



# SBIP QUEEN SCORE

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Siouxland Bee Improvement Project

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	Queen ID										
	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE		
2	JA118-001	09/2018	16	10	-2	0	0	24	3.2101		
3	JA118-002	09/2018	14	9	-4	0	0	19	0.1242		
4	JA118-003	09/2018	15	9	-6	0	0	18	0.5014		
5	JA118-004	09/2018	16	8	-6	0	0	18	1.1068		
6	JA118-005	09/2018	16	5	-8	0	0	13	-0.7683		
7	JA118-006	09/2018	14	4	-11	0	0	7	-4.1741		
8											
9											
10											

The Queen Score sheet has gone through several versions. This is one of the earlier versions. It has categories like Number of frames, Pounds of honey harvested, number of mites in negative. All of these categories get added together to give each queen or hive a score. We hope to use these scores to identify the queens that have traits we want to expand on in the program.



Queen ID											
	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE		
2	JA118-001	09/2018	16	10	-2	0	0	24	3.2101		
3	JA118-002	09/2018	14	9	-4	0	0	19	0.1242		
4	JA118-003	09/2018	15	9	-6	0	0	18	0.5014		
5	JA118-004	09/2018	16	8	-6	0	0	18	1.1068		
6	JA118-005	09/2018	16	5	-8	0	0	13	-0.7683		
7	JA118-006	09/2018	14	4	-11	0	0	7	-4.1741		
8											
9											
10											

The first issue I had with the Queen Score is that not all categories are easy to compare to each other. They are not apples to apples comparisons. At the Annual meeting one of the speakers introduced us to Z-Scores. Z-scores can help with the apples to oranges problem.



	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE		
2	JA118-001	09/2018	16	10	-2	0	0	24	3.2101		
3	JA118-002	09/2018	14	9	-4	0	0	19	0.1242		
4	JA118-003	09/2018	15	9	-6	0	0	18	0.5014		
5	JA118-004	09/2018	16	8	-6	0	0	18	1.1068		
6	JA118-005	09/2018	16	5	-8	0	0	13	-0.7683		
7	JA118-006	09/2018	14	4	-11	0	0	7	-4.1741		
8											
9											
10											
11		AVERAGE	15.16666667	7.5	-6.166666667	0	0				
12		STD DEVEATION	0.9831920803	2.42899156	3.125166662	0	0				
13											
14		Z-Score = value - Average / Standard Deviation									

You don't need to know this, but the Z-Score is calculated by taking the value entered and subtracting the average of all the values then dividing by the standard deviation of all the values. What it tells you for each value is how many standard deviations it is from the mean (average), either plus or minus.



	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE		
2	JA118-001	09/2018	16	10	-2	0	0	24	3.2101		
3	JA118-002	09/2018	14	9	-4	0	0	19	0.1242		
4	JA118-003	09/2018	15	9	-6	0	0	18	0.5014		
5	JA118-004	09/2018	16	8	-6	0	0	18	1.1068		
6	JA118-005	09/2018	16	5	-8	0	0	13	-0.7683		
7	JA118-006	09/2018	14	4	-11	0	0	7	-4.1741		
8											
9											
10											
11		AVERAGE	15.16666667	7.5	-6.166666667	0	0				
12		STD DEVEATION	0.9831920803	2.42899156	3.125166662	0	0				
13											
14		Z-Score = value - Average / Standard Deviation									

The highlighted cells above show that hives 3 and 4 have very similar entries and an identical Queen Score. But hive 4 has a higher Z-Score. Pounds of honey are recorded in 10 pound increments. So 90 pounds would be recorded as 9.



	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE		
2	JA118-001	09/2018	16	10	-2	0	0	24	3.2101		
3	JA118-002	09/2018	14	9	-4	0	0	19	0.1242		
4	JA118-003	09/2018	15	9	-6	0	0	18	0.5014		
5	JA118-004	09/2018	16	8	-6	0	0	18	1.1068		
6	JA118-005	09/2018	16	5	-8	0	0	13	-0.7683		
7	JA118-006	09/2018	14	4	-11	0	0	7	-4.1741		
8											
9											
10											
11		AVERAGE	15.16666667	7.5	-6.166666667	0	0				
12		STD DEVEATION	0.9831920803	2.42899156	3.125166662	0	0				
13											
14		Z-Score = value - Average / Standard Deviation									

Hive 4 had 10 fewer pounds of honey, 8 compared to 9. But hive 4 also had one more frame of bees, 16 compared to 15. One frame of honey is close to one whole standard deviation. 10 pounds of honey is less than half a standard deviation. So the additional frame of honey gave hive 4 more points in the Z-Score than the 10 pounds less honey subtracted.



	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE		
2	JA118-001	09/2018	16	10	-2	0	0	24	3.2101		
3	JA118-002	09/2018	14	9	-4	0	0	19	0.1242		
4	JA118-003	09/2018	15	9	-6	0	0	18	0.5014		
5	JA118-004	09/2018	16	8	-6	0	0	18	1.1068		
6	JA118-005	09/2018	16	5	-8	0	0	13	-0.7683		
7	JA118-006	09/2018	14	4	-11	0	0	7	-4.1741		
8											
9											
10											
11		AVERAGE	15.16666667	7.5	-6.166666667	0	0				
12		STD DEVEATIOI	0.9831920803	2.42899156	3.125166662	0	0				
13											
14		Z-Score = value - Average / Standard Deviation									

This helps lessen the apples to oranges problem. A different group of hives with different scores will have different results. The Z-Scores help within each group of hives.



	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:		? Z-SCORE	
2	JA118-001	09/2018	18	6	-2	0	0	22		3.4891	
3	JA118-002	09/2018	18	6	-4	0	0	20		2.4201	
4	JA118-003	09/2018	18	6	-6	0	0	18		1.3510	
5	JA118-004	09/2018	18	6	-8	0	0	16		0.2820	
6	JA118-005	09/2018	18	6	-10	0	0	14		-0.7871	
7	JA118-006	09/2018	17	5	-12	0	0	10		-6.7551	
8											
9											
10											
11		AVERAGE	17.83333333	5.833333333	-7	0	0				
12		STD DEVEATION	0.4082482905	0.4082482905	3.741657387	0	0				
13											

In this group of hives all of the categories are very similar except for the mite counts. If you sorted by the Queen Score or the Z-Score these hives would end up in the same order.





	A	B	C	D	E	F	G	H	I	J	K
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:		? Z-SCORE	
2	JA118-001	09/2019	18	6	-2	0	0	22		3.6785	
3	JA118-002	09/2018	18	6	-4	0	0	20		2.6094	
4	JA118-003	09/2018	18	4	-6	0	0	16		-0.8501	
5	JA118-004	09/2019	18	6	-8	0	0	16		0.4713	
6	JA118-005	09/2018	18	6	-10	0	0	14		-0.5977	
7	JA118-006	09/2018	17	5	-12	0	0	10		-5.3115	
8											
9											
10											
11		AVERAGE	17.83333333	5.5	-7	0	0				
12		STD DEVEATION	0.4082482905	0.8366600265	3.741657387	0	0				
13											

In this group of hives hive 3 under produced in the honey category. It was 1.5 pounds under the average. So it gets the same queen score as hive 4. But the Z-Score shows hive 3 is below hive 4, even though hive 4 had 2 more mites. In this group, 2 mites were not as big of a deviation as 20 pounds of honey was.



	A	B	C	D	E	F	G	H	I	J
1	1	2	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE	
2	A1		18	5	-2	0	0	21	3.4891	
3	A2		18	5	-4	0	0	19	2.4201	
4	A3		18	5	-6	0	0	17	1.3510	
5	A4		18	5	-8	0	0	15	0.2820	
6	A5		18	5	-10	0	0	13	-0.7871	
7	A6		17	4	-12	0	0	9	-6.7551	
8										
9	B1		18	10	-2	0	0	26	3.4891	
10	B2		18	10	-4	0	0	24	2.4201	
11	B3		18	10	-6	0	0	22	1.3510	
12	B4		18	10	-8	0	0	20	0.2820	
13	B5		18	10	-10	0	0	18	-0.7871	
14	B6		17	8	-12	0	0	13	-6.7551	
15				A Queen Score	B Queen Score		A Z-SCORE	B Z-SCORE		
16	1			21	26		3.4891	3.4891		
17	2			19	24		2.4201	2.4201		
18	3			17	22		1.3510	1.3510		
19	4			15	20		0.2820	0.2820		
20	5			13	18		-0.7871	-0.7871		
21	6			9	13		-6.7551	-6.7551		
22										
23			17.83333333	4.833333333	-7	0	0			
24			0.4082482905	0.4082482905	3.741657387	0	0			
25										
26			17.83333333	9.666666667	-7	0	0			
27			0.4082482905	0.8164965809	3.741657387	0	0			

The next issue is how to minimize variations between locations or variations between beekeepers. What if my bees are really good at fighting mites but my bee yard is located in an area where the honey crop failed this year?



	A	B	C	D	E	F	G	H	I	J
1			Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:		Z-SCORE
2	A1		18	5	-2	0	0	21		3.4891
3	A2		18	5	-4	0	0	19		2.4201
4	A3		18	5	-6	0	0	17		1.3510
5	A4		18	5	-8	0	0	15		0.2820
6	A5		18	5	-10	0	0	13		-0.7871
7	A6		17	4	-12	0	0	9		-6.7551
9	B1		18	10	-2	0	0	26		3.4891
10	B2		18	10	-4	0	0	24		2.4201
11	B3		18	10	-6	0	0	22		1.3510
12	B4		18	10	-8	0	0	20		0.2820
13	B5		18	10	-10	0	0	18		-0.7871
14	B6		17	8	-12	0	0	13		-6.7551
15			A Queen Score		B Queen Score		A Z-SCORE		B Z-SCORE	
16	1			21	26		3.4891	3.4891		
17	2			19	24		2.4201	2.4201		
18	3			17	22		1.3510	1.3510		
19	4			15	20		0.2820	0.2820		
20	5			13	18		-0.7871	-0.7871		
21	6			9	13		-6.7551	-6.7551		
22										
23			17.83333333	4.83333333	-7	0	0			
24			0.4082482905	0.4082482905	3.741657387	0	0			
25										
26			17.83333333	9.666666667	-7	0	0			
27			0.4082482905	0.8164965809	3.741657387	0	0			

This slide shows two different bee yards. Yard A did not have a good honey crop this year but yard B did. The Queen Scores for yard A are all lower than yard B even though all the other categories besides honey have the exact same scores.



	A	B	C	D	E	F	G	H	I	J
1			Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:		? Z-SCORE
2	A1		18	5	-2	0	0	21		3.4891
3	A2		18	5	-4	0	0	19		2.4201
4	A3		18	5	-6	0	0	17		1.3510
5	A4		18	5	-8	0	0	15		0.2820
6	A5		18	5	-10	0	0	13		-0.7871
7	A6		17	4	-12	0	0	9		-6.7551
9	B1		18	10	-2	0	0	26		3.4891
10	B2		18	10	-4	0	0	24		2.4201
11	B3		18	10	-6	0	0	22		1.3510
12	B4		18	10	-8	0	0	20		0.2820
13	B5		18	10	-10	0	0	18		-0.7871
14	B6		17	8	-12	0	0	13		-6.7551
15			A Queen Score		B Queen Score		A Z-SCORE		B Z-SCORE	
16	1			21	26		3.4891	3.4891		
17	2			19	24		2.4201	2.4201		
18	3			17	22		1.3510	1.3510		
19	4			15	20		0.2820	0.2820		
20	5			13	18		-0.7871	-0.7871		
21	6			9	13		-6.7551	-6.7551		
22										
23			17.83333333	4.833333333	-7	0	0			
24			0.4082482905	0.4082482905	3.741657387	0	0			
25										
26			17.83333333	9.666666667	-7	0	0			
27			0.4082482905	0.8164965809	3.741657387	0	0			

Now look at the Z-Scores though. In the Z-Scores, yard A scores exactly the same as yard B. The Z-Score formula has eliminated the difference due to location!



	A	B	C	D	E	F	G	H	I	J
1	1	2	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (+1 or 0 or -1 or -2 or -5)	Brood Pattern Score (0 or -2)	Total Queen Score:	? Z-SCORE	
2	A1		18	6	-2	0	0	22	3.4891	
3	A2		18	6	-4	0	0	20	2.4201	
4	A3		18	6	-6	0	0	18	1.3510	
5	A4		18	6	-8	0	0	16	0.2820	
6	A5		18	6	-10	0	0	14	-0.7871	
7	A6		17	5	-12	0	0	10	-6.7551	
8										
9	B1		16	6	-2	0	0	20	3.4891	
10	B2		16	6	-4	0	0	18	2.4201	
11	B3		16	6	-6	0	0	16	1.3510	
12	B4		16	6	-8	0	0	14	0.2820	
13	B5		16	6	-10	0	0	12	-0.7871	
14	B6		15	5	-12	0	0	8	-6.7551	
15				A Queen Score	B Queen Score		A Z-SCORE	B Z-SCORE		
16	1			22	20		3.4891	3.4891		
17	2			20	18		2.4201	2.4201		
18	3			18	16		1.3510	1.3510		
19	4			16	14		0.2820	0.2820		
20	5			14	12		-0.7871	-0.7871		
21	6			10	8		-6.7551	-6.7551		
22										
23										
24			17.83333333	5.833333333	-7	0	0			
25			0.4082482905	0.4082482905	3.741657387	0	0			
26										
27			15.83333333	5.833333333	-7	0	0			
28			0.4082482905	0.4082482905	3.741657387	0	0			

So how about variation between beekeepers? Lets say Beekeeper A is not very good at counting frames of bees. He always over counts frames. Beekeeper B is more accurate and ends up with lowers Queen Scores than beekeeper A. However, the Z-Score formula eliminates this variation also. The Z-Scores are exactly the same again.





	A	B	C	D	E	F	G	H	I	J
1			Number of 1 2 frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:	? Z-SCORE	
2	A1		18	5	-4	0	0	19	2.9838	
3	A2		18	5	-8	0	0	15	2.4059	
4	A3		18	5	-12	0	0	11	1.8279	
5	A4		18	5	-20	0	0	3	0.6720	
6	A5		18	5	-30	0	0	-7	-0.7729	
7	A6		17	4	-40	0	0	-19	-7.1167	
8										
10	B1		16	10	-2	0	0	24	3.4891	
11	B2		16	10	-4	0	0	22	2.4201	
12	B3		16	10	-6	0	0	20	1.3510	
13	B4		16	10	-8	0	0	18	0.2820	
14	B5		16	10	-10	0	0	16	-0.7871	
15	B6		15	8	-12	0	0	11	-6.7551	
16				A Queen Score	B Queen Score		A Z-SCORE	B Z-SCORE		
17	1			19	24		2.9838	3.4891		
18	2			15	22		2.4059	2.4201		
19	3			11	20		1.8279	1.3510		
20	4			3	18		0.6720	0.2820		
21	5			-7	16		-0.7729	-0.7871		
22	6			-19	11		-7.1167	-6.7551		
23										
24			17.83333333	4.833333333	-19	0	0			
25			0.4082482905	0.4082482905	13.84196518	0	0			
26										
27			15.83333333	9.666666667	-7	0	0			
28			0.4082482905	0.8164965809	3.741657387	0	0			

Now lets look at mites. The number of mites counted get entered as a negative score. The same Z-Score logic that eliminated the variation between bee yards will also do the same for average of mites in each bee yard.

	A	B	C	D	E	F	G	H	I	J
1			Number of 1 2 frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:	? Z-SCORE	
2	A1		18	5	-4	0	0	19	2.9838	
3	A2		18	5	-8	0	0	15	2.4059	
4	A3		18	5	-12	0	0	11	1.8279	
5	A4		18	5	-20	0	0	3	0.6720	
6	A5		18	5	-30	0	0	-7	-0.7729	
7	A6		17	4	-40	0	0	-19	-7.1167	
10	B1		16	10	-2	0	0	24	3.4891	
11	B2		16	10	-4	0	0	22	2.4201	
12	B3		16	10	-6	0	0	20	1.3510	
13	B4		16	10	-8	0	0	18	0.2820	
14	B5		16	10	-10	0	0	16	-0.7871	
15	B6		15	8	-12	0	0	11	-6.7551	
16				A Queen Score	B Queen Score		A Z-SCORE	B Z-SCORE		
17	1			19	24		2.9838	3.4891		
18	2			15	22		2.4059	2.4201		
19	3			11	20		1.8279	1.3510		
20	4			3	18		0.6720	0.2820		
21	5			-7	16		-0.7729	-0.7871		
22	6			-19	11		-7.1167	-6.7551		
24			17.83333333	4.833333333	-19	0	0			
25			0.4082482905	0.4082482905	13.84196518	0	0			
27			15.83333333	9.666666667	-7	0	0			
28			0.4082482905	0.8164965809	3.741657387	0	0			

Beekeeper A has mite counts ranging from 4 to 40 while beekeeper B only has 12 mites in their worst hive. Yet their Z-Scores are very similar. We don't want this.



	A	B	C	D	E	F	G	H	I	J
1	1	2	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:	? Z-SCORE	
2	A1		18	5	-4	0	0	19	2.8165	
3	A2		18	5	-8	0	0	15	0.1498	
4	A3		18	5	-12	0	0	11	-2.5168	
5	A4		18	5	-20	0	0	3	-7.8502	
6	A5		18	5	-30	0	0	-7	-14.5168	
7	A6		17	4	-40	0	0	-19	-26.0825	
10	B1		16	10	-2	0	0	24	4.1498	
11	B2		16	10	-4	0	0	22	2.8165	
12	B3		16	10	-6	0	0	20	1.4832	
13	B4		16	10	-8	0	0	18	0.1498	
14	B5		16	10	-10	0	0	16	-1.1835	
15	B6		15	8	-12	0	0	11	-7.4158	
16			A Queen Score		B Queen Score		A Z-SCORE		B Z-SCORE	
17	1			19	24		2.8165	4.1498		
18	2			15	22		0.1498	2.8165		
19	3			11	20		-2.5168	1.4832		
20	4			3	18		-7.8502	0.1498		
21	5			-7	16		-14.5168	-1.1835		
22	6			-19	11		-26.0825	-7.4158		
24			17.83333333	4.833333333	-19	0	0			
25			0.4082482905	0.4082482905	13.84196518	0	0			
27			15.83333333	9.666666667	-7	0	0	Ave count -7		
28			0.4082482905	0.8164965809	3.741657387	0	0	Std Dev 3		

So to change this we can use a club wide average and standard deviation when calculating the Z-Scores for mites. Here I have used an average of 7 and a standard deviation of 3.



	A	B	C	D	E	F	G	H	I	J
1	1	2	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:	? Z-SCORE	
2	A1		18	5	-4	0	0	19	2.8165	
3	A2		18	5	-8	0	0	15	0.1498	
4	A3		18	5	-12	0	0	11	-2.5168	
5	A4		18	5	-20	0	0	3	-7.8502	
6	A5		18	5	-30	0	0	-7	-14.5168	
7	A6		17	4	-40	0	0	-19	-26.0825	
10	B1		16	10	-2	0	0	24	4.1498	
11	B2		16	10	-4	0	0	22	2.8165	
12	B3		16	10	-6	0	0	20	1.4832	
13	B4		16	10	-8	0	0	18	0.1498	
14	B5		16	10	-10	0	0	16	-1.1835	
15	B6		15	8	-12	0	0	11	-7.4158	
16			A Queen Score		B Queen Score		A Z-SCORE		B Z-SCORE	
17	1			19	24		2.8165	4.1498		
18	2			15	22		0.1498	2.8165		
19	3			11	20		-2.5168	1.4832		
20	4			3	18		-7.8502	0.1498		
21	5			-7	16		-14.5168	-1.1835		
22	6			-19	11		-26.0825	-7.4158		
24			17.83333333	4.83333333	-19	0	0			
25			0.4082482905	0.4082482905	13.84196518	0	0			
27			15.83333333	9.666666667	-7	0	0	Ave count -7		
28			0.4082482905	0.8164965809	3.741657387	0	0	Std Dev 3		

Now the Z-scores for the bee yard with the higher mite counts are down where they belong and the bee yard with fewer mites has scored much higher.





	A	B	C	D	E	F	G	H	I	J	K
1	1	2	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:		? Z-SCORE	
2	A1		18	5	-2	0	0	21		3.7416	
3	A2		18	5	-4	0	1	20		4.8577	
4	A3		18	5	-6	0	0	17		1.0749	
5	A4		18	5	-8	0	0	15		-0.2584	
6	A5		18	5	-10	0	0	13		-1.5918	
7	A6		17	4	-12	0	0	9		-7.8241	
8											
10	B1		18	5	-2	0	0	21		4.1498	
11	B2		18	5	-4	0	0	19		2.8165	
12	B3		18	5	-6	0	0	17		1.4832	
13	B4		18	5	-8	0	0	15		0.1498	
14	B5		18	5	-10	0	0	13		-1.1835	
15	B6		17	4	-12	0	0	9		-7.4158	
16				A Queen Score	B Queen Score		A Z-SCORE	B Z-SCORE			
17	1			21	21		3.7416	4.1498			
18	2			20	19		4.8577	2.8165			
19	3			17	17		1.0749	1.4832			
20	4			15	15		-0.2584	0.1498			
21	5			13	13		-1.5918	-1.1835			
22	6			9	9		-7.8241	-7.4158			
23											
24			17.83333333	4.83333333	-7	0	0.166666667				
25			0.4082482905	0.4082482905	3.741657387	0	0.4082482905				
26											
27			17.83333333	4.83333333	-7	0	0	Ave -7			
28			0.4082482905	0.4082482905	3.741657387	0	0	Std Dev 3			
29											

Categories like brood pattern offer up a different problem. Most likely the only time anyone would use this category would be to give a higher score to one queen that had a really good pattern, or a low score to a hive with a bad pattern. Where a category usually has 0 entered, then the times something other than 0 are used will over weight the category.



	A	B	C	D	E	F	G	H	I	J	K
1	1	2	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:		? Z-SCORE	
2	A1		18	5	-2	0	0	21		3.7416	
3	A2		18	5	-4	0	1	20		4.8577	
4	A3		18	5	-6	0	0	17		1.0749	
5	A4		18	5	-8	0	0	15		-0.2584	
6	A5		18	5	-10	0	0	13		-1.5918	
7	A6		17	4	-12	0	0	9		-7.8241	
8											
9											
10	B1		18	5	-2	0	0	21		4.1498	
11	B2		18	5	-4	0	0	19		2.8165	
12	B3		18	5	-6	0	0	17		1.4832	
13	B4		18	5	-8	0	0	15		0.1498	
14	B5		18	5	-10	0	0	13		-1.1835	
15	B6		17	4	-12	0	0	9		-7.4158	
16				A Queen Score	B Queen Score		A Z-SCORE	B Z-SCORE			
17	1			21	21		3.7416	4.1498			
18	2			20	19		4.8577	2.8165			
19	3			17	17		1.0749	1.4832			
20	4			15	15		-0.2584	0.1498			
21	5			13	13		-1.5918	-1.1835			
22	6			9	9		-7.8241	-7.4158			
23											
24			17.83333333	4.83333333	-7	0	0.166666667				
25			0.4082482905	0.4082482905	3.741657387	0	0.4082482905				
26											
27			17.83333333	4.83333333	-7	0	0	Ave -7			
28			0.4082482905	0.4082482905	3.741657387	0	0	Std Dev 3			
29											

Look at how the 1 entered on hive A2 actually lowered all of the other category Z-Scores compared to group B. Group A and group B have identical values in all the categories except for brood pattern for hive A2!



	A	B	C	D	E	F	G	H	I	J	K
1	1	2	Number of frames	Pounds of honey harvested	Number of mites (in negative)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:		? Z-SCORE	
2	A1		18	5	-2	0	0	21		4.5581	
3	A2		18	5	-4	0	-50	-31		0.7753	
4	A3		18	5	-6	0	0	17		1.8914	
5	A4		18	5	-8	0	0	15		0.5581	
6	A5		18	5	-10	0	0	13		-0.7753	
7	A6		17	4	-12	0	0	9		-7.0076	
10	B1		18	5	-2	0	0	21		4.1498	
11	B2		18	5	-4	0	0	19		2.8165	
12	B3		18	5	-6	0	0	17		1.4832	
13	B4		18	5	-8	0	0	15		0.1498	
14	B5		18	5	-10	0	0	13		-1.1835	
15	B6		17	4	-12	0	0	9		-7.4158	
16				A Queen Score	B Queen Score		A Z-SCORE	B Z-SCORE			
17	1			21	21		4.5581	4.1498			
18	2			-31	19		0.7753	2.8165			
19	3			17	17		1.8914	1.4832			
20	4			15	15		0.5581	0.1498			
21	5			13	13		-0.7753	-1.1835			
22	6			9	9		-7.0076	-7.4158			
24			17.83333333	4.83333333	-7	0	-8.33333333				
25			0.4082482905	0.4082482905	3.741657387	0	20.41241452				
27			17.83333333	4.83333333	-7	0	0	Ave -7			
28			0.4082482905	0.4082482905	3.741657387	0	0	Std Dev 3			

We can fix this by making this category a pass fail. We enter 0 for normal or good brood patterns and we enter negative 50 for anything with a bad brood pattern. This still skews things a bit but works much better.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Queen ID	Eval Date	Number of frames	Pounds of honey harvested	Mite Count Method	Number of mites (in negative)	Mite Treatment score (0 or -2 or -4)	Brood Treatment score (0 or -1, -5 or -50)	Overwintering Score (max 15)	Temperament (0 or -50)	Brood Pattern Score (0 or -50)	Total Queen Score:	Z-SCORE	Comments and Notes:
2	B1		16	10	AW	-2	0	0	0	-50 ▾	0 ▾	-26	-44.6835	This is B1 comment
3	B2		16	10	AW	-4	0	0	0	0 ▾	0 ▾	22	3.3165	
4	B3		16	10	AW	-6	0	0	0	0 ▾	0 ▾	20	1.3165	
5	B4		16	10	AW	-8	0	0	0	0 ▾	0 ▾	18	-0.6835	
6	B5		16	10	AW	-10	0	0	0	0 ▾	-50 ▾	-34	-52.6835	B5 comment area
7	B6		15	8	AW	-12	0	0	2	0 ▾	0 ▾	13	-7.5825	
8										▾	▾			
9										▾	▾			
10										▾	▾			

Here is the current version. It is still evolving. I will stop tweaking it so we can start using it this summer for the NUCs we got from Pat Ennis or for any hives you want to use it on.

You can get a copy of it at [LoneOakHoney.com](http://LoneOakHoney.com) on the Info and FAQ page.





# THANK YOU.

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**Siouxland Beekeepers**  
**[SiouxlandBeekeepers.org](http://SiouxlandBeekeepers.org)**