



by JAMIE ELLIS

Gahan Endowed Associate Professor
of Entomology
Honey Bee Research and Extension Lab
Dept of Entomology and Nematology
University of Florida
jdellis@ufl.edu

Personal Protective Equipment for the Body

Honey bees sting. Tell anyone that you work with bees and they immediately ask, “Have you ever been stung” (well, they ask that right after they ask, “Are cell phones killing bees?”). It is the bee’s sting that causes most people not to want to associate with honey bees/beekeeping. After all, who would willingly work with an insect that can inflict physical pain? However, stings are a reality for beekeepers, a reality that must be addressed prior to one’s engagement in the profession. Fortunately, beekeepers have numerous options when it comes to protecting themselves from stings.

Humans interacting with honey bees have been wearing personal protective equipment (PPE) since their relationship with bees started. The allure of honey and other hive products was simply too great for man to ignore; so, man had to develop ways of working with bees to minimize stings. The evolution of beekeeper PPE was slow, often comical, and even remains stalled in many parts of the world. I was in a developing country years ago and the beekeepers there simply did not have the resources to purchase or even make PPE. One beekeeper poked two eye holes in the bottom of a shoe box and then rubber-banded the box to his head to protect his face while working his hives. This shows you the great lengths that one will go in order to interact with bees.

All beekeepers, aspiring and old-timers alike, have to confront the reality of bee stings and devise a game plan for working with bees. Some beekeepers take the “full space suit approach”, being suited up from head-to-toe to protect against the flying darts. Other beekeepers take the minimalist approach and would work their bees naked if public decency laws allowed. The good

news about PPE is that there is no right way to work bees, though there are good recommendations that should be considered.

Of course, personal safety is paramount and should always be considered when one is contemplating what to wear while working with bees. Honey bees are not domesticated in the sense that we have tamed them and bred out their wild tendencies. All colonies are capable of mounting a massive flying assault, assaults which can be unpredictable and even deadly if not handled properly. The vast majority of European honey bee races are considered docile if managed and handled appropriately. This fact, though, can lull people into believing that they need not use or even own PPE, that they are “bee whisperers” who can tame any colony. This is not a safe belief as it completely ignores hive “personality” which can change on a whim. Beekeepers of all levels of experience should recognize the sting potential associated with every colony and plan their use of PPE accordingly.

The amount of PPE to be worn/used depends on the individual. I know many beekeepers who only ever wear veils (me included). They find the suits and gloves too cumbersome, awkward, and at times, dangerously hot. That does not mean that suits/gloves have no place in bee husbandry. There are certainly times when one should be fully suited, especially when working abnormally defensive colonies (i.e. African honey bees). New beekeepers often are expected to wear full bee suits, but I know many professional beekeepers who do as well. PPE is a matter of safety and taste. I recommend that people wear what they are comfortable wearing, but that they own the complete set of standard PPE for times that it must be used.

I will note that new beekeepers especially are vulnerable to the opinions of other beekeepers when considering what PPE to wear. Working bees without any PPE is seen as macho or even necessary to prove one’s worth as a beekeeper. However, it can also be very dangerous. I always recommend that new beekeepers overdo their PPE and then back off as they become comfortable working with bees. Some individuals will never divorce themselves from full PPE and that decision should be respected.

On the other hand, I believe that I became a better beekeeper when I quit using gloves. People who wear gloves often handle colonies with less finesse than do people who do not use gloves. This is due to a simple fact – gloveless beekeepers have learned how to work a colony to minimize stings. They learned what behaviors/actions excite bees and they have eliminated those behaviors/actions from their own repertoire. Watching a person who does not wear gloves work bees reminds me of watching a conductor lead an orchestra. There is a melody and rhythm to their work. Regardless, I will re-emphasize that beekeepers should consider their safety and the safety of others when deciding how to approach their use of PPE.

Bee Veil

The first piece of PPE, and arguably the most essential, is the bee veil (Figure 1). Its purpose is simple: protect the head and neck area from bee stings. Though I have worked bees many times in the past without wearing a veil, I feel that veil-less beekeepers are taking a risk. Bee stings to the throat, mouth, nose, and eyes can result in significant injury and even death in some cases.

Veils come in all shapes and sizes, but



Figure 1: The bee veil. (A) A typical helmet protects the scalp area of the head and provides a structure from which the veil hangs. (B) The black screen mesh surrounds the face and often the back of the head. (C) A looser screen fabric often is found on the lower third of the veil. (D) This veil is secured to the body using long draw strings that wrap around the body from the back and tie in the front. University of Florida.

most share a basic structure. This includes a (1) helmet/hat/scalp-cover that goes on top of the head, (2) black screen mesh that surrounds the face and head, (3) a looser screen netting that goes around the throat and (4) some sort of fastener to fix the veil to the body (Figure 1). The more traditional veils have hard plastic, pith, or other types of helmets that are worn on top of the head. These protect the scalp from bee stings and they also provide the infrastructure from which the screen mesh is hung around the



Figure 2: Bees will crawl on the veil so it is important that all parts of the veil function properly and that the veil is secured tightly to the body. University of Florida.

face. The helmets are often vented and some contain hooks or other catches that keep the screen material from “riding” to the top of the helmet. Many new veils omit the need for helmets and instead, use a wired-cloth material to serve in place of the helmet. These, typically, are one-piece veils.

Regardless of the head covering, all veils contain screen mesh material that protects the face. The mesh is usually black, to reduce glare, and often made of metal, though mesh fabric is becoming increasingly popular. The black mesh usually goes around the front, sides, and back of the head. Some veil styles only include see-through black mesh in the face area.

Veils are always anchored to the body to prevent bees from crawling into the veil through the bottom (Figure 2). To that end, veils can be tied (more conventional) or zipped (becoming increasingly popular) to the PPE worn around the torso area. The value of tied veils is that they can be used on any outfit or even no outfit at all for the friskier beekeepers. The downside is that improperly-tied, and sometimes even properly-tied, veils are navigable by bees, which are able to crawl up from the bottom and into the veil. Zipper-anchored veils can only be attached to the suit/shirt that has the other half of the zipper track. So, they are limited in usability across multiple outfits. What they lose in transportability, they make up for with impenetrability. Zipped veils are nearly impenetrable to bees. I say “nearly” because the zippers on a zipped veil meet and often leave a small hole at the meeting junction. Most manufacturers of suit/veil combos cover this hole with Velcro material. Furthermore, tears in the veil fabric allow bees into the veil, despite how well it is zipped to the body.

I want to reemphasize my statement about the vast diversity of veil styles. Some are made only of screen fabric, making them foldable, collapsible, easily packed away, etc. Others are huge, bulky, etc. Some tie in the front, others in the back. Some keep the screen mesh away from the face, while others put it very close to the face. This diversity in styles allows beekeepers to choose the type of veil that best meets their needs.

Bee Suit

The bee suit, as the name implies, covers the entire body to protect the torso, midsection, legs and arms from stings (Figure 3). Bee suits usually are made of tightly woven fabric, though other materials are becoming increasingly popular. They are typically white for two primary reasons: (1) dark suits are hot to wear and (2) bees sting dark colors when the defensive response is initiated. Many newer-style suits offer added ventilation so that beekeepers do not overheat while working colonies during the warmer months.

Bee suits are not impenetrable to bee stings. That is why it is generally a good recommendation to get a suit one size larger than what you would ordinarily wear. For example, use an extra-large bee suit if you typically wear large clothes. The bagginess keeps the fabric from being held close to the skin. This is important because a sting is less likely to reach the skin if pushed into the baggy fabric.

Today’s bee suits come complete with multiple pockets and other stylish features. For example, they typically have elastic at the wrists and ankles to ensure a snug fit. They sometimes have access panels in the sides which allow you to put your hand through the suit and into pockets you may have in your undergarments, i.e. shorts or pants worn beneath the suit. They also come in all shapes and sizes, even for children.

Many beekeepers discover that suits can be replaced with pants and long-sleeve shirts which offer similar protection from stings. Consequently, suits are often the first or second piece of PPE that beekeepers forfeit as they gain experience working bees. That, of course, is not always true as many commercial beekeepers find that suits offer the best protection when working hundreds of colonies a day.

Bee jackets are a great substitute for full bee suits. They are made of the same material as full suits, but they only cover the head and torso area, not the midsection (groin area) and legs. Jackets are a great compromise for the beekeepers who desire the protection of full suits, but want to be able to get in/out of beekeeping PPE quickly. Many of today’s suits and jackets can be purchased as suit/veil combos. Veils in this situation are usually fastened to such suits with zippers.

Bee Gloves

As the names implies, bee gloves (Figure 4) are worn to protect the hands, wrists and usually the forearms from stings. Tradition-



Figure 3: The full bee suit. Notice that the suit is white, contains numerous pockets, and that my sleeves are rolled up on the right. Note also that the PhD student (left) has the umbrella while his supervisor (right) is in the open rain. What's wrong with this picture? University of Florida.

ments of bee work (removing supers, working defensive colonies, etc.).

On the other hand, wearing gloves can be a sting liability for a couple of reasons. First, alarm pheromone can accumulate on gloves when bees are attacking, thus making the gloves more attractive to stinging bees. Second, beekeepers who wear gloves often work colonies more roughly than their gloveless counterparts because they are numb to the defensive reaction exhibited by the bees. There is never a pressure to be gentle while working colonies since gloved beekeepers do not pay the price (i.e. get stung) when they are too rough with a colony. There is probably some truth in the belief that gloveless beekeepers know how to work a colony in a way to minimize the bees' defensive response because they learned what it took to keep the bees calm.

Many beekeepers have discovered that there are a few alternatives to bee gloves. For example, I know beekeepers who use the standard work glove that can be purchased at the local hardware store. They tend to be cheaper, durable, etc. However, they do not have the gauntlet that covers the forearm and often are difficult to secure to a shirt or bee suit sleeve, a major liability if you are trying to keep bees out of the glove. Other beekeepers have used latex gloves, dishwasher gloves, etc. Worth noting is that most bee gloves DO NOT meet the requirements stated on labels for pesticides that must be applied while wearing hand protection. In other words, they often should not be used to apply the hive products typically used against the major bee pests (particularly *Varroa*).

ally, bee gloves have leather hands and stiff fabric gauntlets, the latter which protect the wrists and forearms. However, gloves come in many styles and can be fabricated from different materials. Rubber gloves, for example, are becoming increasingly popular though they can be quite hot to wear. Most leather/cloth gloves offer a ventilation panel midway up the gauntlet, thus allowing fresh air to reach the hands. Most gloves have elastic around the base of the gauntlet, help-

ing the glove to be held securely to the arm, usually around the elbow area. They can be further secured to this area with tape if there is a risk of bees entering the glove at this area, especially as the gloves age and the elastic relaxes.

Like bee suits, bee gloves are not impenetrable to stings. I have been stung many times while wearing gloves. However, gloves do offer reasonable protection from stings and are advisable for intense mo-

Foot Protection

The feet and ankles are vulnerable to bee stings. I offer here a few recommendations worth considering when deciding how to protect these areas with PPE.

1) Spend the money and buy boots to protect your feet. I recommend waterproof boots since beekeepers regularly find themselves in wet fields, walking through mud puddles, etc. It is best not to buy black or other dark-colored boots, an admitted difficulty considering that most are brown/black.

2) High top boots/shoes are best because they cover the ankles. Typically, low-top shoes or sandals are not advisable as they make it easy for bees to sting the ankles.

3) Secure the suit- or pant-legs to the boots either using Velcro-type material, rubber bands, etc. or by tucking the bottom of the legs inside the upper part of the high-top boots.

4) Do not tuck your pant- or suit-legs in to long socks. This arrangement typically leaves a single layer of fabric around the ankle area, which stinging bees always seem quick to exploit.

5) Wear thick, light-colors socks. Remember, defensive bees attack dark colors.

Of course, the amount of PPE worn is at the full discretion of the beekeeper. However, it is advisable to own and have the full assortment of PPE with you any time you



Figure 4: A bee glove in action. The hand cover for this glove is made of leather while the gauntlet (the part that covers the wrist and forearm) is composed of stiffer, tightly woven fabric. The gauntlet contains a vent panel (arrowed) to provide fresh air to the hands. University of Florida.



Figure 5: The fully suited beekeeper. This veil, a different design than that shown in Figure 1, is zipped to the suit, providing ultimate protection from bees which otherwise might accidentally enter the veil from the bottom. University of Florida.

work colonies. Colony behavior is unpredictable. Even the calmest of colonies can exhibit heightened defensive behavior when provoked.

Consistent with this, beekeepers should never be ashamed of wearing PPE. The opinions of others should not matter when it comes to safety and comfort. It is important to feel safe and secure while working bees in order to get maximum enjoyment from the craft. For some, that means only wearing a veil. For others, that includes wearing the entire suit, gloves, veil, and boots (Figure 5). Safety first. Comfort second. You will enjoy beekeeping a lot more if you remember both of these points.

Honey Bees 101:

The "European" honey bee

There are 9 recognized species of honey bees today and all but one of those species occur exclusively in Asia. The one species that naturally occurs outside of Asia, *Apis mellifera*, has a natural distribution in Europe, Africa and the Middle East. This bee collectively is called the "western honey bee" and it is the bee that is present in the Americas.

The western honey bee does not occur naturally in North or South America. Instead, they were brought to these two continents hundreds of years ago by early European settlers. There is only one non-European race of western honey bee present in the Americas and it is the "African" honey bee. I note that there are actually many races of African honey bees, so it is a bit of a misnomer to call the one race we have in the Americas "the" African honey bee.

In scientific nomenclature, the race name

is written in italics behind the species name. European races may be referred to by their race name or common name. For example, the European honey bee race native to Italy is called *Apis mellifera ligustica*, with *ligustica* being the race name. This bee is commonly called the "Italian honey bee" or simply "*ligustica*".

There are many races of European honey bees, with the Italian honey bee being the most widely distributed outside of Europe because of its docile nature, propensity to produce strong colonies, and honey-hoarding behavior. However, other European races can be found in the U.S. For example, the Carniolan bee, *Apis mellifera carnica*, is a popular bee in the U.S. as is the Caucasian bee, *Apis mellifera caucasica*. The "German" or "black bee" was one of the original European races brought to the U.S., but it is harder to find in the U.S. today.

All European races have different phenotypes or traits. Some are dark, while others are lighter in color. Some hoard propolis, while others do not. Other traits, such as swarming tendency, defensiveness, honey-hoarding ability, colony size, ability to survive winter, etc., vary among the races. This great diversity is what makes European honey bees so valued by beekeepers. It is important to note that much of Europe has a temperate climate, though the climate can vary from Mediterranean to nearly arctic. This is noteworthy because the various European races are adapted to survive best in the climate in which they originate. It is no surprise then that European races of western honey bee do not perform as well in tropical/subtropical climates in contrast to their African honey bee counterparts. Regardless, European honey bees generally perform well in North America and they are the bees with which we have the pleasure to work.

BeeDun

Pushes bees out of honey supers for an efficient honey harvest.

Pleasant smelling

Non-toxic - contains no alcohol

www.BeeOlogy.com

RoyalQueens
Quality Northern Calif. Queens
Spring thru Fall
Joe & Sandy Roy
Valley Springs, CA 209/304-9968

Bee Smart
DESIGNS
1-800-600-7446

The Ultimate Feeder/Waterer

NEW!

Beekeeper Friendly Design

- 1 gal tank is easy to fill and place on base.
- Automatic valve maintains uniform syrup level
- Fits all 8 and 10 frame equipment, medium or deep hive bodies.
- Easy to clean - virtually maintenance free.
- Can be used as a feeder or waterer.

516-741-3062 • 1-800-600-7446
195 Atlantic Avenue • Garden City Park • New York 11040
www.beesmartdesigns.com

Honey Land Farms
Garry Oreskovic
Phone: (352) 429-3996
Email: honeylandfarms@aol.com
22146 O'Brien Road
Howey In The Hills FL 34737

Carniolan, Italian, VHS Queens
Excellent Honey Producers

Fumidil-B Fed Colonies and Nucs
Prompt Service Guaranteed

QUEEN CELLS AVAILABLE FROM FEBRUARY THROUGH APRIL

Terms: 10% deposit with order.
Balance due 2 weeks prior to shipping.

PACKAGE BEES AND NUCS WILL BE DELIVERED TO MI AND WI IN APRIL AND MAY

VISA MasterCard