

Honey Bees at 4H Camp Kidwell

This is a proposal to establish a Beekeeping program at 4H Camp Kidwell, 39000 1st Ave, Bloomington, MI 49026. Items addressed in this proposal include:

1. Potential of safely housing honey bee colonies on the property where they could be utilized for scholastic learning,
2. How honeybee colonies could be used to aid scholastic learning, and
3. What the cost of such a program would be.

We have looked around the property and considered the other activities for which the property is used. Desirable attributes of the apiary or bee yard (place where colonies are to be kept) include: a location where the honeybees will not interfere with normal utilization of area around them, close to camp buildings so that they can be easily utilized for instruction, a place where they are regularly observed so that problems or vandalism can be noted quickly, integrated into the campus so that they do not cause problems for maintenance staff, and a location that is good for the bees.

Introduction to Honey Bees

Honeybees provide pollination for local flowers at the same time they produce honey for themselves, and hopefully some for the keepers. It has been estimated that the presence of a honey bee colony increases the seed and fruit set in the area equivalent to spending \$3500 on bird seed. Bees do sting but normally only when they perceive an attack on their home. This generally requires some disturbance of the hives themselves but can occur from running a lawn mower within ten feet in front of the hive entrance in their normal flight path. Generally, the only dangerous sting to a human is one to the eye so veils are always recommended for working the hives. Only one person in 10,000 is highly allergic to a honey bee sting.

Honeybees are feral creatures. They are not domesticated. They are not dependent upon man for their continual survival. They are not owned or possessed except when within the hive. They behave the same whether they are living in a custom hive or a hollow tree. A Nassau County, NY attorney stated that anyone going outdoors should expect to come in contact with venomous stinging insects so that adding honey bees to a county park for pollination of community gardens there would not be a cause for liability concern.

The property owner with honey bees is somewhat protected because of this status. He generally cannot be held liable for bee stings away from the colony, even if it were proved that it was his bee. (Branding is not currently practiced.) Liability is dependent upon proof of negligence so it is best to have a written record of maintenance of the honeybees, and the considerations given to the establishment of the colony.

Honey bees need a spot to catch the morning sun (to get them up and moving). The bees typically take off from the hive and quickly fly up to 35 feet before heading off to the area where they are foraging. There, they drop down to the flowers, forage for nectar or pollen, rise back to 35 feet and fly home. The

area about ten feet in front of the hive is generally desired to be clear of obstacles as the bees usually use this as the rise area in taking off and the glide slope area when coming in for a landing. As there are few flowering plants in the main camp area, there will not be much change in noticeable bee population on the camp grounds. Many of today's domesticated flowers have lost their attractiveness to bees for pollination.

We recommend that weed blocker be put down in an area about 25' square and covered with wood chips to keep weeds down and reduce maintenance. This area should be surrounded with a simple plastic construction fence and signs to warn visitors of the presence of the honey bee colonies. The hive stands (concrete blocks) will be positioned about 10 feet from the back of the bee yard for ample gathering space for the students to gather behind the hives for instruction. The plan is to maintain two hives at all times with potential increase to four for overwintering. This will allow the program to continue as self-sustaining with normal losses.

Bees are living things. They are susceptible to various poisons. Thus, if the trees or yard are to be sprayed, the applicator should be alerted to the presence of the honey bees.

Between five and ten full-sized colonies could easily be kept in an area such as the camp without over grazing in this mixed agriculture and suburban environment. A colony is one family of bees in a stack of boxes. The family consists of one queen, maybe a couple thousand drones (males), and several thousand workers (immature females).

The beekeeper will need to check the yard frequently to assure the hives have not been damaged by storm or vandals. Generally, hives need to be opened for inspection every two weeks during the spring and summer months and at lower intervals during the remainder of the year. Hives can be managed to minimize swarming, which is the bees' method of reproducing colonies but we don't know enough about them to guarantee that it won't happen. Swarming is generally not a threat to people because the bees are quite docile during swarming. Bait boxes can be placed around the apiary to try to trap any swarms that are in the area, either from this apiary or locals.

Honey bees are good tenants. They pay their rent in honey. Honey is generally extracted in mid-summer to early fall with a yield of thirty to sixty pounds per hive in good years, zero in poor years. This is not a lot economically, but the experience can be rewarding in other ways.

Preferred Location at Camp Kidwell

After reviewing the camp, we are recommending that the bee yard be placed on the south side of the tree line on the south side of the main camp driveway but on the north side of the road that surrounds the activity field and parking lot near the horse paddock. This is a location that is about 30 feet back from the road where people often walk. It is a place easily seen from the Camp Director's home and regularly seen in normal camp activity. (See Figure 1)



Figure 1. Recommended Bee Yard Location at Camp Kidwell.

They need a fresh water source within 1/4 mile but it is preferred to have a fresh water source within a hundred yards to prevent trouble with neighbors by having bees visit their pool in suburban areas. The lake is an excellent watering site for honey bees as it is stationary and the bees can gather water at the edges or land on plants and walk down to the water. It is about 300 yards away so we would recommend that a watering site be set up at the apiary to provide constant availability of fresh water close by. This is to prevent the bees from forming a habit of visiting the horse troughs on the far side of the field.

We recommend a small, 3' diameter wading pool with holes drilled in the side at about 3" depth, a pile of sand in the center tapered from 5" at center to 0" at edge and a 4" X 8" X 16" solid concrete block set on top of the sand pile. Over time the sand pile will slump but careful attention will maintain the block and some sand is always above the water level and an area of taper to zero is maintained. This will allow rain to supplement manual filling with fresh water periodically and the sun to warm it so that it is more attractive to the bees. This pool should be maintained from April 1 through November 1 each year. This is due to the fact that bees will form habits and stick to them for a consistent water source but abandon one that is not dependable.

We believe that this location will be an excellent location meeting the needs of the bees, provide regular monitoring without extensive side trips, provide efficient access by students in classes, provide sufficient isolation from normal camp areas for safety, and provide easy access for the beekeeper.

How honeybee colonies could be used to aid scholastic learning

Honey Bees have been important to man since the earliest of times. Initially it was the robbing of wild colonies for the honey as sweetener and carbohydrate source. They were later managed and transported from their native home in Europe across Asia and even to the New World both for the honey and for managed pollinators. Today's agriculture would not be possible were it not for the honey bee as a managed pollinator.

The camp program includes both fun and educational activities. Since 4H is focused on agriculture endeavors and Michigan has significant fruit and vegetable agriculture, it is a natural extension of the camp program to introduce the campers to the honey bee as a managed pollinator.

An apiary on the camp grounds helps introduce the campers to the bees just in their presence seen in normal camp activities. There is also an opportunity to take a field trip to the bee hives where the beekeeper can pull a frame of bees from the hive and walk along the fence, showing a frame of bees, possible showing the queen, workers and drones. A frame of brood could be shaken to remove the bees and then passed around the class letting each child hold the frame and look deep into the cells to see eggs, young larva, and sealed pupal cells. Stored honey and pollen could also be pointed out at this time.

The importance of bees is illustrated by figure 2 where the dairy and produce areas of a grocery store are shown with and without bees in the photos. Nineteen Billion Dollars' worth of agriculture crops in the United States are pollinated by honey bees. It is estimated that 9 of 10 mouthfuls of food that we eat depended on honeybees for at least one stage in development.

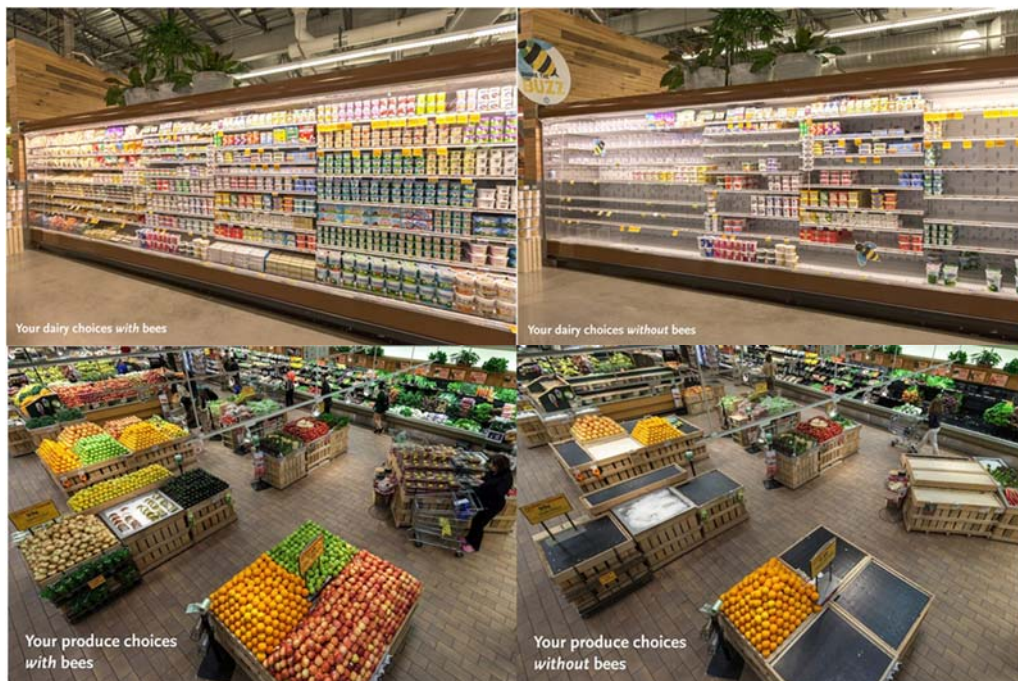


Figure 4. Grocery store Dairy and Produce with and without Honey Bees.

There has been more written about honey bees than any other animal other than man. Today, we are learning more about all of life by intensive studies of honey bees. Biology is a growing profession. The introduction of honey bees can be a point of inspiration to students to the importance of biology and may be the start of a life-long hobby or profession.

We would recommend that a visit to the apiary be scheduled for each camp group throughout the summer. This should include a short talk on the importance of honey bees in agriculture. This would expose over 300 campers to the honey bees every year. We would also recommend the establishment of a camp group interested in honeybees be run each August. This camp would focus on training on starting and maintaining honey bees as a hobby. This camp could start at fifth or sixth grade. We could plan on normal classroom and bee yard activities with a class size between 10 and 20 students. The students could be involved in the extraction and bottling of the honey. This is a task that needs to be done on an annual basis and can be used to show the students the processes that are involved in any production activity.

The apiary at the camp could be used as a focus to use the camp for an evening or Saturday program on keeping bees. There are no 4H clubs in Allegan county focused on honey bees. This could provide an opportunity for a club based at the camp using the apiary as a training center.

Having the honey bees at Camp Kidwell also provides the opportunity of using the perimeter fence as a mounting point for multiple educational posters and placards giving insight into the complex world around us including insect life, pollination, and foods.

What is the cost of such a program?

It is generally recommended to maintain a minimum of two colonies of bees if bees are to be kept. The reason for this is that seasons vary and it is difficult to know if the bees are doing well or poorly unless there is some opportunity for comparison. It is true that both could be doing equally well or poorly but two hives give some opportunity for comparison. Bees are living creatures and they seek to grow. We generally consider a bee colony as a super-organism, composed of many individuals. They can outgrow the provided space and will be prone to split (swarm) if they become too crowded. It is thus necessary to have spare equipment on hand in case the need arises.

The queen is a critical member of the family and can suffer many complications. It is generally a good idea to maintain a nucleus colony with a spare queen. We are currently losing 50-75% of our bees every year due to the introduction of the Varroa mite, Varroa Destructor, into our country and the European Honey Bee from a transfer from the Giant Honey Bee of Southeast Asia. Thus a spare nucleus colony is valuable insurance against loss. Due to the losses, it would not be unreasonable to manage the colonies to go into winter with a minimum of four colonies to provide greater hope for two surviving the winter. Extra bees can always be combined to reduce the number of colonies and yield greater honey production or sold to supplement the maintenance of the program.

We say that there are two kinds of beekeepers: Those who have bad backs and those who will have bad backs. Bee boxes can get heavy. A ten-frame deep box can weigh 100 lbs. I recommend that hobbyist

beekeepers never buy a deep box but maintain only eight-frame, medium boxes. These boxes top out closer to 40 lbs. This does require more boxes but they are common for both brood management and honey production, simplifying inventory. An eight-frame hive composed of medium boxes, managed for honey production, should reserve three boxes for brood and have four reserved for honey storage. Wintering of four eight-frame colonies should reserve four boxes per colony for sufficient honey reserves. Thus, I would recommend that the apiary have equipment including a minimum of 16 medium eight-frame boxes and ancillary bee hive equipment of bottom board, inner cover, outer cover, hive straps for five hives (one of them the spare nucleus hive). Beekeeper equipment should be provided for two beekeepers. With start-up bees, the cost of ten simple veils, the bee yard and hive stand construction a range of \$2000-2500 should be allocated.

Storage for the spare unused equipment and the beekeepers equipment must be provided. We may want to look into the addition of a simple garden shed for the storage. It would be expected that the extraction equipment would be borrowed/rented from a beekeeper to avoid the cost to this expensive equipment and the requirement to store it as it is large.

Ideally, once established, an apiary is self-sustaining with annual honey yield as the benefit. We would recommend that any honey produced be bottled in 8 oz bears and sold in the camp store as a source of funds for the maintenance and expansion of this program.

Emergency Plan

An emergency plan should be put in place with planned responses for:

- Observed hive damage either due to storm or vandalism
- A Swarm emerging and resting on the property
- Aggressive behavior by the bees, generally in response to a disturbance.

This emergency plan should include contacts, equipment location, and recommended actions.

Recommendations

This bee yard location should be reviewed by the Maintenance staff to determine impact upon their normal maintenance activity in the area and the expected impact of these changes. They can also determine if they can provide the modifications of hive stand, gate additions, and weed blocking preparation.

I would be happy to answer any questions relative to my recommendations contained within this report. Should you decide you would like to proceed with this, I would be happy to prepare an itemized list of equipment and a quote.

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