



The Relationship Between Berry Weight, Length, and Width for Five Table Grape Varieties

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Researchers routinely measure berry weight when evaluating the effect of a cultural practice or pest management strategy on fruit development. Berry weight is easy to determine: a sample of one to two hundred berries is randomly collected per plot, counted, weighed, and then berry weight is reported as grams per berry.

However, growers, fruit brokers, and retailers usually characterize berries by diameter or length rather than berry weight. For example, they would describe a box of Thompson Seedless as having berries mostly 11/16 inch in diameter rather than as having mostly 5 gram berries. There is a strong linear correlation between berry weight, diameter, and length. [Tables 1 to 5](#) give berry weight and corresponding values for berry diameter and length for Flame Seedless, Thompson Seedless, Red Globe, Fantasy Seedless, and Crimson Seedless. Also given is the number of berries per pound for different berry weights.

Berry weight and size are affected by numerous factors including gibberellin, girdling, soil type, irrigation, rootstock and the weather. The average berry weight of Flame Seedless, Thompson Seedless, and Crimson Seedless ranges from 4 to 6 grams. Fantasy Seedless berries are larger ranging from 6 to 8 grams, and Red Globe berries are 10 to 13 grams.

The berry shape of these five varieties varies from round to cylindroidal. Flame Seedless is round with berry diameter the same as berry length. The Red Globe berry is almost round but berry length is slightly greater than diameter. Thompson Seedless table grapes, Fantasy Seedless, and Crimson Seedless have elongated berries.

Cultural practices that increase berry diameter result in a significant increase in berry weight and yield. [Table 6](#) summarizes theoretical yield response to an increase in berry diameter.

Table 1. The relationship between berry weight, diameter, and length for Flame Seedless at harvest.

Berry Weight (Gms)	Number of Berries per Pound	Berry Diameter ^{1/}		Berry Length ^{2/}	
		Inches	& (mm)	Inches	& (mm)
3.5	129	11/16	(17)	11/16	(17)
^{3/} 4.5	101	12/16	(19)	12/16	(19)
5.3	86	13/16	(20)	13/16	(20)
6.5	70	14/16	(22)	14/16	(22)
7.6	60	15/16	(23)	15/16	(23)

^{1/}The linear equation for berry weight and berry diameter is: berry diameter (mm) = 12.0 + 1.5 x berry weight (g).

^{2/}The linear equation for berry weight and berry length is: berry length (mm) = 13.5 + 1.2 x berry weight (g).

^{3/}The average berry weight for Flame Seedless usually ranges from 4 to 6 grams.

Table 2. The relationship between berry weight, diameter, and length for Thompson Seedless at harvest.

Berry Weight (Gms)	Number of Berries per Pound	Berry Diameter ^{1/}		Berry Length ^{2/}	
		Inches	& (mm)	Inches	& (mm)
2.8	162	9/16	(14)	14/16	(22)
^{3/} 4.0	113	10/16	(16)	15/16	(23)
5.1	89	11/16	(17)	16/16	(25)
6.2	73	12/16	(19)	17/16	(27)
7.3	62	13/16	(20)	18/16	(28)

^{1/}The linear equation for berry weight and berry diameter is: berry diameter (mm) = 10 + 1.4 x berry weight (g).

^{2/}The linear equation for berry weight and berry length is: berry length (mm) = 18.5 + 1.3 x berry weight (g).

^{3/}The average berry weight for Thompson Seedless table grapes usually ranges from 4 to 6 grams.

Table 3. The relationship between berry weight, diameter, and length for Red Globe at harvest.

Berry Weight (Gms)	Number of Berries per Pound	Berry Diameter ^{1/}		Berry Length ^{2/}	
		Inches	& (mm)	Inches	& (mm)
8.1	56	14/16	(22)	15/16	(24)
^{3/} 9.5	48	15/16	(23)	16/16	(25)
10.9	42	16/16	(25)	17/16	(27)
12.4	37	17/16	(27)	18/16	(28)
13.8	33	18/16	(28)	19/16	(30)

^{1/}The linear equation for berry weight and berry diameter is: berry diameter (mm) = 12.9 + 1.1 x berry weight (g).

^{2/}The linear equation for berry weight and berry length is: berry length (mm) = 16.0 + 1.0 x berry weight (g).

^{3/}The average berry weight for Red Globe usually ranges from 10 to 13 gms.

Table 4. The relationship between berry weight, diameter, and length for Crimson Seedless at harvest.

Berry Weight (Gms)	Number of Berries per Pound	Berry Diameter ^{1/}		Berry Length ^{2/}	
		Inches	& (mm)	Inches	& (mm)
2.4	189	9/16	(14)	13/16	(20)
^{3/} 3.7	123	10/16	(16)	14/16	(22)
4.9	93	11/16	(17)	15/16	(23)
6.1	74	12/16	(19)	16/16	(25)
7.4	61	13/16	(20)	17/16	(27)

^{1/}The linear equation for berry weight and berry diameter is: berry diameter (mm) = 11 + 1.25 x berry weight (g).

^{2/}The linear equation for berry weight and berry length is: berry length (mm) = 14.6 + 1.85 x berry weight (g).

^{3/}The average berry weight for Crimson Seedless usually ranges from 4 to 6 grams.

Table 5. The relationship between berry weight, diameter and length for Fantasy Seedless at harvest.

Berry Weight (Gms)	Number of Berries per Pound	Berry Diameter ^{1/}		Berry Length ^{2/}	
		Inches	& (mm)	Inches	& (mm)
4.5	101	11/16	(17)	15/16	(23)
^{3/} 5.5	83	12/16	(19)	16/16	(25)
6.6	69	13/16	(20)	17/16	(27)
7.7	59	14/16	(22)	18/16	(28)
8.8	52	15/16	(23)	19/16	(30)

^{1/}The linear equation for berry weight and berry diameter is: berry diameter (mm) = 11.0 + 1.4 x berry weight (g).

^{2/}The linear equation for berry weight and berry length is: berry length (mm) = 15.8 + 1.64 x berry weight (g).

^{3/}The average berry weight for Fantasy Seedless usually ranges from 6 to 8 gm.

Table 6. Yield response to an increase in average berry diameter.

Variety	Increase in Berry Diameter (Inches)		Berry Weight and Yield Increase (%)
	From	To	
Flame Seedless (Table 1)	12/16	14/16	44
Thompson Seedless (Table 2)	10/16	12/16	55
Red Globe (Table 3)	15/16	17/16	31
Crimson Seedless (Table 4)	10/16	12/16	64
Fantasy Seedless (Table 5)	12/16	14/16	40