12 inches by 12 inches” (Ontario Woodlot). But, there are many methods used to determine how many FBM comes from a log, so which one was it modeled after? We looked at a few of the most common ones: Ontario, International, Doyle, Scribner, and Brereton.

Given the “ONTARIO” carved into the stick on one side, we pretty much immediately ruled that that side was used for the Ontario Scale. And it lines up: the top-most and bottom-most numbers on the “ONTARIO” side of the stick line up completely with Ontario Woodlot’s

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Woodland notes (shown below, black and white), and our own calculations of expected FBM.

Furthermore, they correlate with a 14-foot and 16-foot log, respectively, at diameters 4-30.

Weirdly enough, we then were able to find that the top-most and bottom-most numbers also are using the Ontario log scale, but for 10 ft and 12 ft, respectively. So it turns out, by sheer dumb luck, we found the answer to half the problem.

The other 4 numbers are not nearly as neat as those 4. We were hoping they would line up in the same way with another method, but no such luck. So, we picked the closest, knowing full and well that it's probably not right, but it's our best guess. After comparing the numbers for 6-, 8-, 10-, 12-, 14-, and 16-foot logs to Doyle's, International 1/4, International 1/8, Scribner, and Brereton log rule techniques, we decided that Scribner was closest on the "other" side, and International 1/8 was closest on the "ONTARIO" side. We could have used a regression to determine which was mathematically closest and proven it, but we were pretty satisfied with how close it was when compared with the others.

Table: 1 Volume Table (Ontario Rule) Volume in Board Feet					
Diameter in Inches Inside Bark at Small End of Log	Length of Log (in feet)				
	8'	10'	12'	14'	16'
4	3	3	4	5	5
5	5	6	8	9	10
6	8	10	13	15	17
7	12	15	19	22	25
8	17	21	26	30	34
9	22	28	34	39	45
10	29	36	43	50	57
11	36	44	53	62	71
12	43	54	65	76	86
13	52	64	77	90	103
14	61	76	91	106	121
15	70	88	106	123	141
16	81	101	123	145	163

Ontario Woodlot's Woodland Notes Ontario Rule converter. It gave us our first big "aha!" moment when we realized the numbers matched.

The numbers from the very top and bottoms of both sides of the stick, as well as the results of calculating the Ontario expected FBM. Diameter=big numbers on stick.

diameter(in)	"Ontario" top	formula, L=14	"Ontario" bottom	formula, L=16	diameter(in)	formula, L=12	other bottom	formula, L=10	other top
4	5	5	C/R	6	4	4	4	4	5
5	9	10	C/R	11	5	8	8	7	8
6	15	15	C/R	17	6	13	13	11	10
7	22	22	25	25	7	19	19	16	C/R
8	30	30	34	35	8	26	26	22	C/R
9	39	40	C/R	45	9	34	34	29	C/R
10	50	51	57	58	10	43	43	36	C/R

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11	62	63	71	72	11	54	53	45	C/R
12	76	76	88	87	12	65	65	54	C/R
13	90	91	C/R	104	13	78	77	65	C/R
14	106	107	C/R	122	14	91	91	76	C/R
15	123	124	C/R	141	15	106	106	89	C/R
16	142	142	C/R	163	16	122	122	102	C/R
17	152	162	C/R	185	17	139	139	116	C/R
18	168	183	209	209	18	157	157	131	C/R
19	205	206	234	235	19	176	178	147	140
20	229	229	261	262	20	196	196	164	C/R
21	254	254	290	290	21	218	217	182	181
22	280	280	320	320	22	240	240	200	C/R
23	307	308	351	352	23	264	263	220	219
24	336	336	384	384	24	288	288	240	240
25	368	367	418	419	25	314	314	262	C/R
26	397	398	454	455	26	341	341	284	C/R
27	430	430	495	492	27	369	369	308	307
28	464	464	530	531	28	398	398	332	C/R
29	489	500	570	571	29	428	428	357	356
30	536	536	612	612	30	459	459	383	382

The numbers from the “other” side small, between the diameter markings, and the Scribner FBM values for logs of 14’ and 16’.

diameter(in)	formula, L=14	other bottom	formula, L=16	other top
4	1		1	

5	6	6	6	5
6	11	10	13	8
7	19	15	21	13
8	27	22	31	C/R
9	37	30	42	25
10	49	38	55	32
11	61	48	70	40
12	76	59	86	49
13	91	71	104	59
14	108	84	123	70
15	126	98	144	82
16	146	114	167	95
17	167	130	191	108
18	189	147	216	123
19	213	166	244	138

The numbers from the in-between numbers on the Ontario side of the stick compared to the International $\frac{1}{8}$ logging rule for log length of 16' and 12'. I could not find a formula for $\frac{1}{8}$ logging rule, but I did find a calculator but it only rounded to the nearest 5th. This is definitely the loosest of "best".

diameter(in)	L=16	"Ontario" top	L=12	"Ontario" bottom
4	10	7	5	8
5	15	12	10	13
6	25	18	15	21

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7	35	26	25	29
8	45	31	30	39
9	60	45	40	51
10	75	56	55	61
11	90	69	65	79
12	110	83	80	95
13	130	98	95	112
14	150	110	110	131
15	175	132	130	151
16	200	152	145	173
17	230	172	165	197
18	260	194	190	221
19	290	217	210	240

Sources

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