SARE Grant Research Produces Big Results in Two Colony Hive Trials

Probably most beekeepers are not aware of SARE grants (Sustainable Agriculture Research and Education) as a means of funding farmer driven research. These grants are available from the U.S. Department of Agriculture through one of the land grant colleges in seven different regions in the United States. SARE grants fund research in all branches of farming. Previous beekeeping grants have focused, among other things, on methods of controlling acarine and varroa mites. A Year 2000 Farmer/ Grower grant that I received funded grass roots research that compared the productivity and profitability of Two Colony Hives vs. standard Langstroth hives.

The Two Colony Hive used in this experiment was developed during the 1980's while I was living and working in California. All brood chamber hive bodies have ¾ inch thick divider boards and five frames on either side of the divider board. These hive bodies are 18 inches wide rather than the 16 ¼ inch width of the standard Langstroth hive body. Two clusters of bees are able to grow upwared in the Two Colony Hive independently of each other. Theoetically, since each cluster only occupies half of the room that a cluster in a standard hive occupies, the Two Colony Hive should be twice as productive as a standard hive.

The productivity trials that I conducted went from the Years 2000 to 2004. I conducted comparisons of overwintering, Spring income, and Summer honey production between Two Colony Hives and standard hives.

Overwintering

I was able to compare overwintering success of Two Colony Hives and standard hives in the Spring of 2001, 2002, and 2003. In all three years, I was comparing hives that all had queens less than one year old raised during the previous growing season. The following table shows the year by year results.

Year	# Standard Hives	# Clusters Overwintering	# Two Colony Hives	# Clusters Overwintering
2001	17	8	24	33
2002	12	10	12	22
2003	9	9	15	21

A total of 51 Two Colony Hives brought 76 clusters of bees through those winters while 38 standard hives overwintered 27 clusters. The Two Colony Hives overwintered 74.5% of their clusters while the standard hives overwintered 71% of their clusters. More importantly, though, each Two Colony Hive brought an average of 1.49 clusters through the winter compared to 0.71 clusters for the standard hive.

Spring Income

Spring income was also compared during 2001, 2002, and 2003. My bee operation makes money in two ways during the Spring: by selling nucs to other beekeepers and by sending bees to apple pollination. The Two Colony Hives were used to procduce nucs

while the standard hives did the pollination. The results from these years are listed on the following table:

Year	Standard Hive	Two Colony Hive	% Increase
2001	$15.53	$21.35	37%
2002	$29.17	$90.58	211%
2003	$44.89	$51.60	15%

Two Colony Hives could have done better in 2001 but I was late getting my classified ads into the bee journals. The Two Colony Hives did so well in 2002 because the winter of 2001/ 2002 was very mild and pollen came in early. Not only did I sell nucs from these hives but I was also able to sell additional brood to beekeepers who were buying queens from other sources. The standard hives did very well in 2003 because I had 100% overwintering success with the standard hives that year.

Honey Production

Though this experiment began in the year 2000, I did not have any meaningful results that year. Hives were constructed in the Spring at the Wood Technology Department of Morrisville State College and were not stocked until June. During 2001, 2002, and 2003 Two Colony Hives that had been "nuked out", were subjected to increasingly tough competition against standard hives. In 2004, 2 Two Colony Hives were not "nuked out" and were compared against the best standard hives in my operation. Honey production was measured by weighing honey supers before and after extracting; the difference between these numbers is the amount of honey extracted. Cappings wax is included in these figures. The results are listed on the following table:

Year	Standard Hive Average/ # Hives	Two Colony Hive Avg./ # Hives
2001	38.4 lb. avg. / 12 hives	82.75 lb. avg. / 12 hives
2002	63.9 lb. avg. / 9 hives	66.8 lb. avg. / 15 hives
2003	152.8 lb. avg. / 6 hives	51.9 lb. avg. / 10 hives
2004	151 lb. avg. / 8 hives	357 lb. avg. / 2 hives

In 2001, I compared a dozen Two Colony Hives to a dozen standard hives. Five frame nucs had already been sold from the Two Colony Hives and they had been requeened with queen cells. The standard hives were also new hives that had been started with brood and queen cells. By the time these hives were moved to their summer yard in early July, everything was still only a single story high but most were ready for their second hive body. At the start of the trials I trieed to make sure that the standard hives were more than twice as strong as either side of one of the Two Colony Hives.

In 2002, the experiment was run in a similar manner as the 2001 experiment except that the standard hives were even stronger than the previous year. Two of the standard hives were two deeps with two shallows when they were moved to the summer yard.

In 2003, the Two Colony Hives were treated the same as in previous years but this time they were compared to full strength standard hives. While the Two Colony Hives were only one story high in early July, all of the standard hives were already being supered. Plus, I actually picked out some of the best standard hives in my operation for the test.

In 2004, my intention was to run Two Colony Hives at full strength throughout the honey producing season. Even though I did not advertise in the bee journals, I still had many requests for nucs sales. I really overcommitted to selling nucs and had only 2 Two Colony Hives left at full strength for the experiment. These two hives were compared against the best standard hives in my operation. 2004 was a below average year for honey production in Central New York and by the end of July looked to be a real disaster. Production picked up during August and early September. The two colony hives produced surpluses of 370 ½ lb. and 344 lb. Surplus production from the eight best standard hives in my operation were weighed and averaged 151 lb. The best production by a standard hive in this bee yard was 188 lb. and the best production of all of my standard hives was 216 lb.

To my knowledge, the world record that is being claimed for a single hive in one season is 404 lb. This record was set in 1974 by Ormond and Henry Aebi of Santa Cruz, California. In their book, Mastering the Art of Beekeeping, the Aebis state that the previous record was 300 lb. by A.I. Root of Medina, Ohio in 1895. The Aebis were quite happy that they once again surpassed the previous record when one of their hives produced 310 lb in 1976. Though I do not know what methods the Aebis used to measure their surplus, I bellieve that I was able to make a good run at these records using only two hives during a below average year.

Future Research

A conference sponsored by SARE in Vermont that I attended this past October turned out to be a great networking opportunity. As a result, Maryann Frazier of Penn State Cooperative Extension has applied for a SARE Partnership Grant to continue research on the Two Clony Hive. If this application is successful, Two Colony Hive trials will be conducted at three locations in 2005 and 2006.