

# The Buzz

The Education Hub for Practical Beekeeping

<http://aikenbeekeepers.org> January - February 2012

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Meetings will be the fourth Tuesday of the month at 7:00pm  
Our new location is Trinity United Methodist Church, 2724 Whiskey Road, Aiken, SC  
Please join us!

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Many thanks to David McNeely and Jim Irons, for their leadership as President and Vice President of our club for the past two years. Thank you both! *We appreciate your contributions and hard work in making Aiken Beekeepers a better club.*

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**Please welcome Allen Johnson as our new President and Leslie Davis as our new Vice President. Congratulation to both of you!! We look forward to your leadership and service in the next two years.**

## Presidents Bees-ness

## Buzz from the Hive

Happy New Year Fellow Beekeepers,

I have only a few comments to make this month. First I would like to say a real big thank you to David McNeely and Jim Irons for the leadership they provided the last two years as our president and vice president. Those are some big shoes to fill as they have done an outstanding job. Thanks gentlemen!

Second, I want to thank you, the Aiken Beekeepers Association for the confidence you've placed in Leslie Davis and myself as we try to grow into those big shoes we have to fill. With Karen and Deborah's help we hope to make the next year for our association as great as the last two years have been.

Lastly, just a short word about beekeeping. Our weather has been totally erratic this winter season. Don't be discouraged. Make sure your bees have the carbs, proteins, and water they need. Since the winter solstice, the queen should start laying more and the hive needs carbs and protein. You can help with the carbs by starting some 1:1 sugar water. But if your bees still have honey stores, these stores may need adjusting so the cluster has better access. If the colony has plenty of reachable stores, they need water to thin it down to make brood food so have accessible water for your bees. The proteins can be provided by nature almost entirely unless your wanting to give your bees a turbo boost. Some maples and other trees are already in bloom and bees are bringing in pollen. But, if you want a turbo boost add some pollen substitute by patty or by dry open feeding. Be careful with the patties. Most commercially made patties come in 1lb. sizes. You may want to only feed a half or fourth at a time. Don't give more than the bees can eat in a few days and place patties right over the brood nest or bee cluster.

So it's a New Year and the beekeeping chores are starting all over again. I can't wait to see what the season brings.

Allen Johnson

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The officer's numbers including new numbers for Allen and Leslie:

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Beekeeping is constantly evolving with what seems like a new pest or disease being introduced daily and other challenges that at times leave you shaking your head. It is a constant learning process to keep up with these challenges. Now more than ever before, we need strong associations of knowledgeable beekeepers. So I ask that you get involved by attending the meetings and volunteering wherever you can to help strengthen our club.

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## **Beekeeping Chores**

Beekeeping does not work by recipe, and an outline like this is no substitute for knowledge and experience. This section is provided primarily for new beekeepers or beekeepers new to the area and others who may want a synopsis of seasonal activities and expectations.

### **Beekeeping Calendar of Management Practices: January and February**

## **A Beekeeper's Calendar**

Here's a list by month of the various duties activities and chores that we have and will published. These suggestions will help keep your hives in good condition.

### **January**

January may be winter at its cruelest, but it is also the first sign of spring for the beekeeper. The first brood rearing begins in the hive and just like the world; the bees are beginning to think of good weather, nectar, pollen and freedom.

On sunny days with minimal wind and a temperature in the 40's, you may see bees taking their cleansing flights and preparing for spring.

In our area it is time to:

- Begin planning for the new beekeeping year. Review your colony records from last year to determine any changes or additions you would like to do.
- Visit your hives to check for wind or animal damage. Make sure the hive openings are clear so the bees can get in and out for the cleansing flights.
- Make sure the colonies have food. On nice days open the out covers and see if the bees are clustered and active around the inner cover hole. Several different options are open for feeding including dry sugar, candy boards or fondant.
- Review your equipment and make any repairs that are necessary and build any new equipment so you are ready for the upcoming year.
- If you aren't a member of a beekeeping club, join. It's a great opportunity to meet other beekeepers and exchange ideas, tips, thoughts and stories. This is in addition to the great topics and speakers. For more information on The Cook DuPage Beekeeper's Association and instructions on how to join, click here.

### **February**

February brings the hint of spring, with the reality of winter. During warmer years, the first maple and willow pollen may appear. The queen has been laying eggs and the hive is building brood, using up the stored honey supplies quicker to keep the brood warm.

In our area it is time to:

- Monitor the colonies food stores. The weight of the hive will provide some ideas on how much food is available inside. Feed those colonies low on stores with sugar, fondant, or place a candy board on the hive to help the bees through the remains of winter.
- Check for activity in the hive (look to see if the bees are taking cleansing flights during the warmer days, or listen to the hive to see if there's a buzz going on inside). Remember a grouping of dead bees on the outside is a good sign that there is life on the inside. If you do lose a hive see what may have caused their demise.
- Feed pollen cakes and patties to help build up the food stores and keep the hive strong.
- Help the bees with their housekeeping by clearing the dead bees on the bottom board out with a coat hanger or some other device (be sure to put the entrance reduce back on, you don't want any mice getting in at this point).
- AS the cluster grows, shift frames with eggs to the center and frames of sealed brood to the outer position.
- Reverse double brood chambers to move the empty frames to the top and center. This will stimulate growth of the hive.

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## Recipe Corner

### *Sparkling Honey Fruit Spritzer*

(6 to 8 servings)

1/3 Cup Honey

1 Cup frozen berries

1 Lime, thinly sliced

1 Orange, halved & thinly sliced 3 Cups Orange Juice

3 cups of Sparkling Water

Ice Cubes

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Combine Honey, berries, citrus slices, and orange juice in pitcher. Using a wooden spoon, press down on the fruit to juice and to mix fruit with honey. Cover and refrigerate for 2 hours or longer. Add sparkling water and ice when ready to serve; stir to mix. Red or White Wine may be added to Spritzer if desired.

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The honey bee population of North America is in decline. That fact has even acquired an acronym, CCD, Colony Collapse Disorder. A number of theories have been advanced as to why honey bees are dwindling, including viruses, mites, various fungi and deadly chemicals ... and here is one more.

**Thanks Shawn Gillis for submitting this article**

## The parasitic fly lays eggs in a bee's abdomen.

A heap of [dead bees](#) was supposed to become food for a newly captured praying mantis. Instead, the pile ended up revealing a previously unrecognized suspect in colony collapse disorder—a mysterious condition that for several years has been causing declines in U.S. honeybee populations, which are needed to pollinate many important crops. This new potential culprit is a bizarre—and potentially devastating—parasitic fly that has been taking over the bodies of honeybees (*Apis mellifera*) in Northern California.

John Hafernik, a biology professor at San Francisco State University, had collected some belly-up bees from the ground underneath lights around the University's biology building. "But being an absent-minded professor," he noted in a prepared statement, "I left them in a vial on my desk and forgot about them." He soon got a shock. "The next time I looked at the vial, there were all these fly pupae surrounding the bees," he said. A fly (*Apocephalus borealis*) had inserted its eggs into the bees, using their bodies as a home for its developing larvae. And the invaders had somehow led the bees from their hives to their deaths. A detailed description of the newly documented relationship [was published online Tuesday in PLoS ONE](#).

The team performed a genetic analysis of the fly and found that it is the same species that has previously been documented to parasitize bumblebee as well as paper wasp populations. That this parasite hasn't previously been reported as a [honeybee killer](#) came as a surprise, given that "honeybees are among the best-studied insects of the world," Hafernik said. "We would expect that if this has been a long-term parasite of honeybees, we would have noticed."

The team found evidence of the fly in 77 percent of the hives they sampled in the Bay Area of California, as well as in some hives in the state's agricultural Central Valley and in South Dakota. Previous research has found evidence that mites, [a virus](#), a fungus, or a combination of these factors might be responsible for the widespread colony collapse. (Read more about colony collapse disorder in our feature "[Solving the Mystery of the Vanishing Bees](#).") And with the discovery that this parasitic fly has been quietly killing bees in at least three areas, it might join the list of possible forces behind colony collapse disorder.

The parasitic fly lays eggs in a bee's abdomen. Several days later, the parasitized bee bumbles out of the hives—often at night—on a solo mission to nowhere. These bees often fly toward light and wind up unable to control their own bodies. After a bee dies, as many as 13 fly larvae crawl out from the bee's neck. The bees' behavior seems similar to that of ants that are parasitized—and then decapitated from within—by other fly larvae from the *Apocephalus* genus.

"When we observed the bees for some time—the ones that were alive—we found that they walked in circles, often with no sense of direction," Andrew Core, a graduate student who works with Hafernik and a co-author on the new paper, said in a prepared statement, describing them as behaving "something like a zombie." (Read about other parasites that turn their hosts into zombies in the article "[Zombie Creatures](#).")

Bees from affected hives—and the parasitizing flies and their larvae—curiously also contained genetic traces of *Nosema ceranae*, another parasite, as well as a virus that leads to deformed wings—which had already been implicated in colony collapse disorder. This double infection suggests that the flies might even be spreading these additional hive-weakening factors.

The research team plans to track bees with radio tags and video cameras to see whether infected bees are leaving the hive willingly or getting kicked out in the middle of the night—and where the flies are finding the bees in which they lay their eggs. "We assume it's while the bees are out foraging because we don't see the flies hanging around the bee hives," Hafernik said. "But it's still a bit of a black hole in terms of where it's actually happening." Most of the parasitized bees found so far have been foraging worker bees, but even if other groups of bees within a hive are not becoming infected, a decline in the number of foragers in a hive could have a large impact on a hive as a whole. Models of colony dynamics suggest that "significant loss of foragers could cause rapid population decline and colony collapse," the researchers noted in their paper.

Hafernik and his colleagues hope that the simple way they made their discovery "will enable professional and [amateur beekeepers](#) to collect vital samples of bees that leave the hive at night"—with a light trap, for instance—and keep them around for a week or so to observe for any signs of emerging larvae. Pinpointing the extent of this strange bee behavior could be key to stemming colony collapse disorder by possibly allowing keepers to isolate affected populations. If the parasitic fly is just starting to infect honeybee populations, this could be an important move, especially given the newly prevalent [mobile commercial hives](#), which mean that honeybees—and their ailments—are on the move in much greater numbers than ever before.

**About the Author:** Katherine Harmon is an associate editor for *Scientific American* covering health, medicine and life sciences. Follow on Twitter [@katherineharmon](#)



## CATCH THE BUZZ

### Roundup Ready Alfalfa Ready to be planted

From Country World Online

For the first time since 2006, Roundup Ready alfalfa has been planted, despite suits that aimed to block the action.

According to [Monsanto.com](#) the USDA's Animal and Plant Health Inspection Service completed the Environmental Impact Statement in December 2010, and in January 2011, authorized the resumption of sale and planting of Roundup Ready (RR) alfalfa. Now, with alfalfa planting season well under way, consumers will soon see higher volumes of RR alfalfa on the market.

For some in the organic community, this refuels concerns about cross-contamination with organic alfalfa fields, while others are looking forward to the possibility of a higher quality alfalfa product.

"One thing to keep in mind, is that all alfalfa is a product of a breeding and genetics effort," said Dr. Calvin Trostle, associate professor and Extension agronomist at the Texas AgriLife Research and Extension Center. "It is just the difference of Roundup Ready alfalfa, or other Roundup crops that they have introduced genetic material from other sources, outside of say an alfalfa plant, and the purpose of that genetic material could be insect control, could be disease resistance."

## CATCH THE BUZZ

Corn Seed Treatment As Lethal As It Gets For Honey Bees All Season Long, And Long After The Season Is Gone. It Just Keeps On Killing.

Alan Harman

Frightening new research shows honey bees are being exposed to deadly neonicotinoid insecticides and several other agricultural pesticides throughout their foraging period. The research, published in the scientific journal *PLoS One* says extremely high levels of clothianidin and thiamethoxam were found in planter exhaust material produced during the planting of treated maize seed. The work, which could raise new questions about the long-term survival of the honey bee, was conducted by Christian H. Krupke of the Department of Entomology at Purdue University, Brian D. Eitzer of the Department of Analytical Chemistry at the Connecticut Agricultural Experiment Station and Krispn Given of Purdue.

neonicotinoids were found in the soil of each field we sampled, including unplanted fields, they report. Dandelions visited by foraging bees growing near these fields were found to contain neonicotinoids as well. "This indicates deposition of neonicotinoids on the flowers, uptake by the root system, or both," the report says. "Dead bees collected near hive entrances during the spring sampling period were found to contain clothianidin as well."

The researchers also detected the insecticide clothianidin in pollen collected by bees and stored in the hive. "When maize plants in our field reached anthesis, maize pollen from treated seed was found to contain clothianidin and other pesticides; and honey bees in our study readily collected maize pollen. "These results have implications for a wide range of large-scale annual cropping systems that utilize neonicotinoid seed treatments," the report says. The research was funded by grants from the North American Pollinator Protection Campaign and the Managed Pollinator Coordinated Agricultural Project.

There have been red flags about pesticide exposure for some time and of the many compounds detected, the neo-nicotinoid group has received the most attention. As a group, neonicotinoids possess several key attributes that have seen their heavy adoption in both agricultural and urban environments, including low vertebrate toxicity and the ability to be translocated by plants.

**Neonicotinoids are also persistent, offering the potential for a large window of activity. The new report says the half-lives of these compounds in aerobic soil conditions can vary widely, but are best measured in months – 148 - 1,155 days for clothianidin.**

Among the largest single uses of these compounds is application to maize seed. Production of maize for food, feed and ethanol production represents the largest single use of arable land in North America, reaching a record 35.7 million hectares (88,216,620 acres) in 2010 and is expected to increase. All of the maize seed planted in North America except for 0.2% used in organic production is coated with neonicotinoid insecticides.

Two major compounds are used – clothianidin and thiamethoxam, with the latter metabolized to clothianidin in the insect. The application rates for these compounds range from 0.25 to 1.25 mg/kernel. These compounds are highly toxic to honey bees – a single kernel contains several orders of magnitude of active ingredient more than the published LD50 values for honey bees – defined as the amount of material that will kill 50% of exposed individuals, which ranges from 22–44 ng/bee for clothianidin (contact toxicity).

**In fact, the amount of clothianidin on a single maize seed at the rate of 0.5 mg/kernel contains enough active ingredient to kill more than 80,000 honey bees.**

"Soil collected from areas near our test site revealed that neonicotinoid insecticide residues were present in all samples tested, with clothianidin occurring in each field sampled," the research report says. "Herbicide residues were also found in these samples."

Extremely high concentrations of clothianidin were found in talc exposed to treated seed along with fungicides applied to the seed. Analysis of talc used to plant untreated seed found low quantities of the same pesticides, likely due to contamination and reflecting the difficulties associated with thorough cleaning of equipment between plantings. Direct sampling of anthers revealed that many of the same compounds were present in maize grown from treated seed, but in far lower concentrations. Collection of pollen from traps in the field showed thiamethoxam was present in three of 20 samples, while pollen containing clothianidin was present in 10 of 20 samples. Fungicides were also frequently detected: azoxystrobin and propiconazole were found in all pollen samples, while trifloxystrobin was found in 12 of the 20 samples. Maize pollen is frequently collected by foraging honey bees while it was available and maize pollen made up more than 50% of the pollen collected by bees in 10 of 20 samples. Samples collected again last year revealed some similar trends.

"Clothianidin was found on all the dead and dying bees we sampled, while the apparently healthy bees we sampled from the same locations did not contain detectable levels of clothianidin," the report says. "Atrazine and metolachlor were also found, providing further evidence that these bees were foraging near agricultural fields; as these herbicides are commonly applied prior to or during maize planting.

When sampled, the contents of wax combs removed from two hives at the same apiary, researchers found both clothianidin and thiamethoxam in pollen removed from both hives. Nectar did not contain either compound. The miticide coumaphos was found at low levels in each nectar and pollen sample as well.

**Both soil and dandelion flowers obtained from the fields closest to the affected apiary contained clothianidin and this could have resulted from translocation from the soil to the flower, from surface contamination of the flowers from dust, or a combination of these two mechanisms. Dandelion flowers growing far from agricultural areas served as controls and no neonicotinoids were detected.**

"These results demonstrate that honey bees living and foraging near agricultural fields are exposed to neonicotinoids and other pesticides through **multiple mechanisms** throughout the spring and summer. The potential for greatest exposure (and the period when mortality was noted), occurs during planting time when there is potential for exposure to extremely high concentrations of neonicotinoids in waste talc that is exhausted to the

environment during and after planting. Furthermore, we show that bees living in these environments will forage for maize pollen and transport pollen containing neonicotinoids to the hive. Pollen contaminated with levels of neonicotinoids similar to those shown in our results has been known to impair pollinator health,” researchers said.

The levels of clothianidin in bee-collected pollen the researchers found were about 10-fold higher than reported from experiments conducted in canola grown from clothianidin-treated seed. “Detection of clothianidin in pollen, both in stored pollen in cells and in pollen traps is a critical finding because clothianidin is even more toxic when administered to bees orally, with an LD50 of 2.8–3.7 ng/bee,” the report says. “Given an average weight of 80–100 mg/bee, some of our pollen sample concentrations exceed the oral LD50. This, combined with the result that our samples of dead and dying honey bees consistently demonstrated the presence of clothianidin, suggests that the levels of both clothianidin and thiamethoxam found in our sampling of stored pollen in May of 2011 may have contributed to the deaths of the bees we analyzed.”

**The results also showed clothianidin present in the surface soil of fields long after treated seed has been planted. “All soil samples we collected contained clothianidin, even in cases where no treated seed had been planted for two growing seasons,” the report says.**

During the spring planting period, dust that arises from this soil may land on flowers frequented by bees, or possibly on the insects themselves. Of potentially greater concern are the very high levels of neonicotinoids and fungicides found in the talc that has been exposed to treated seed. “The large areas being planted with neonicotinoid treated seeds, combined with the high persistence of these materials and the mobility of disturbed soil and talc dust, carry potential for effects over an area that may exceed the boundaries of the production fields themselves.”

“A key mechanism for honey bee exposure may occur during the period when maize is typically planted across much of the Midwest (mid-April through early May). At this time, the energetic requirements of honey bee colonies are increasing rapidly and pollen and nectar resources are being gathered for colony growth. Talc and soil dusts from planting are mobile and have the potential to contaminate any flowering plants that are commonly found in or near agricultural fields and are visited by honey bees, including dandelion. It is a preferred pollen and nectar source for honey bees during this period, when floral resources are relatively limited.”

Later in the season, when planting is largely complete, the researchers found bees collect maize pollen that contains translocated neonicotinoids and other pesticides from seed. Translocation of neonicotinoids into pollen has previously been reported for maize grown from imidacloprid-treated seed, but the researchers say the degree to which honey bees in their study gathered maize pollen was surprising. “The finding that bee-collected pollen contained neonicotinoids is of particular concern because of the risks to newly-emerged nurse bees, which must feed upon pollen reserves in the hive immediately following emergence,” they say.

“Lethal levels of insecticides in pollen are an obvious concern, but sub-lethal levels are also worthy of study as even slight behavioral effects may impact how affected bees carry out important tasks such as brood rearing, orientation and communication.” Also potentially important are the three fungicides found in bee-collected pollen samples – trifloxystrobin and azoxystrobin and propiconazole. Azoxystrobin and trifloxystrobin are frequently used in maize seed treatments as protectants and all three are widely applied to maize in North America, even in the absence of disease symptoms. These findings have implications both for honey bees located near these crops year-round, but also for migratory colonies such as almonds and other fruit and nut crops, the report says.



## Happy Valentine's Day

## Bee Safe and Warm this Winter!