

# **BEE FEED**

## **FROM A BEE FRIENDLY**

### **COMPANY, Inc.**

#### ***Honey***

***Despite the fact that on first observation it would seem obviously correct, honey is not the best feed for bees. Honey is in essence bee food that has been processed so that it won't spoil. When given the chance, bees prefer to eat nectar. When honey is used as a feed, or within one of the following recipes, be sure to know the source. If at all possible only re-feed honey to the same hive it was harvested from. Never use store-bought honey. Store-bought honey may contain AFB (American Foul Brood) or other such spores, which are perfectly safe for human consumption but can be deadly to bees.***

#### ***Sugar Syrup***

***One of the reasons to keep bees is because you can harvest the honey that they create. After a honey harvest, it may be necessary to supply bees with an artificial honey replacement or with a source of artificial nectar, in order to prevent starvation. At other times when real nectar may be scarce or unavailable, artificial nectar can be used to encourage the drawing of comb or to aid in the rearing of brood. It***

***should also be noted that honey contains materials that bees can not digest and sugar syrup makes for a better source of bee feed. This does not mean that it is appropriate to take all of the bees' honey. After all, the bees did work rather hard for it. Bees should always have excess honey in storage.***

***When using sugar, only use white cane sugar. Don't used raw sugar, brown sugar or molasses as they contain impurities that may harm the bees or may be difficult for the bees to digest. If using powdered sugar instead of standard crystallized cane sugar, be sure to check the ingredients list as some powdered sugar contains anti-caking agents that might be harmful to bees. Although the following recipes call for ingredients by weight, volume is a close enough approximation as the bees don't particularly care about the specifics of sugar concentration.***

***Note: At its most basic, and as an aid for you to figure out any volumes, remember that:***

***1 gallon water = ~ 8lbs.***

***In more specific detail: Weight of water = 8.34 lbs(#) per gallon; 1/2 gal = 4.14#; 1qt = 2.09#; 1pt = 1.04#; & 1 cup = 0.52# of water.***

***From this you can easily get any volume of syrup at what ever mix you may need.***

## ***1:1 Syrup***

***1:1, or One-to-One syrup can be used for supplemental spring feeding and encourage the drawing of comb.***

***☐ 1 part (by weight) sugar***

***☐ 1 part (by weight) water***

***Simply stir sugar into room temperature water until all the sugar has dissolved to produce the desired quantity. The dissolving process will be sped up with hotter tap water, just be sure not to boil the sugar solution. One volume of water plus one volume of sugar when prepared equals roughly 1.5 volumes of syrup.***

***Therefore. one 2-liter (~1/2 gal) bottle of water plus one cup of water plus 5 pounds of sugar yields just under two 2-liter bottles of "close enough" 1:1 Syrup Made in a 5 gallon pail: 3 gallons of water (@ ~25lbs) , +25 lbs sugar = 4.5-5 gal. 1:1 syrup.***

## **2:1 Syrup**

***2:1, or Two-to-One syrup can be used for fall feeding after the last honey harvest, or if the bees do not have a sufficiently large store of honey.***

***☞ 2 parts (by weight) sugar***

***☞ 1 part (by weight) water***

***The two parts sugar will not dissolve in room temperature water. Because of this mixing difficulty it is advisable to mix the sugar into near-boiling water. Do not allow the sugar mixture to boil, as this will give the chance for some of the sugars to caramelize, creating a partially indigestible and possibly even toxic solution as far as the bees are concerned. Be sure to let the solution thoroughly cool before feeding it to the bees. It was once common practice to add cream of tartar (tartaric acid) to 2:1 syrup to prevent re-crystallization of the sugars, however this is not recommended, as it is believed to shorten the life spans of the bees that consume it.***

***Made in a 5 gallon pail: 2.5 gallons of water (= 20+ lb) , +20 lbs sugar = 5 gal. 2:1 syrup.***

***Made in a 6 gallon pail: 3 gallons of water (@ ~25lbs) , +50 lbs sugar = 5+ gal. 2:1 syrup.***

## ***1:2 Syrup***

***1:2, or One-to-Two syrup can be used to stimulate brood rearing by simulating a nectar flow.***

***☞ 1 part (by weight) sugar***

***☞ 2 parts (by weight) water***

***Simply mix the sugar with room temperature water and feed the bees.***

### ***High Fructose Corn Syrup***

***It is not uncommon for a beekeeper with many hives and little time to use high fructose corn syrup in place of 2:1 syrup, however this method is not cost effective or practical for small-scale beekeepers. When purchasing high fructose corn syrup not specifically packaged as bee feed, be sure to check the list of ingredients. Many suppliers often add extra ingredients that may not be desired when feeding bees.***

***A few websites referring to the danger of feeding honeybees high fructose corn syrup, since***

***overheating it during manufacture turns some of it into a compound toxic to honeybees:***

***<http://www.sciencedaily.com/releases/2009/08/090826110118.htm>***

***[http://www.naturalnews.com/027286\\_HFCS\\_food\\_honey.html](http://www.naturalnews.com/027286_HFCS_food_honey.html)***

***<http://eatdrinkbetter.com/2009/08/20/the-bee-problem-is-hfcs-to-blame/>***

***Does this mean that high fructose should be sold only if it is already labeled with how much of that compound it contains?***

## **Bee Candy**

*Occasionally it is not advised to feed bees syrup. Sometimes, when emergency feeding, it is best to use a dry or semi-moist food, other times bee candy is used as it is less messy than feeding syrup. Even though bee candy may be convenient to use as feed, it is not recommended as a complete substitution to syrup.*

## **Un-prepared Sugar**

*The simplest bee candy is crystallized cane sugar. Pure sugar, while easy to handle, is generally only fed during dire emergencies, and bees sometimes will carry it out of the hive rather than consume it.*

## **Fondant Bee Candy**

*Fondant bee candy can be fed directly to the bees once cooled. It is also common to use this recipe in small quantities to plug the hole on a Queen Cage .*

**☞ 4 parts (by volume) white sugar**

**☞ 4 parts (by volume) 2:1 Syrup or High Fructose Corn Syrup , or honey**

**☞ 3 parts (by volume) water**

*Boil water and slowly add the syrup and sugar until dissolved.*

*Continue heating until the mixture reaches 238°F (114°C). Allow the solution to cool (without mixing) until it is slightly warm to the touch.*

*Begin to mix and aerate the solution; the color should lighten. Pour into shallow dishes or mold and save for later use. (we like to use muffin pans. The cakes work well and fit right in our 3" feeding tubes)*

**Quick Candy** *(not great, but used in a pinch)*

*In a pinch quick candy can be used in place of Fondant Bee Candy, it is easier to prepare, but may not be as easily workable.*

**☒ 1 part (by volume) confectioner's sugar**

**☒ 1 part (by volume) 1:2 Syrup or High Fructose Corn Syrup or Clean Honey**

*Simply knead the two ingredients together like bread dough until completely integrated.*

*NOTE\* Confectioner's sugar may contain corn starch - use a blender to make powdered sugar from granulated crystals for use in the bee hive.*

## ***Bee Candy on a Candy Board***

**☒ 15-16 lb. of sugar**

**☒ ~3 cups water**

**☒ 1 tbsp. plain white vinegar (optional)**

**☒ 1 Pollen patty (optional)**

*If you choose to use the vinegar (as a mold inhibitor) add it to the water.*

*Pour 2 bags of sugar into a very large container and gradually add about half the water, stirring to wet the sugar well. Continue adding sugar and water alternately until all the sugar is wet enough to trowel into place.*

## ***Candy Board:***

*A frame 2-3" high with 1/4" hardware cloth or a plastic queen excluder on the bottom. This holds the sugar mix. A 5/8" hole in one*

*side allows some ventilation, but keep it clear to the screen when filling the candy board. Put newspaper, waxed paper, or foundation paper under your sugar in the candy board, and fill with wet sugar. If you are going to use a pollen patty, fill the board half-way, insert a wooden block as a placeholder, and when ready to use the candy board add the patty in the center.*

*Don't add it early as it may mold. Screen the sugar off level with the top of the board. Allow to harden overnight.*

*Remove inner cover from hive, and replace with candy board, screen side down. Some use thin lifiting sticks under the candy board to support the sugar. This way, bees do not get crushed when you lift the board to look. Replace outer cover.*

*You can now easily raise the outer cover any time and slip in additional sugar bricks or pollen if you need them. [Click here to see detailed photos and video on making candy boards](#) .*

## ***Pollen Substitute***

*Occasionally there is a shortage of pollen, or perhaps you simply desire to promote the raising of brood. Pollen substitutes can be used in such situations; however, despite its name, pollen substitutes are no real substitute for genuine fresh pollen.*

## ***Dry Pollen Substitute***

*Dry pollen substitute can be placed directly into the hive or used in bird feeders to attract local bees.*

***☐ 3 parts (by weight) Soy Flour (expeller-processed soybean flour)***

***☐ 1 part (by weight) Brewers Yeast***

***☐ 1 part (by weight) Nonfat Dry Milk (Not instant milk)***

*Simply integrate the powders together and use. Occasionally bees may refuse to eat pollen substitute, most often when fresh pollen is available. It is, however, possible to trick bees to take the substitute when necessary by integrating a small amount of Vitamin C into the mixture. Often 1 teaspoon per 5 cups can be added. If a powdered form is not available, it is possible to crush a Vitamin C tablet for integration.*

## ***Pollen Patty***

*To make a pollen patty, bind the Dry Pollen Substitute with enough 2:1 Syrup to make a putty or dough like consistency.*

## ***Grease Patties***

*Grease Patties containing both wintergreen oil or tea tree oil and mineral salt appear to have an effect on varroa mites and tracheal mites . These effects can be seen when brood is present, and has a devastating effect on mites when brood is not present. However, grease patties with essential oils should not be used during times of honey collection for human consumption. During this time, grease patties without essential oils can be used to a lesser effect. For any noticeable effect, a grease patty of some form should be used at all times. Replace any consumed patties.*

## ***Simple Grease Patty***

*☐ 1 part (by volume) solid vegetable shorting (such as Crisco)*

*☐ 2 parts (by volume) white sugar*

*Mix sugar and shortening until well combined. Split into approximately quarter cup (~6 centiliters) portions and store excess in the freezer sandwiched between sheets of wax paper.*



## ***Grease Patty With Mineral Salt***

***☐ 2 lbs solid vegetable shorting (such as Crisco)***

***☐ 3 lbs whites sugar***

***☐ 1 lb 1:2 Syrup or High Fructose Corn Syrup or Clean Honey***

***☐ 1/3 cup pulverized mineral salt (~1/5lb Depending on mineral content)***

***Prepare the same as you would a simple grease patty recipe.***

## ***Grease Patty With Mineral Salt and Essential Oils***

***☐ 2 lbs solid vegetable shorting (such as Crisco)***

***☐ 3 lbs whites sugar***

***☐ 1 lb 1:2 Syrup or High Fructose Corn Syrup or Clean Honey***

***☐ 1/3 cup pulverized mineral salt (~1/5lb Depending on mineral content)***

***☐ 3 table spoons wintergreen oil***

***Prepare the same as you would a simple grease patty recipe.***

## ***Extender Patty***

***If a grease patty contains terramycin, it is called an extender patty, and was once considered one of the best ways to control AFB. As resistance has been noted with this form of application it is no longer recommended. For your information, the recipe is here.***

***lb powdered sugar***

***1b solid vegetable shortening (such as Crisco)***

***2 tablespoons Terramycin TM-25***

***This patty was used to eliminate three weekly dustings of powdered Terramycin. The danger is that keeping a low level of TM in the hive leads to resistance.***

## ***Other***

***The following recipes simply do not fit in to any of the previous categories. This does not mean that they are any less useful.***

## ***General Purpose Essential Oil Mixture***

***This is similar to Honey-B-Healthy***

***A commercial, general purpose essential oil product for bees that is similar to the following recipe claims many benefits, but many of those claims have yet to be proven. The following recipe may work about as well as that product. It has been known to occasionally cause Robbing behavior due to its great appeal to bees.***

***☞ 5 cups water***

***☞ 2 1/2 pounds of sugar***

***☞ 1/8 teaspoon lecithin granules (used as an emulsifier)***

***☞ 15 drops spearmint oil***

***☞ 15 drops lemongrass oil***

***Bring the water to a boil and integrate the sugar until dissolved. Once the sugar is dissolved remove the mixture from the heat and quickly add the lecithin and the essential oils. Stir until everything is evenly***

*distributed. This solution should have a strong scent and not be left open around bees. Cool before using.*

## **Smokeless Smoke**

*A solution of general purpose essential oil mixture and 1:1 syrup can be mixed and used in a standard spray or misting bottle. This solution reportedly has varied effects depending on the specific history of the hive. Because of differences between each hive it, is best to try a ten to one [1:10?] mixture of essential oil mixture to syrup and vary the ratio as necessary. Have your smoker readily available during your first few trials in case the bees don't react to the solution.*

## **Essential Oil Scent Masking Syrup**

*Nearly any essential oil can be mixed with a 1:1 syrup solution to mask an undesired scent in the hive. Among other uses, a masking syrup can be used during queen introduction or when joining two hives.*

*Simply add the desired amount of oils to the syrup. The stronger the scent, the better it will serve to mask other scents, though be frugal as essential oils have a strong smell.*

*One of the more common oils to use is peppermint oil, but be sure not to use banana oil .*

## **Scent Masking Syrup**

*An inexpensive scent masking syrup can be used similarly as the recipe for essential oil scent masking syrup. Simply prepare a 1:1 syrup and one or two crushed peppermint candies for every two cups of prepared solution. Load the solution into a spray bottle and use as needed*