1. Project name and contact information:

Beekeeping: More Honey with Less Chemicals
Grant #F. N. E. 04-504
Craig A. Cella
867 E. Winter Rd.
Loganton, Pa. 17747 570-725-3682

2. Goals:

I want to develope a management practice for producing more honey while at the same time using less "in hive" chemicals, thus promoting beekeeping as a sustainable farming enterprize. My goals are to decrease swarming, diseases and chemical use while increasing honey production and overall income for farmers. Honey is looked upon as a natural and clean health product; and to keep this reputation, beekeepers must produce honey without chemical residues.

3. Farm Profile:

We raise high quality registered Polled Hereford cattle that we sell as foundation breeding stock to other farmers that want to improve their herds. In the spring and summer, we hatch and sell game birds and produce hay. Presently my wife is the full time farmer and I help with the haying while working as a bee inspector for the Pa. Dept. of Ag and I also manage the colonies at P.S.U. These two positions have been a real asset in doing my research on this grant project. Last spring I entered the season with 123 colonies of which 117 were enrolled in my research.

4. Participants:

Over the time of spring, summer, and fall all hives were monitored for mites, deseases, swarming, and production. The data collection must be done in as short a time frame as possible, usually two days. We used seven people to do this; myself, Dennis Van Engalsdrop, Pa. Dept Ag. State Apiarist, his assistants, Marcus, Tiffany, Mary, Glenn Crimbring, Pa. Dept. Ag. Bee Inspector, and Kent Kaster, Pa. Dept. Ag. Bee Inspector. Also the virus levels are being analyzed and measured by P.S.U. Dennis was the real engineer. I did the swarming counts, weighing, and bee collecting while Mary kept the records.

5. Project Activities:

I started with 17 overwintered colonies on old comb and added 100 hives started from 3 lb. packages for a total of 117. Each colony had a number, fifty were installed on drawn comb and fifty were installed on new foundation. All of the hives were managed the same with no help given to the problem ones. Those died out and others will continue to as winter leads into spring. Only the good will survive. This coming year will be an extension of last but with new ideas to be tried. I have another one hundred packages ordered to rebuild my colonies and collect more data. You must

work with a large number of hives to prove something. The year before I used a small number and was mislead.

6. Result:

Dennis put all the collected data into his computer and had 12 pages that he explained in detail to me. In plain english there were 5 locations over a 70 mile spread - river bottom to mountain top. There was no significant difference in the swarming rate between packages installed on drawn comb, new foundation, or overwintered colonies. Sixty four hives swarmed at least once, twenty seven swarmed at least twice, and 21 didn't swarm.

There was no significant difference in ending condition - alive or dead or queenless between locations. The mite counts in the hives that never swarmed was 72 and 67 in those that swarmed at least once.

The average gain in location #1 was 70 lb., location #2 - 62 lb., Location #4 - 88 and location #5 - 59 lb. Location did not make a difference.

The top 10% average gain was 135 lb. while the bottom 10% average gain was 35 lb. The top 1/3 average gain per hive was 109 lb., the middle 1/3 average gain per hive 74 lb., and the bottom 1/3 average gain per hive was 41 lb.

7. Condition:

It was an excellent year although we had a lot of rain. Some hives did very well. In Sept. we had a large flood and I lost one entire yard to it. However one hive stayed intack because it was piled so high. The bees died but I was able to wade in after a week and get a weight - a total gain of 303 lbs! Another location had 6" of water in the hives but the brood survived and the ground at another location in a state park was covered with 2 feet of water but the bees were o.k.

8. Economics:

At this point I can not say where we are money wise. I did learn you must decide if you seek knowledge or honey production - you can not have both. After you have the knowledge and then you apply that hopefully it will result in higher profit.

9. Assessment:

I was always looking and observing from the first day to the last of the season. I had some disappointments - the first being that the mite levels and swarming rate were the same in the different groups so my ideas were wrong. Next I lost 1/5 of my reasearch hives in the flood - had I not listened to the weather man I'd finished collecting data before the flood. I knew better then to listen but I had other people involved and didn't want them to waste a trip. However there are some very large gains in this project. Unlike most other types of living things the colonies that produced the most because they had the largest number of bees also had the highest mite counts. So mite levels do follow brood levels which will also affect the virus level.

The most important thing that I proved was something I noticed years ago and used to joke about but it is no longer a joke. For 25 or more years I would say that a third of your hives will make a lot of honey, a third will make some and a third will make none - the rule of threes as I called it. It really applies to many things in life. With my honeybees this year, the bottom 1/3 did not make enough honey to get through winter. Most beekeepers would feed them and help them along - why? If you have a runt pig in a litter do you try to save it? Do you keep a calf out of a poor milk cow? I think it is important to cull at least the bottom third of your colonies - preferably 1/2 each year. I have never in 48 years read anywhere or heard a speaker say 1/3 of the bees are of poor quality. It is always how the beekeeper manages them. Now I know different and I have the proof. When someone comes up to me and explains about a problem hive I tell them to hit it over the head and throw it out on the compost heap. Perhaps I'm not very tactful but truthfull - you can't make a silk purse out of a hogs ear. The queen IS the colony and if she is producing poor stock she always will. Everyone says to unite 2 weak colonies in the fall so they get one through winter. Fine, now you have inferior drones next spring to mate with your new queens. Cull them out at the end of summer. Requeen in late summer if they are strong enough to warrant it. The joke among beekeepers is: 80% of our time is spent on 20% of our hives which are the poor producers. Let's start farming like crop and livestock farmers.

One of my ideas for this coming year is to remove the queen from every other hive and see what this does towards swarm prevention. The other big one that Dennis and his group will help with is to measure brood in late spring and see if we can measure a hives potential production for the summer and if we can pick out the poor queens at this time.

My next project will be for a different objective. Presently no one does research on honey bees in a side by side test. I want to duplicate the corn trials that P.S.U. does except with honey bees. Use at least 5 colonies from 4 different producers of packages at each location and measure for production, mites, and swarming. Presently all we base our decision on where to buy is which advertisement looks best. It is time someone does this. If one suppliers bees produce significantly better than someone elses, it will force those poor producers to develop better bees just as corn breeders are always improving. I have spoken with a couple of producers and they think it is a good move. Also Dennis and I are going to use some hives for Formic Acid research- an organic form of mite control.

10. Outreach:

I spoke at P.S.U. to the Pa. State Beekeepers in July and again at the annual meeting in November. Presently I help teach beekeeping classes for the Clinton County Extension and in February I will speak at Beaver Campus of Western Pa. and I have two Produce and Fruit Grower meetings where I will teach keeping bees for pollination. I also plan to send this information into the national magazines that I have written articles for before.

Craig A. Cella