Beekeeping Newsletter

West Virginia Department of Agriculture
"serving the citizens from the soil to the supermarket"
Gus R. Douglass, Commissioner

Vol. 17, No. 4 | October/November/December 1985 | Charleston, W.Va.

J. Bruce Given

Bruce Given passed away on October 30, 1985, following a brave struggle with bone cancer. He was born on the family farm near Frametown, West Virginia, on October 8, 1911, and so was 74.

Bruce became a member of the Plant Pest Control Division of the Department of Agriculture on a seasonal basis in 1951. He served as a field scout on Japanese beetle, oak wilt and other surveys. He continued these duties upon becoming a full-time staff member in June 1952. Later, when Roger Pease retired from the American Chestnut Project, Bruce was assigned to that position. It was here that his native intelligence and "green thumb" paid off. He found many trees in the 20-inch diameter and larger classes that were still clinging to life, although seriously diseased, and he started an extensive grafting project to try to save this germ plasm. From these trees, he also collected thousands of chestnuts for planting and had made some selections.

Bruce was well-known amongst the professional scientists from several states who later began to work with chestnuts, and several invited him to visit their labs to discuss the problem as he saw it.

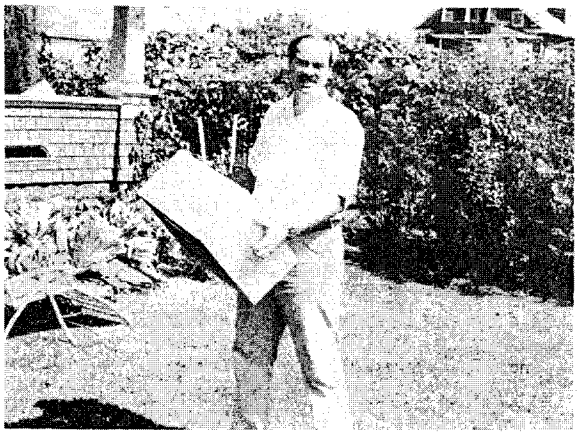
Although Bruce never aspired for a supervisory position or otherwise coveted wide recognition, he had a passion for a job well-done. This can be said about his entire life—from teaching shape note music in rural churches as a young man, to pioneering the use of hybrid corn in the State as a young farmer, to his love and interest in chestnuts—it was well-done! He will be missed by his friends, colleages and, above all, his family.

Montgomery Leaves Apiarist Position

Bardwell Montgomery resigned the position of West Virginia State Apiarist effective September 20, 1985, in order to undertake a six-month commitment to the Witness for Peace program in Nicaragua.

Apiary Inspector Matthew Cochran will be in charge of the apiary inspection program on an interim basis until the position is filled. Cochran has worked for the past two seasons as an apiary inspector for the West Virginia Department of Agriculture.

[*Editor's Note:* In an article in the September 1985 issue of *The Speedy Bee,* Bard tells of his December 1984 and June 1985 visits to Nicaragua beeyards and beekeepers in several parts of the country and how he found the whole matter of adaptation to the Africanized honeybee (confirmed in Nicaragua in 1984 but not yet predominating in apiaries) quite interesting. He also mentioned that he would be available to conduct a tour of Nicaragua from December 8-15. However, due to the lateness of this issue of the newsletter, it is obvious that the proposal could not bear fruit. Consequently, those that might be interested in visiting beekeepers in that country should contact **Bard Montgomery, c/o Betsy Crites (Witness for Peace Office), 1414 Woodland Drive, Durham, NC 27701.**]



American Foulbrood

[*Editor's Note:* Douglas G. McRory, Apiculturist with the Ontario, Canada Department of Agriculture, provided a lengthy summary on American Foulbrood in the June *Apiculture Newsletter.* The following is an adaptation of the article.]

The words American Foulbrood make a beekeeper shudder to think that it might happen to him.

I would like to think through the subject of American Foulbrood with you and relate it to our recommendations for utilizing of drugs in the honeybee industry and the inspection program that we conduct in O.M.A.F. American Foulbrood was, before the early 1940's, a very devastating problem for Ontario beekeepers.

Let us think for a while about just exactly what American Foulbrood is. The discovery of the microscope opened up a whole new world of amazing biological creatures for man to understand. These are one-celled microscopic organisms which have developed various ways to live and exist in our environment here on earth. When man first looked down a microscope and discovered that these were actually living creatures, he must have been thoroughly amazed at their numbers and their ability to adapt to their niche in the environment. American Foulbrood, or "Bacillus larvae," as it is known scientifically, is one such creature. It is a microorganism that is extremely well developed in living in a very particular niche in the environment. The only place that it is found is in bees, and it only affects the larval form of the honeybee. It is very specific and well adapted to life in that way. Because they are so small, and we cannot see them, we do not appreciate the magnitude of the numbers of individual living creatures that can exist in a disease organism such as American Foulbrood. One scale of American Foulbrood can contain as many as 20 billion spores. Each spore is an individual living thing that can infect a honeybee. Our problem as beekeepers is to provide an environment for our bees to live in, in which there are no American Foulbrood organisms or if they do exist in the environment, provide a therapeutic agent which will stop the growth of these organisms.

The American Foulbrood organism is a very well developed and specific one as I have already mentioned. It has to be introduced to the host larva in the first two days of the larva's life. It has been shown by research that as few as eight spores fed to a larva will kill it. If a honeybee larva ingests the spore of American Foulbrood, the spore germinates just as a seed would and forms a vegetative rod formation in which it grows and multiplies very quickly. The larva dies in the prepupal stage, which is a matter of six days after it has hatched from the egg. This is phenomenal when you think about going from a very few spores to 20 billion spores.

Individual bees in a colony are something similar to individual cells in a body. By themselves they are not very significant, but together they form the overall structure of the colony. As the adult worker honeybees feed young larvae, if they find that the larva is sick or there is something wrong with it, they have no way to doctor it, such as we would. Their innate behavior pattern tells them to take that individual larva out of the hive and let it die. This is what they do as larva become sick with American Foulbrood. This has been shown by research that they will take out up to 80% of the larvae at specific times when they are sick. We, as beekeepers, do not often realize this; the only time we become aware of it is when we notice what we call "spotty brood." In other words, there are some cells that are capped and have made it through to pupa, and many cells around them that are empty or just at the egg stage. We often blame this on the queen, but many times it is that something has happened to those individual larva; and the bees, in their function to retain the health of the total hive, have taken those larvae outside and dropped them. If the larva are very small, the bees will even eat them themselves.

How does this relate to American Foulbrood? When spores are present in a hive and fed to the larvae, these larvae die and many of them are taken out of the hive. We, as beekeepers, do not see this going on. What we finally see is when the hive can no longer keep up with the number of larvae that are dying, and they die in the prepupal stage, stretched out in a cell, and usually have been capped over. These "signs," as we call them, of the disease, of dead

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The Cost of American Foulbrood

Beekeepers seldom stop to think of what American Foulbrood (AFB) costs in the way of dollars and cents, mainly because many have never been troubled with the problem of American Foulbrood in their colonies.

In one 40-mile region of West Virginia, approximately 150 colonies succumbed to American Foulbrood disease. In using this figure to calculate the financial impact of AFB toward the beekeeping community in that area, you will see just how expensive it can be.

The actual cost for replacement of these colonies in 2-pound packages is estimated to be $8,062.50, purchased in the usual manner;

Foundation wax for 1 hive and 3 supers—	$ 27.00
2-pound package of bees with Queen—	26.75
	$ 53.75
	× 150
	$8,062.50

Looking toward total replacement in the scope of what has actually been lost in the way of honey surplus, bees, wax and time shows a totally different picture altogether.

In calculating the actual cost of a hive of bees, one must consider the many factors that enter into figuring the total loss. The first factor is the replacement of the bees that have been lost. An average hive of bees will have approximately 20+ pounds of bees, $26.75 being the current price for a 2-pound package of bees; the cost of actual poundage replacement would be $222.50 minus Queens or $33,375 per 150 colonies.

The second factor is the loss of any surplus honey crop due to the death of the colony. An average of 70 pounds of surplus honey per colony at the estimated retail price of 65¢ per pound would generate a loss of $6,825 for the 150 colonies lost.

The third factor relates to fumigation, in that no honey can be fumigated; such honey has to be cut out and burned if it cannot be salvaged by the beekeeper, leaving the frames vacant of any wax or comb. A standard hive body requires 10 sheets of wired foundation at a cost of $8.40 plus enough foundation for 3 supers costing $18.60 at a combined cost of $27, or $4,050 for the 150 colonies lost.

Last, but not least, is the question of how much honey do bees consume to produce a pound of wax, or how much honey is lost in the process of building the comb? There are approximately 5.7 pounds of wax in a hive consisting of 1 hive body and 3 supers. It is estimated that bees have to consume 9 pounds of honey to produce 1 pound of wax. With honey at a general retail price of 65¢ per pound, it would take $33.34 to produce the comb hive or $5,001 for 150 colonies lost.

Keeping all these figures in mind, you will find the to very devastating.

Total Combined Loss of the 150 Colonies

Factor #1: The loss of 20 pounds of bees—replacement cost =	$33
Factor #2: The loss of surplus honey crop—replacement cost =	6,
Factor #3: The loss of foundation—replacement cost =	4,
Factor #4: The loss of honey in the production of comb =	5,
Total	$49,

As you can see, the cost of American Foulbrood is expensive. The total figure of $49,251 shows a view of wh financial loss would be if these colonies were replaced t original state of strength.

There is a way to offset, or drastically reduce, the cost o The use of Terramycin, the trade name for oxytetracyclin Pfizer & Company, is recommended for the preventi American Foulbrood in bee colonies and can be purchase many of the livestock feedstores throughout the Terramycin is easy to use and costs 50¢ to 75¢ per colony pe This antibiotic comes in two forms—TM10 and TM2 numbers referring to the amount of drug in each package seen on the ingredient label referring to the active ingredie the package. Terramycin loses its potency in syrup rather qu thus, the usual recommendation is to use it as a dust in a m with confectioners or powdered sugar. The prescribed mixtu each form of Terramycin is as follows:

TM10—Mix 1 tablespoon of TM10 to 4 tablespoo confectioners sugar.

TM25—Mix 1 tablespoon of TM25 to 8 tablespoo confectioners sugar.

The prescribed dosage per colony is 4 tablespoons of th applied over the brood combs 2 or 3 times in early spring at 10-day intervals, no later than one month before the first su honeyflow begins and the same procedure following the rer of the first honey crop in the fall. No treatment should be gi any colony during any part of the honey season. This is nece so there is no possibility of getting any drugs into the honey for human consumption.

20,000 Attend Honey Festival

The fifth annual Honey Festival started Saturday morning, September 28. Even with the cool temperatures, the sun was shining bright, promising a warm beautiful weekend. The festival was opened with a welcoming ceremony greeting everyone who would be taking part in the festivities throughout Saturday and Sunday. Following the welcoming ceremony was the majorette contest held on the adjoining ball field, while bee movies as a form of educational entertainment were being shown in the pavilion theater. Live bee beard demonstrations were staged throughout the day by the renowned bee beard contest winner Steve Conlon, assisted by Clyde Hutchinson. This gave way to the musical entertainment groups of Copperfield Junction and McCumbers Brothers & Conie.

The Honey Festival was fortunate this year to have as a guest the American Honey Princess Crystal Jones. Crystal took part in the festival by giving cooking demonstrations and being present for the coronation of the West Virginia Honey Queen Christi Jett, Williamstown, W.Va., to which Carly Kisner, former reigning Honey Princess surrendered the scepter.

Almost every exhibit within the park and pavilion was full, displaying honey, wax and other craft-related items. A festival continued, the exhibits flourished with many col arrangements ranging from handmade quilts to every concei idea pertaining to beekeeping and honey production.

Later in the afternoon, holding cones filled with hone cream, citizens relaxed while watching square dancing team listening to bluegrass music. At the close of the first day, the W County Band played may selections of music from the 1940's

On Sunday at noon, the festival reopened with coo demonstrations giving way to singing by the gospel group Florida Boys, followed by the 3-mile honey marathon invol 67 runners. The road marathon was won by Don Fossilma Parkersburg; he crossed the finish line at 16 minutes an seconds, with Karen Seiferth winning the women's division. A the conclusion of the road run, an auction was held on behalf the contestants who entered their honey, wax and baked goo the various contests. The rest of the evening was taken up entertainment from the many musical groups attending Festival.

Canaan Valley Meeting

Over 60 members of the W.Va. Beekeepers Association showed up September 13 and 14 for the fall meeting at Canaan Valley State Park. Activities began Friday morning with a series of beekeeping movies provided by the University of Maryland. "Killer Bees—Fact or Fantasy," the first item on the day's triple bill, was a 1975 USDA production which shows Dr. Orley Taylor of the University of Kansas handling swarms of Africanized honeybees (AHB) in South America without veil or gloves. Although for the sake of balance, the film also shows a well-protected Dr. Taylor provoking ferocious stinging from an established colony, it plainly down plays the aggressiveness of the bee and its danger to the public. The tone is optimistic about efforts to modify its undesirable characteristics. However, thinking among researchers has been modified more than has the AHB since 1975. In the continuing effort to prevent an image of the AHB to the public that will instill neither panic nor indifference, the tone of this film is smugly self-confident. Recognizing its deficiencies and the fact that it was just plain out of date, the USDA commissioned a new film on the "killer bee" that was debuted at a major national beekeepers meeting earlier this year. Commercial beekeepers thought it was too alarmist and

Mr. John Lindner of Cumberland, Maryland, showe selection of slides of flowers and honeybee collected over his y of service as Maryland State Apiarist. The portraits of wild cultivated flowers of all seasons were a reminder of the sourc the joy as well as the commodity which beekeepers derive fr their craft.

Workshops held throughout the afternoon inclu candlemaking, which was conducted by Mary Lou Campbell. demonstrated ways that beeswax can be refined to make can and other craft-related items. Fern Wilson, a recognized exper the field of honey exhibition, prepared an excellent presentat on the preparation of honey for judging. Attending members t ended the evening with a chicken barbeque.

At next morning's breakfast, Dr. James Amrine gave interesting lecture on the crystallization of honey, delving into many properties which cause this phenomenon to happen. He a explained, in full detail, the art of producing cream hon Another interesting aspect of the program was a colorful pictor display given by Joseph Sendecky on the beekeeping indus behind the Iron Curtain of Czechoslovakia. After Jo presentation, a panel discussion was opened with lecturi

speakers designated for the panel. The attending beekeepers asked various questions ranging from beekeeping, into the many subjects lectured throughout the course of the meeting. Later that afternoon everyone participated in a field trip to an apiary for the Junior Beekeeping Contest and to be indoctrinated in migratory beekeeping.

Awards and drawings were awarded to many of the beekeepers who participated in events sponsored by the W.Va. Beekeepers Association.

could bring on restrictive regulation, so the USDA has shelved it.

The other two films were designed for junior high to adult audiences. "Life Cycle of the Honey Bee," produced by National Geographic Films, includes the excellent closeup photography of bee behavior and comb structure that is the trademark of that organization.

The principal speaker of the Friday morning program was Dr. James Tew of Ohio State University's Agricultural Technical Institute. Dr. Tew is in charge of ATI's commercial beekeeping training program and offered his reflections on the personality characteristics of beekeepers, a field which in his opinion has been vastly understudied. His own informal survey revealed that beekeepers tend in the majority to be male, rural dwellers with interests in nature-oriented hobbies such as bird-watching and other outdoor activities such as hunting. He admitted that the survey "fails to represent approximately half the people in this room, who have the misfortune to be married to the sort of person it describes."

Bard Montgomery delivered a report on the W. Va. Department of Agriculture apiary program, expressing satisfaction that in the previous fiscal year the employment of two full-time and four part-time apiary inspectors has allowed the program to accomplish its minimum goals of answering all requests for inspection and following up on all previously imposed apiary quarantines. He also thanked the members of the WVBA for their continued support of the program over the many years and announced his impending resignation.

Hive Ventilation

In the temperate areas of the United States, wintering honeybees are a constant problem. In an attempt to successfully winter their bees, beekeepers have tried a variety of techniques, from wrapping colonies in hay, straw, tar paper or foam insulation, to wintering indoors in cellars or specially constructed buildings. For a long time, collective wisdom deemed that it was of utmost importance to insulate the beehive against the cold. This, no doubt, was influenced by those who thought bees were attempting to warm the interior of their hive as human beings did their houses. This is not the case. The bees only attempt to warm a discrete cluster of individuals within the hive. Insulating practices often brought on other problems; especially vexing was that the air trapped inside the colony by insulation was full of moisture.

Experience and research now indicate that moisture-laden air is more detrimental to honeybee colonies in winter than cold temperatures. In colder reaches of the colony, the moisture can condense and may even fall back into the insulating layer of bees surrounding the cluster, producing an icy ball of bees. Therefore, conventional wisdom now dictates that insulation is not as important as venting excess moisture.

We as beekeepers are constantly barraged with information about how beneficial ventilation and moisture removal are in overwintered colonies. The upper entrance is always suggested as a method to accomplish this in winter and in very warm humid conditions during the summer. There have been many, many articles written on the upper entrance theme...Perhaps we as beekeepers should look more closely at the upper entrance as a more efficient option.

The need for adequate ventilation is also well documented during nectar flows. Some beekeepers provide upper entrances for bees by propping up covers or even placing elevation blocks at the four corners between the supers. These practices expose the combs to a large volume of air needed to reduce the excess moisture in nectar. Care in ventilating hives is always tempered by the possibility of robbing; care must be exercised by the beekeeper to provide maximum ventilation with minimum exposure to robbers.

For Your Information

Schedule of Beekeeping Events. The *Cabell-Wayne Beekeepers Association* will meet January 13 at 7 p.m. at the United Methodist Church at Lavalette, W.Va.

The *Morgantown Area Beekeepers Association* will meet February 6 at 7 p.m. at 1085 Agriculture Science Building in Morgantown, W.Va.

Varroa Mite Sampling. A monitoring program for the probable Varroa mite infestation in West Virginia is currently a joint effort between the W.Va. Department of Agriculture and the U. S. Department of Agriculture to gather samples and examine for the presence of the parasite *Varoa jacobsonii*. This parasite is an Asian mite that externally attaches itself to the bees and larvae. It is not known to be present in North America, but this survey is being conducted to detect its potential arrival. From July 1 to October 30, a minimum of three samples per county, totaling 165 samples statewide, were to be gathered, with an increase from 200 to 500 bees taken per apiary to allow for a sufficient number to be examined. During the month of November, the samples were examined by Tom McCutcheon under the supervision of the U. S. Department of Agriculture at the W.Va. University Laboratory at Morgantown, W.Va.

Honey Season. The honeyflow was very late and unusual this year, but it was also abundant, and most beekeepers throughout the State were satisfied with the crop. Usually most surplus honey is produced in May and June. However, supers were empty and some colonies were near starvation at that time this year. On approximately June 10, surplus honey began showing up in hives throughout the State, including one of the most abundant crops of basswood and sourwood yet seen. In general, the crop this year is very light in color. Later in September the goldenrod flow began, but was hampered somewhat by the dry conditions reported to exist in many areas of the State. It was reported in the *American Bee Journal* that honey crops were somewhat better this year, but the flows were quite spotty.

The wholesale honey market appears to be at a standstill, while retail sales are somewhat improved with the new honey crop being sold to consumers.

AMERICAN FOULBROOD (Cont'd. from Page 1)

larvae stretched out the full length of the cell, even if there is only one of them in a hive, represent just the tip of the iceberg, as the saying goes, in relation to the true disease situation in that hive. If we realize that by the time we see one cell of American Foulbrood in a given hive, the disease is rampant amongst the bees of that hive, and that there will be billions of spores that could infect other larvae in the hives, we realize the magnitude of the disease that bees in an individual hive must face. For a beekeeper to think that he can control the disease, even with therapeutic agents, such as the drugs we have available, once the disease reaches epidemic proportions in the hive, is only to fool himself.

Once a hive has American Foulbrood that is visually apparent to us as beekeepers, that hive is desperately contaminated with spores. The spores of American Foulbrood are very well developed to stay in the environment until the right host comes along. At Ottawa, spores have been stored for up to 40 years and are still virulent when fed to honeybees at the right stage of development. You can also take the spores and boil them for 20 minutes in boiling water and they will kill a larva when you feed it to them. ETO treatment has been tried as a fumigation treatment for American Foulbrood; and again, this creature is very resistant. It can withstand the ETO to a certain extent, and about 2% of the spores will survive the treatment and when placed in an environment of up to two-day-old larvae, the spores will germinate and produce the disease again.

How does the disease spread within a hive? The disease is spread by the adult bees trying to clean the cells in which American Foulbrood has died. The scales are very hard for the bees to remove and they must work at it continuously. The bees cannot tell that there are spores there anymore than we can, and they pick them up on their body and they become mixed with the food that is fed to the larvae. This becomes a self-perpetuating cycle for the American Foulbrood. If the individual larva in which the spores are growing is not detected and taken out of the hive before it reaches the prepupal stage, it will die and there will be another 20 billion spores within the hive for the bees to clean out. The spores can stay anywhere in the environment until they are reintroduced into a bee. They could be in the soil around the beeyard, where they have been dropped when a bee has been cleaning the hive and taking a scale out; the more probable source of scales to carry on the disease is from one hive robbing honey from another hive that has had the disease. It takes very few spores in the honey, which is then fed back to larvae at the right stage, to develop the disease within the new hive. American Foulbrood, in itself, does not in any way move about so that it can get to the proper environment. It must sit and wait until it is placed in the proper environment for it to grow. This adaptation of having billions of spores so that the chances of one or two being introduced into an environment where they can grow is an adaptation of the disease to our environment.

Our problem, as beekeepers, is that we do not care to have this organism growing and killing our bees in that early stage of their development. What we have to do is provide a clean environment in which those bees can be nurtured and reach adulthood. In the days before there were therapeutic agents to do this, the only method available was eradication of the disease wherever it was found. This led to the burning of any hive in which American Foulbrood was found. This was a good method, but it had limitations in that there were no ways to prevent the disease from attacking your hive if one of your neighbors in the surrounding

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AMERICAN FOULBROOD (Cont'd. from Page 3)

area had a hive succumb to American Foulbrood. When that hive weakened down, because of lack of bees, your good hive would then go there and rob the honey from it. This would perpetuate the disease in the community, and there was really no good control of the disease at that stage.

In the early 40's with the discovery of sulfathiazole, a new era developed in beekeeping. The sulfathiazole chemotherapy agents became widely accepted as a control agent for American Foulbrood. This drug, and one to be discovered in later years (Terramycin), work by putting a block in the digestion system of the disease as it tries to send out digestive juices to break down the larva so that it can absorb the material and grow itself. As it grows, it reproduces into another cell and these new cells reproduce again. The drug or chemotherapeutic material puts a block in the digestive sytem of the microorganism. It does not kill the American Foulbrood organisms, they are very much alive, but cannot digest the material of the larva, and thus are virtually held in suspended animation. Once the larva gets through the prepupal stage and pupates, these cells can no longer grow. Thus they stay in the bee through its life, and when the bee eventually dies, are deposited outside of the hive. As long as there is sufficient therapeutic chemical in the feed of each individual larva, these larva will not break down with American Foulbrood. The minute that the amount of chemotherapeutic chemical is not at a level to retard the growth of the American Foulbrood disease, it will go through to the stage where it kills the larva and you will have 20 billion spores again to contend with in that hive. Therefore, it makes more sense to remove that complete hive unit from your beekeeping operation than to take the risk that eventually it will break down again with American Foulbrood and spread those disease organisms amongst all of your hives within the vicinity.

You then ask the question, why do we recommend feeding of drugs to honeybees? The feeding of therapeutic chemicals to honeybees is only logical in a preventative sort of way. There are many possible sources of spores that could infect your individual clean hive. These spores could come from other beehives in the neighborhood, bee trees that have been in existence for years and possibly have had disease in them and even had colonies of bees die out there and left small amounts of honey which bees will find and rob out. Another possible source is from package bees or queens introduced to replace hives that have died. It has been proven by John Corner, former Provincial Apiarist of British Columbia, that disease can be spread by adult bees in packages. Thus, some spores could be presented to the larvae in the hives, but the number of spores when this first occurs would be very small. Therefore, if there were sufficient levels of chemotherapeutic drug in the hive so that the disease organism was kept from growing, it would then eventually be carried out of the hive and die before it could go through to the stage where it would produce significant numbers of spores that would reinfest the rest of the larvae in the hive. This gives the beehive a chance, through its natural biology, to get rid of these limited numbers of spores before they become a problem to the whole unit.

When the spore count has reached epidemic proportions, as it has when you find even a single cell of American Foulbrood in a hive, it is much wiser then to contain that infection by removing that complete unit from circulation. It would be very advisable to feed the rest of the hives in the yard for a considerable period of time with chemotherapeutic chemicals.

The other reason we are very concerned to remove any hives that visually show signs of American Foulbrood is that as the chemicals are used it is not inconceivable that we could select a strain of the American Foulbrood organism that is resistant to chemicals. If such a resistant organism were to be picked out of the natural population of American Foulbrood organisms and was not destroyed, we would no longer have effective control in the preventative side of American Foulbrood treatment. I do not think there are very many beekeepers who experienced the disease problems before the chemotherapeutic drugs were available who would not agree that they have made commercial beekeeping a viable business opportunity. We would not want to lose this excellent tool we have through someone inadvertently selecting a strain or mutant of American Foulbrood that is resistant to the drugs.

If we must maintain a level of chemotherapeutic chemical to be fed to the larvae in all the feed that they receive, how can this best be accomplished? We have available to us two excellent chemotherapeutic drugs in sulfa drug and terramycin. These are two different types of chemicals and their life-span is quite a bit different. One of the problems that we must face as beekeepers is that these drugs have also been used to a great extent for treatment of many organisms in human beings. There are, in the human population, many people who have built up serious allergies to these individual drugs. One of our concerns as beekeepers and producers of fine honey is that we do not contaminate our excellent product with a chemical which may cause problems to the consumer of the product. Therefore, we want to control the disease in the bees as much as possible without the risk of having these control agents reach the consumer of our product—the honey. The way we do this is that the honey is only produced over a very short period of time, in July and August. We do not recommend any treatment of honeybees with any therapeutic chemicals during this period, or the period just before the honeyflow. There should be no treatment of honeybee hives aft the 10th of June in any year. The greatest exposure to introducir American Foulbrood spores into a beehive is during those tim of the year when bees are likely to rob other beehives. This usual does not occur during the honeyflow period as beehives are bus bringing honey from other plants.

The greatest time of exposure is probably in the fall mont when the honeyflow is over, the colonies are fairly strong an those that have American Foulbrood are at a weaker point. Th strongest colonies will usually be the ones that will pick up th disease organisms. Thus, if the honey is taken off and sulfa drug fed back to the bees in sugar syrup, this is probably your be opportunity to prevent the spread of American Foulbrood b therapeutic means. Sulfa has a very long life. This is why it recommended that it be fed in the fall. This gives us coverage rig through until the spring feeding period. In the spring it is n recommended that you feed sulfathiazole to your bees. This cou lead to contamination of the honey, as it does not break down ve quickly. The feed that is put on in the fall will normally b consumed by spring. The therapeutic chemicals to use are th tetracyclines in the spring, usually referred to as terramycin. Thes should be fed either in syrup or in icing sugar, which is place along the end bars in the ledge created by the frame rest Terramycin is a fairly short-lived chemical, lasting up to abo four weeks, and will provide good coverage during that time f American Foulbrood, and also European Foulbrood. We ha not discussed the control of European Foulbrood, but terramyci will control this disease where the sulfa drug will not. It i therefore, recommended that you could also feed som terramycin in the fall if you have had any amount of Europea Foulbrood known in your area. European Foulbrood is not a resistant a disease and can be cleaned up with the use terramycin. It is also wise to put in a new queen that is from ve resistant bees if there are visual signs of European Foulbrood in particular hive.

The mixing of the drugs should be at the following rates: Sul drug should be mixed so that one pound is spread through 5 gallons of feed. Therefore, it does not take a very great dosage p gallon. One pound being 454 grams divided by approximately 5 gives us one gram of sulfa drug per gallon. Terramycin, if it is the formulation of TM25, should be mixed with four pounds icing sugar or other forms of powdered sugar such as drivert ar one level teaspoon fed every four weeks. Do not place the d powder directly on the brood, as the drug, if introduced direct into the cells, will kill the larvae and you will not ha accomplished control of the disease, but only led to the proble you were trying to prevent. One pound of terramycin should fe 100 hives at this rate. In order to keep a constant supply within t hive, you are into your bees more than once every three or fo weeks. You could reduce the volume of the treatment and tre them each time you had the hive open. You would normally into the hive three to four times into the spring and that can ma three treatments in the spring before the honeyflow occurs.

A warning here would be in order as beekeepers in Quebec ha lost their opportunity to use chemotherapeutic chemicals due misuse of them, and they have been found in honey produced Quebec. We will be monitoring honey in Ontario and if th situation were to develop here, the possibility exists that t chemicals could be withdrawn also. The admonishment is to u the chemicals, but use them wisely and do not contaminate t honey.

The **Beekeeping Newsletter** is written and compiled by Ma Cochran, Apiary Inspector, W.Va. Department of Agricultur Plant Pest Control Division, Cha 5.

BEEKEEPING NEWSLETTER
W.Va. Department of Agriculture
Gus R. Douglass, Commissioner
State Capitol
Charleston, WV 25305

October/November/December 1985

Address Correction Requested

Non-Profit Org.
U. S. Postage Paid
Permit 271
Charleston, WV
25301

David Mead
2804 Ranch Road
S. Charleston, WV 25303