

1. Project Name: Selecting Better Honeybees for the Northeast
#FNE07-601

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2. Goals: I would like to have beekeepers in the Northeast develop honeybees that have a superior disease resistance, are gentle to work with and can make beekeeping more profitable. A relatively simple way of selection must be developed that could be used by the average beekeeper.

3. Farm Profile: We have a little over one hundred acres of high valley limestone farmland located near the center of Pa. about 3 miles from I 80. We raised registered Polled Hereford cattle for many years and also produced thousands of turkeys each year as a contract grower. We still work with gamebirds and provide natural cover with both trees and plants that produce honeybee pasture. Some acreage is still devoted to hay and grass production. Approximately forty acres were planted with honey producing plants (sweet clover, black locust, and borage) this past year. Most of our honey is sold at the farm or shows to people that want pure raw honey produced from antibiotic and chemical free hives.

4. Participants: I am very fortunate to be involved with the Pa. Dept. of Ag as a honeybee inspector with guidance from Dennis vanEngelsdorf as my technical advisor. I also work at P.S.U. as their "bee wrangler" doing what ever field work is needed from me. This gives me the opportunity to be on the cutting edge of the latest findings from their research which I pass along to other beekeepers. I also had four other beekeepers help in the year's project which provided very diverse micro environments and management styles. Glenn Crimbring is a state bee inspector from the northern tier near the New York line who works along with Tim Thomas to produce honey and do a little pollination. I had a total of twenty hives in that area which is known for late season honey crops. Ten more were managed by a retired school teacher, Darryl Rebuck about 8 miles east of Montoursville, Pa. on a fruit farm near river bottom ground. Another beekeeper, Richard Schimmel had his hives on the Allegheny Mountain plateau near Philipsburg, Pa. surrounded by coal mine strippings and farmland. My ten were located in a high limestone soil valley near the center of the state about 3 miles south of I 80. I also had the laboratory at U.S.D.A. Beltsville, Md. help to do the nosema spore counting.

5. Project activities: Each beekeeper was provided with five 3 lb. packages of bees on April 2 with instructions for the season. Twenty five queens were ordered for 5/27/07 from three different suppliers for a total of seventy five. Only fifty were needed but I wanted a back up in case one of the shipments was lost or dead. Each cooperator was provided with ten queens – five from Wooten's apiaries, Palo Cedro, Ca. and five from Pendell Apiaries of Stonyford, Ca. None of the queen suppliers were told of this research project because I wanted their "run of the mill" stock, not hand picked queens. Each package hive was divided in half on May 27 forming ten from five with a number to be

matched with a queen. I was the only person to know where each queen came from thus eliminating "tilting the scales." Sticky boards were placed under screened bottom boards on July 1st. for 72 hours and every 30 days after that until the end of Sept. Virus indicators – the number of empty cells in a 3" dia. circle of sealed brood – were counted the middle of July. Hygienic behavior – expressed as percentage of brood removed in a twenty four hour period after a freeze kill with liquid nitrogen was done the same day. Square inches of sealed brood were determined for each colony at the same time while also observing how gentle or aggressive each hive was. In Sept. each hive was weighed on a portable postage shipping scale for a total hive weight and brood was measured again. Mite counts were done again and one hundred bees per hive were placed in alcohol to be sent away for Nosema testing at a U.S.D.A laboratory. Altogether over five hundred data samples and 5000 bees were collected for this project.

6. Results: July Counts

Virus indications – the number of empty cells in a 3" dia. circle of sealed brood

Wooten's – 22 ave.

Pendell's – 23 ave.

Hygienic behavior – expressed as percentage of brood removed in a twenty four hour period after freeze kill with liquid nitrogen.

Wooten's – 77%

Pendell's – 77%

Brood: measured in square inches of sealed brood:

Wooten's – 530 square inches

Pendell's – 564 square inches

Mites per hive: measured in 72 hour sticky board drop

Wooten's – 1.0

Pendell's - .72

September counts:

Total hive weight: weighed on a portable postage shipping scale.

Wooten's – 156 lbs.

Pendell's – 161 lbs.

Brood: measured the same way as in July:

Wooten's – 465 square inches

Pendell's – 427 square inches

Mites: again the three day sticky board drop

Wooten's – 29 mites

Pendell's – 29.5 mites

Nosema: counts preformed by U.S.D.A.

Four colonies from Wooten's were infected with nosema spores at a rate of 0.55, 0.15, 0.35, and 3.20 million per bee producing an average of 1.06.

Seven colonies from Pendell's were infected with nosema spores at a rate of 0.25, 0.35, 0.40, 0.25, 1.20, 0.15, and 0.45 million per bee producing an average of 0.47.

30 bees were examined form each 100 bee samples. Nosema average spore counts of one million or more per bee are considered high.

7. Condition: some areas had near normal rainfall and others were declared a drought disaster area by the governor. Over all, it was a hot dry year.

8. Economics: If a beekeeper could produce his own queens at twenty dollars per queen and increase production by 30% thru culling the bottom third that don't produce any honey and get his winter losses down to 10% he could increase his bottom line from a minus to a plus number where we used to be before the mite problem.

9. Assessment: I had hoped to see a larger difference in the results between the two suppliers so I could say – "Wow! Look what we proved" but I didn't. However the purpose wasn't to prove one supplier better or worse but to prove what five beekeepers working together can do.

10. Adoption: This was a rather simple monitoring process that any beekeeping group could perform by simply following what five local beekeepers have done. The process can be modified to other areas of importance as problems come about or leave. I think it has a lot of potential and needs to be worked on by a larger group and with local queens.

11. Out reach: I have already set up an information stand at our annual state meeting this fall and I have been scheduled to be a speaker in Feb. at the P.S.U. campus in Beaver County, for their annual two day workshop. I have also written an article for the American Bee Journal to be published later this winter.

12. Report summary: I wanted to set up a procedure where local beekeepers could measure their own bees and select the best. Five beekeepers in five different micro environments were able to compare individual hives against one another and two different queen suppliers against one another. We were able to see differences between each hive, (some were significant) and able to see if there was a difference between the two queen suppliers bees. All in all I feel it was a very worth while project and hope more people will join in the future to help solve our bee problems.

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