

Estimating Weight of Giant Pumpkins and Squash

January 2005

The last update was dated January 2003 based on 800 measurements from 2001 and 2002. I compared data for 1203 fruit grown in 2003 and 2004 with the 2001 and 2002 data. Fruit grown the last 2 years are heavier for the same size by approximately 3%. Therefore the equations used for the tables dated January 2005 are primarily based on 1203 fruit grown in 2003 and 2004. Most of the data was provided from the **AGGC** file by Mike Nepereny. The tables provide estimates for fruit down to 41 inch Circumference (approx. 30 pounds) and 91 inches Over-the-Top (approx. 21 pounds).

David Martin from Little Britain, Ontario used Multiple Regression Analysis to obtain equations that best fit the data I provided. He prepared the Weight Tables from those equations.

The **OVER-THE-TOP** method (TABLE 1) provides the **BEST** estimates but only about 76% will be within plus or minus 10%. This requires adding Circumference to the two Over-the-Top measurements taken from ground-to-ground from side-to-side and end-to-end.

TABLE 2 uses only the **CIRCUMFERENCE** measurement. It **DOES NOT** provide good estimates for unusually high, flat, long or short fruit. About 54% of the estimates will be within plus or minus 10%. It is useful to estimate day-to-day increases.

The Circumference measurement should be the **LARGEST** circumference taken **approximately** parallel to the ground. At weigh-offs I have found some growers are not measuring the largest Circumference which contributes to the variability. The **OVER-TOP** measurements from ground-to-ground in both directions must be over the **highest** point of the fruit. These must be taken straight down from the edges of the fruit.

EXAMPLE: Circumference = 175 inches (Table 2 estimate = 1185 pounds)
Side-to-side = 103 inches
End-to-end = 100 inches
Total = 378 inches (Table 1 estimate = 1130 pounds)
Actual weight was 1121 pounds.

Due to considerable variability in the “wall thickness” from fruit-to-fruit, neither method provides very reliable estimates but at present we don’t have a better method. Here are the percents of your estimates that you can expect to be within the accuracy ranges shown (based on fruit grown in 2003 and 2004):

<u>Accuracy range</u>	<u>Table 1 (O.T.)</u>	<u>Table 2 (C)</u>
± 5 %	48.5 %	30.2%
± 5.01 to ± 10%	27.3%	24.0%
± 10.01 % to ± 15 %	16.3%	19.6%
Over ± 15.01%	7.9%	26.2%

NEW Tables compared to January 2003 Tables:

The new tables should provide better estimates as **AVERAGE** fruit weight for the same measurement increased approximately 3% compared to 2001 and 2002 weights. The Circumference table should be much better at the higher weights as the previous table over-estimated above approximately 170 inch Circumference.

I will provide David Martin’s equations (4 terms) to anyone who wants to use them in a computer program. Write me at 1925 Middle Road, Rush, NY 14543-9732.

I have provided Tables to estimate weights since 1988. They were updated every 2 to 3 years. This is my **LAST** update. For the last 3 updates I thank David Martin for using the data I provided to obtain the equations and preparing the Tables. Thank you to all the growers who provided me with measurements since 1987 and to Mike Nepereny for providing data from his AGGC file the last 4 years.

NOTE: Several people have attempted to obtain Weight Estimating equations using the RAW data available. All, that I know of, obtained equations that over-estimated below approximately 750 pounds and under-estimated above that due to a **BIAS** in the data. If anyone is interested, I will explain how I worked around the bias.

Leonard B. Stellpflug

Table 1: Over-the-Top Inches vs. Estimated Weight

Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.		
91	22.6	121	46.6	151	83	181	136	211	208	241	303	271	425	301	577	331	763	361	986	391	1249
92	23.2	122	47.6	152	85	182	138	212	211	242	307	272	430	302	583	332	770	362	994	392	1259
93	23.8	123	48.6	153	86	183	140	213	214	243	310	273	434	303	588	333	777	363	1002	393	1269
94	24.5	124	49.6	154	88	184	142	214	216	244	314	274	439	304	594	334	783	364	1010	394	1278
95	25.2	125	50.7	155	89	185	144	215	219	245	318	275	444	305	600	335	790	365	1019	395	1288
96	25.8	126	51.7	156	91	186	146	216	222	246	322	276	448	306	606	336	797	366	1027	396	1298
97	26.5	127	52.8	157	92	187	149	217	225	247	325	277	453	307	611	337	804	367	1035	397	1307
98	27.2	128	53.9	158	94	188	151	218	228	248	329	278	458	308	617	338	811	368	1044	398	1317
99	27.9	129	55.0	159	95	189	153	219	231	249	333	279	463	309	623	339	819	369	1052	399	1327
100	28.7	130	56.1	160	97	190	155	220	234	250	337	280	467	310	629	340	826	370	1060	400	1337
101	29.4	131	57.2	161	99	191	157	221	237	251	341	281	472	311	635	341	833	371	1069	401	1347
102	30.1	132	58.3	162	100	192	160	222	240	252	345	282	477	312	641	342	840	372	1078	402	1357
103	30.9	133	59.5	163	102	193	162	223	243	253	349	283	482	313	647	343	847	373	1086	403	1367
104	31.7	134	60.7	164	104	194	164	224	246	254	353	284	487	314	653	344	855	374	1095	404	1377
105	32.4	135	61.9	165	105	195	167	225	249	255	357	285	492	315	659	345	862	375	1104	405	1387
106	33.2	136	63.1	166	107	196	169	226	252	256	361	286	497	316	666	346	869	376	1112	406	1398
107	34.0	137	64.3	167	109	197	172	227	256	257	365	287	502	317	672	347	877	377	1121	407	1408
108	34.8	138	65.5	168	111	198	174	228	259	258	369	288	507	318	678	348	884	378	1130	408	1418
109	35.7	139	66.8	169	113	199	176	229	262	259	373	289	512	319	684	349	892	379	1139	409	1429
110	36.5	140	68.1	170	114	200	179	230	265	260	377	290	518	320	691	350	900	380	1148	410	1439
111	37.4	141	69.3	171	116	201	181	231	269	261	381	291	523	321	697	351	907	381	1157	411	1450
112	38.2	142	70.6	172	118	202	184	232	272	262	386	292	528	322	703	352	915	382	1166	412	1460
113	39.1	143	72.0	173	120	203	187	233	275	263	390	293	533	323	710	353	923	383	1175	413	1471
114	40.0	144	73.3	174	122	204	189	234	279	264	394	294	539	324	716	354	930	384	1184	414	1481
115	40.9	145	74.7	175	124	205	192	235	282	265	398	295	544	325	723	355	938	385	1193	415	1492
116	41.8	146	76.0	176	126	206	194	236	286	266	403	296	550	326	729	356	946	386	1202	416	1503
117	42.7	147	77.4	177	128	207	197	237	289	267	407	297	555	327	736	357	954	387	1212	417	1514
118	43.7	148	78.8	178	130	208	200	238	293	268	412	298	560	328	743	358	962	388	1221	418	1524
119	44.6	149	80.2	179	132	209	202	239	296	269	416	299	566	329	749	359	970	389	1230	419	1535
120	45.6	150	81.68	180	134	210	205	240	300	270	421	300	572	330	756	360	978	390	1240	420	1546

Table 2: Circumference vs. Estimated Weight

Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.	Inches	Lbs.
41	29.7	61	78.9	81	160	101	280	121	448	141	669	161	948	181	1300
42	31.5	62	82.1	82	165	102	288	122	458	142	681	162	963	182	1319
43	33.4	63	85.5	83	170	103	295	123	468	143	694	163	979	183	1339
44	35.3	64	88.8	84	175	104	302	124	478	144	707	164	995	184	1360
45	37.3	65	92.3	85	181	105	310	125	489	145	719	165	1012	185	1380
46	39.4	66	95.9	86	186	106	318	126	499	146	732	166	1028	186	1401
47	41.6	67	99.5	87	192	107	325	127	509	147	746	167	1045	187	1422
48	43.8	68	103.3	88	197	108	333	128	520	148	759	168	1062	188	1443
49	46.0	69	107.1	89	203	109	341	129	531	149	772	169	1079	189	1464
50	48.4	70	111.0	90	209	110	349	130	541	150	786	170	1096	190	1486
51	50.8	71	115.0	91	215	111	358	131	552	151	800	171	1114	191	1508
52	53.3	72	119.0	92	221	112	366	132	563	152	814	172	1131	192	1530
53	55.8	73	123.2	93	227	113	375	133	575	153	828	173	1149	193	1552
54	58.4	74	127.5	94	233	114	383	134	586	154	842	174	1167	194	1575
55	61.1	75	131.8	95	240	115	392	135	597	155	857	175	1185	195	1597
56	63.9	76	136.3	96	246	116	401	136	609	156	872	176	1204	196	1621
57	66.8	77	140.8	97	253	117	410	137	621	157	886	177	1223	197	1644
58	69.7	78	145.4	98	259	118	419	138	632	158	901	178	1242	198	1667
59	72.7	79	150.2	99	266	119	429	139	644	159	917	179	1261	199	1691
60	75.8	80	155.0	100	273	120	438	140	657	160	932	180	1280	200	1715

2005
 Tables prepared
 by
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 from equations
 obtained primarily from 2003 and
 2004 data provided from AGGC file
 to Len Stellpflug

 January 2005

 David Martin

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