

Beekeeping and hive products

Elize Lundall-Magnuson

21 January 2023



Importance of insects in agriculture

- Beneficial insects
 - Insects protecting our food crops
 - Insects keeping the environment clean
 - Producing byproducts as animal and human food
 - Insects pollinating our crops
 - Producing byproducts used as food, as medicine and in art
 - Providing pollination services

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- Beneficial insects
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 - Other pollinators (insects and other animals)
 - Honeybees as livestock!
 - Producing byproducts
 - » Use the byproducts in food
 - » Use the byproducts in confectionary
 - » Use the byproducts in medicine
 - » Use the byproducts in home remedies
 - » Use the byproducts in the cosmetics industry
 - » Use the byproducts in art
 - Providing a pollination service

Role of pollinators

- They can be bees, birds, mice, bats,
- Honeybees



Pollen on the nose
of the mouse!



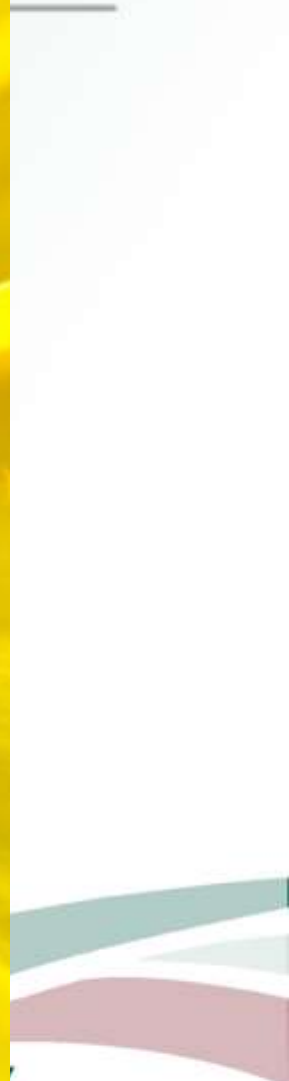
Butterfly pollinating a flower





A weevil providing pollination

Insect as pollinator. Pollen grains stick to the hairy body



Two pollinators at the same time. Both collecting nectar from the flower and in return provide a pollination service



A butterfly and a bird are collecting nectar and in turn provide pollination





Bumble bee on
tomato flowers busy
with pollination

The bee is not
indigenous in SA
and the Department
of Agriculture will
allow it to come into
the country
because it is a
strong bee that can
take over and
dominate all other
indigenous bees in
SA



This moth is using its proboscis to collecting nectar deep in the flower. Bees cannot collect from plants like this

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Question to answer why is honeybees essential and important in pollination???



Why is honeybees important as pollinators

- They might not be the best pollinators
- They might not do a good job at pollinating things like jacaranda and Lucerne BUT.....
- They can be manipulated by us and we can use them

A few facts why bees as pollinators are essential to our survival

Agriculture depend on honeybees for pollination

Almost three quarters of the world's crop species depend, at least in part, on bees and other pollinators

POLLINATION AND ZERO HUNGER

What do bees have to do with achieving Zero Hunger, one of the 17 Sustainable Development Goals? Quite a lot, actually. Close to three-quarters of the world's crop species depend, at least in part, on bees and other pollinators, conforming to the major characteristics of the 2030 Agenda for Sustainable Development, nourishing people and nurturing the planet. Pollinators play an essential role in helping to feed a rising world population in a sustainable way [SDG 2] and help maintain biodiversity and a vibrant ecosystem [SDG 15]. They contribute to building resilient livelihoods and creating new jobs, for poor smallholder farmers in particular, satisfying the growing demand for healthy, nutritious food as well as non-food products [SDGs 1 and 9].

The worrying decline in the number of pollinators, largely brought about by intensive agricultural practices, changes in land use, use of pesticides and by more extreme weather events, is related to pest and disease outbreaks, and higher levels of malnutrition and non-communicable diseases, provoking health issues for populations around the world [SDGs 3 and 13].

Already the highest agricultural contributor to yields worldwide, pollination, with improved management, has the potential to increase yield by a quarter [SDG 8]. No wonder there is so much buzz about bees!

FAO document



*World Bee Day presents
an opportunity to recognize the role
of beekeeping, bees and other pollinators
in increasing food security, improving nutrition
and fighting hunger as well as
in providing key ecosystem services
for agriculture*

José Graziano da Silva
FAO Director-General



World Bee Day
proclaimed
by the UN
in 2018

Aim is to
protect the
bees and
to create
awareness
among all
nations



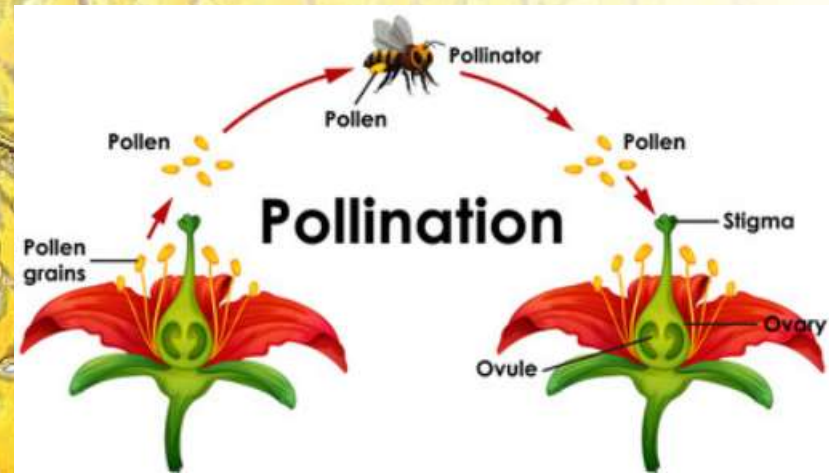
Pollination facts

Honeybees provide 80% of all insect pollination.



Pollination facts

It is estimated that cross-pollination from bees helps 30% of the world's food crops and 90% of wild plants to grow



Pollination facts

Bees also pollinate 70 of the top 100 food crops humans eat

- Berries like blue berries, strawberries, raspberries
- Apples, plums, pears, litchi, ,mango, oranges etc.
- Avocado
- Pumpkin, cucumber, squash
- Tropical fruit like guava, litchi, mango
- Almonds, macadamia nuts, pecan nuts
 - Macadamia is the biggest growing industry in SA that need 100% pollination
- Peas and beans
- Oil Seed producers like sunflower and canola

Pollination facts

A single large and strong
bee colony can pollinate
300 million flowers per day




Pollination facts



At least a third of the food in our diets relies to some extent on bee pollination.

Bees also pollinate crops planted for animal feed like lucerne

Pollination facts



Researchers estimated that pollination services from managed beehives to agricultural crops were worth R1,82 billion annually for SA.

This amount exclude free pollination from bees in the wild.

Pollination facts

Using bees to pollinate food crops increases the yield and quality of an estimated 35% of crop production worldwide



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How is honeybees livestock?

- We can keep honeybees in beehives
- One farmer can keep up to 15 000 beehives in SA. In the USA one farmer might keep up to 200 000 swarms of bees in large operations
- Do not need land, we can migrate with bees
- Only need sites where the bees can stand safely. The site can be permanent or just for a short period of time



Here is a
beekeeper
working in
his bee
hives and
inspecting
the crop

This is a small apiary site close to a homestead. This type of site is called a permanent or sedentary site



This is a bigger apiary site in an clearing somewhere on a farm. There is a lot of food for the bees in this area and the beekeeper can keep up to 100 beehives in the area.



This is not a scene we have ever seen in SA. This is a trailer with beehives that are parked in an area and the bees work in the area. The farmer can go into this trailer and open the hives from the inside. It is easy to take from one place to the next and is safe for the bees.



This is how beehives are transported in commercial operations in the USA where beekeepers provide pollination services for almond producers

**There are Approx. 2.7 Million
Honey-Producing Hives in the US...**



Commercial
apiary

How is a bee a pollinator?



How is a bee a pollinator? – pollen stick to the hair of the body



The entire body is full of pollen and the pollen is packet in the pollen basket and taken to the hive





Bees on different flowers collect different pollen



Pollen – bee bread stored in the hive. Variation of plants, colours and protein content





Oriental Poppy	Vipers Bugloss	Rosebay Willow Herb	False Acacia	Elm	Broadbean	
Red Horse Chestnut	Gooseberry	Winter Heath	Berberis	Pear / Crab Apple	Blackberry	
White Horse Chestnut	Red / White Clover	Field Bean	Marjoram	Holly / Mountain Ash	Clematis (wild)	Raspberry
Lupin	Sycamore or Ash	Lauristus	Meadowsweet	Hawthorn or Oak	Bell Heath	
Red Deadnettle	Blackthorn	Ling Heather	Wallflower	Beauty Nightshade or Wild Honeysuckle	Field Thistle	Hazel or Elder
Gorse	Yew	Flowering Currant	Onion	Hairy Willowherb	Balsam	
Copper Beech or Broom	Plum or Wild Cherry	Apple or Cabbage	Knapweed or Borage	Sweet Chestnut	Common Beech or Litch	
Field Scabious	Yellow Crocus	Ivy	Wild Bluebell or Plantain	Elder or Plantain	Privet	
Rockrose	Dandelion	Willow	Laurel	Wild Honeysuckle	Evening Primrose	
Asparagus	Common Lime	Blue Crocus	Broccoli	Dogwood	Oil Seed Rape	
Snowdrop	Buttercup or Mustard	Poplar	Bos	Californian Poppy	Hogweed	

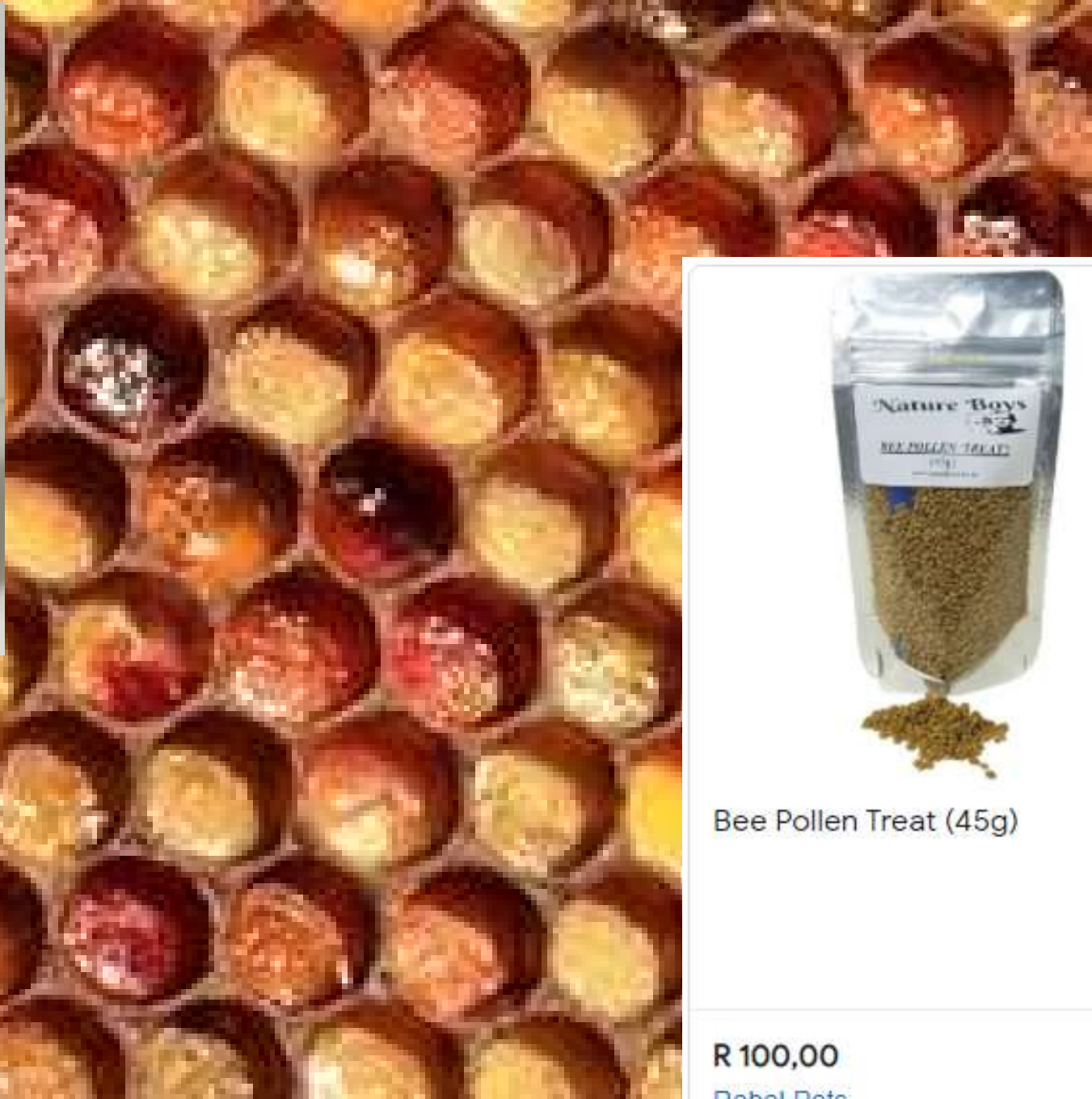




Pollen from a daisy as seen under an electron microscope



The bees collect the pollen and pack it into the cells. Here it is clear they pack what they find and not one type per cell



Bee Pollen Treat (45g)

R 100,00

Rebel Pets

R 77,00 delivery

Pollen is then collected and sold in this form or mixed with honey

Keeping of bees

- Beekeeper places hives out for pollination in canola fields





The honeybees
take the pollen to
the hive

They work in sunflower fields, pollinate, collect pollen and nectar and make honey





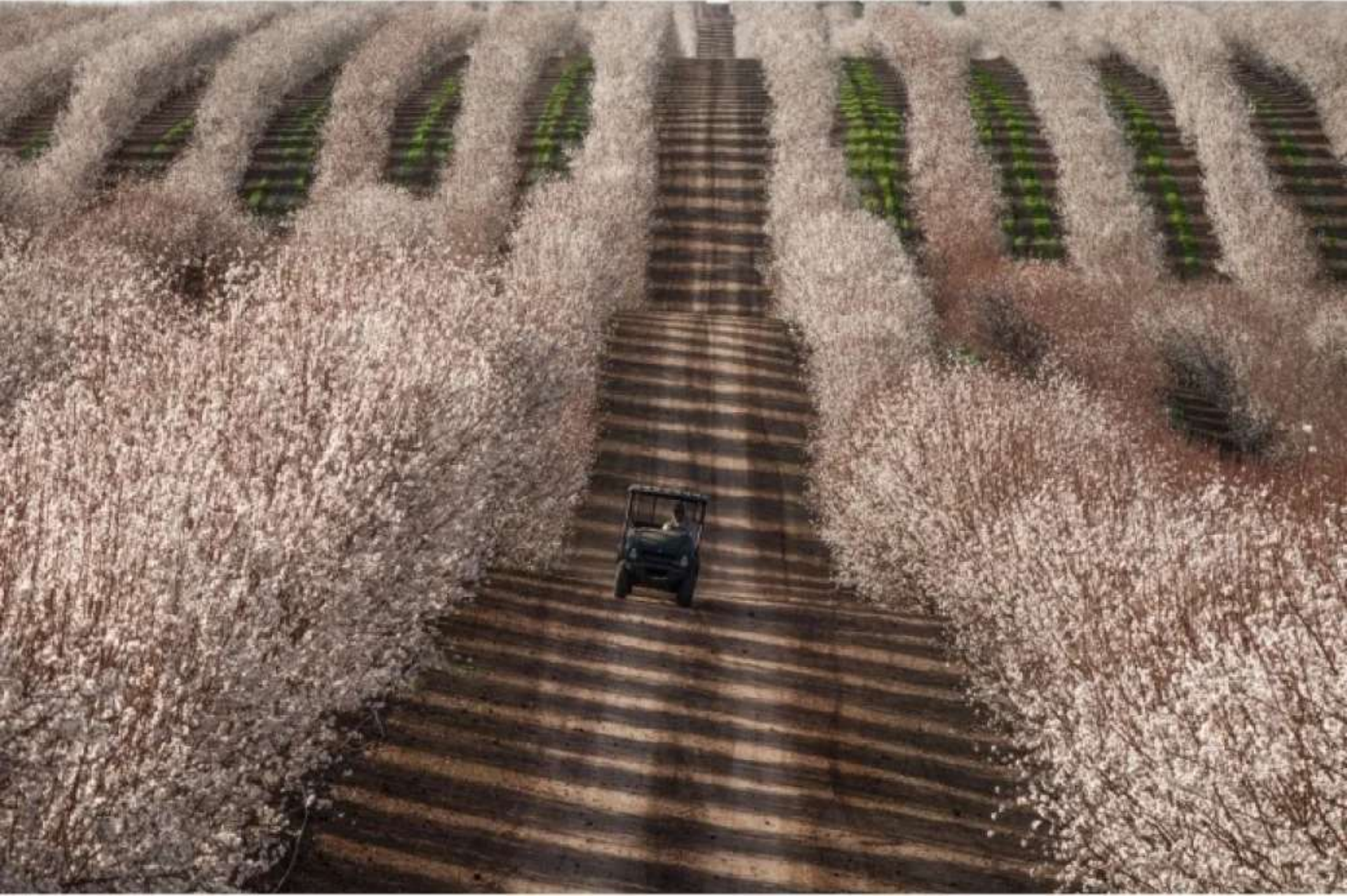
Honey produced from sunflower and canola (known as rapeseed in other parts of the world)

Example of the need for pollination



Pollination of almonds in US needs 1,7 million bee hives

Here is an example of why pollination is essential
An almond farm in California



Beehives in an almond orchard



Pollination of macadamia -
150 insects must visit a
raceme (string of flowers)
for effective pollination





One large macadamia tree can have 2-3 million flowers and the farmer can harvest 35kg nuts (SAMAC) per tree IF pollination was effective (hardly ever happens)

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What hive products do we get?

- Collect pollen, nectar, propolis and water
- Why do they collect the above?
 - Nectar
 - Make honey – feed larvae and themselves
 - Pollen
 - Bee bread – feed larvae and themselves
 - Propolis glue
 - Chew it to close off & the sterilize the hive
 - Water
 - Use in the hive to control the temperature in the hive in summer

Bees can collect...

Propolis



Pollen



Nectar converted to honey

Bee collecting nectar



Bees collecting **water**



Bees collecting resin



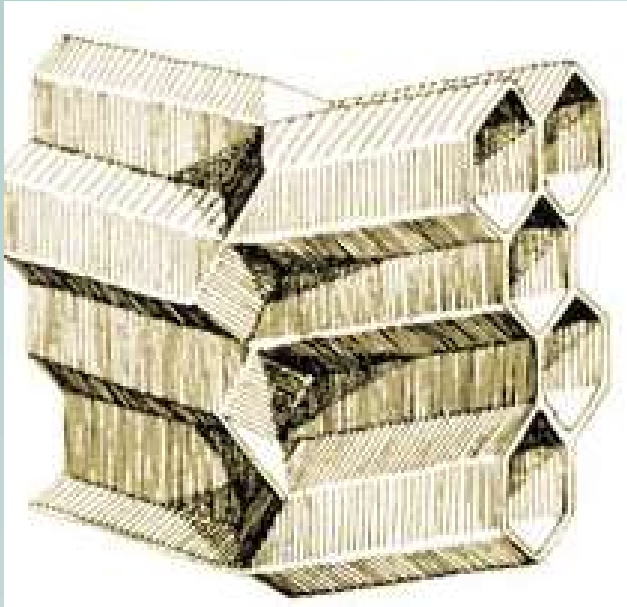
What are bees producing

- Make the following
 - Bees wax
 - Venom
 - Royal jelly

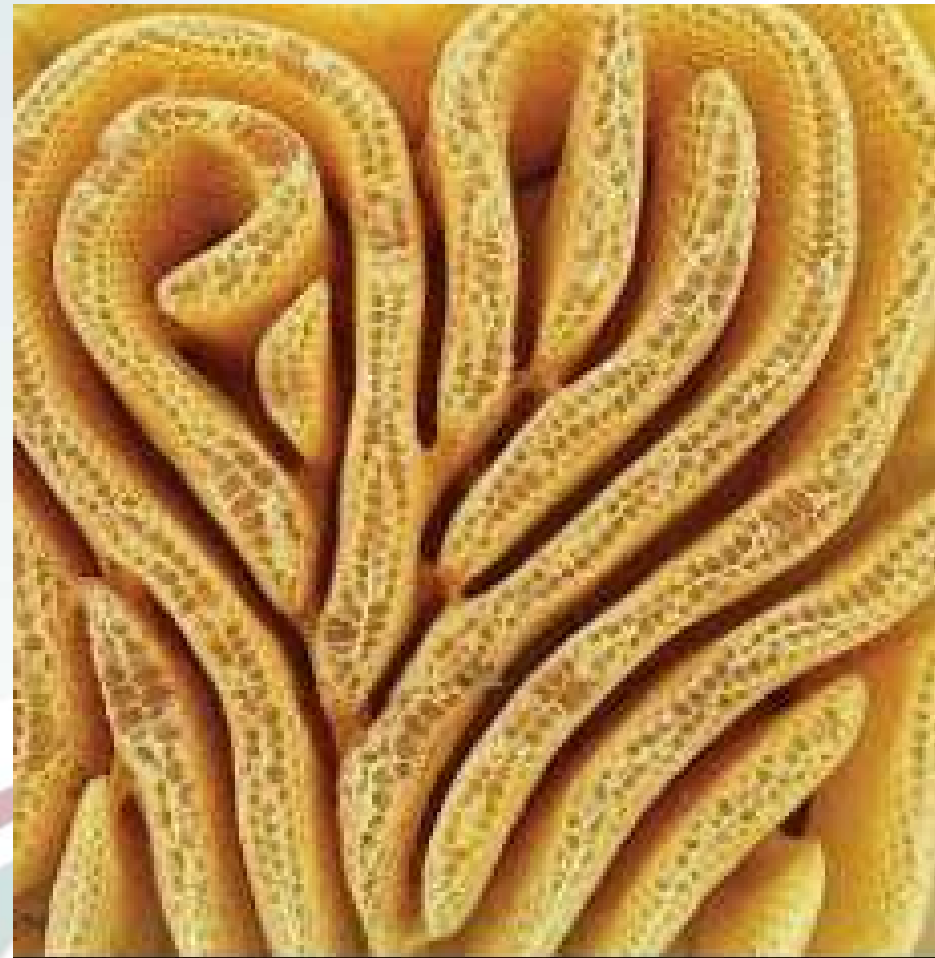
One bee is producing the **wax** scale, the next one take the scale, chew it and hand over to the builders



Perfect hexagon - beeswax



Hexagon lying at an angle on both sides so that the nectar, water or honey cannot run out



Venom



Royal jelly



Use a small glass
pipette to suck
the **Royal jelly** out

Royal jelly



Expensive product – Royal jelly



Forever Royal Jelly
60 Tablets | Fast &...
ZAR 571.33
Shop Forever Prod...



Manuka Honey
Cream with Royal...
ZAR 269.35
Piping Rock Health...
★★★★★ (81)



Simply Bee Propolis
Serum 20ml,...
ZAR 239.95
Wellness Warehou...



Royal Jelly

R 2 019,00 [Pc Link Shop](#)

royal jelly



Fresh Royal Jelly - All Pure Premium Quality 16oz

R 6 026,00 [Pc Link Shop](#)

100% Pure, Recent Fresh- Quality And Natural || No Artificial Colors, Flavors Pure Frozen || Naturally Wealthy In B-vitamins ...



Stakich FRESH ROYAL JELLY - 100% Pure, All Natural, Highest Quality - No Additives/Flavors/Preservatives Added - 1 KG (2.2 LB)

R 5 386,00 [Pc Link Shop](#)

100% PURE, FRESH - All Natural and Premium Quality || NO ARTIFICIAL COLORS, FLAVORS, PRESERVATIVES, OR ADDITIVES - Naturally ...

1,000 grams - Gluten-free

Where do they get the honey?



They collect nectar



They collect nectar



Lavender
flower

They collect nectar



Nectar
down in
the flower

Deep in Eucalyptus flower





Collect pollen

Collect nectar





Mouth parts is pushed together and become a straw that is used to such up water and nectar

Dehydrate the nectar

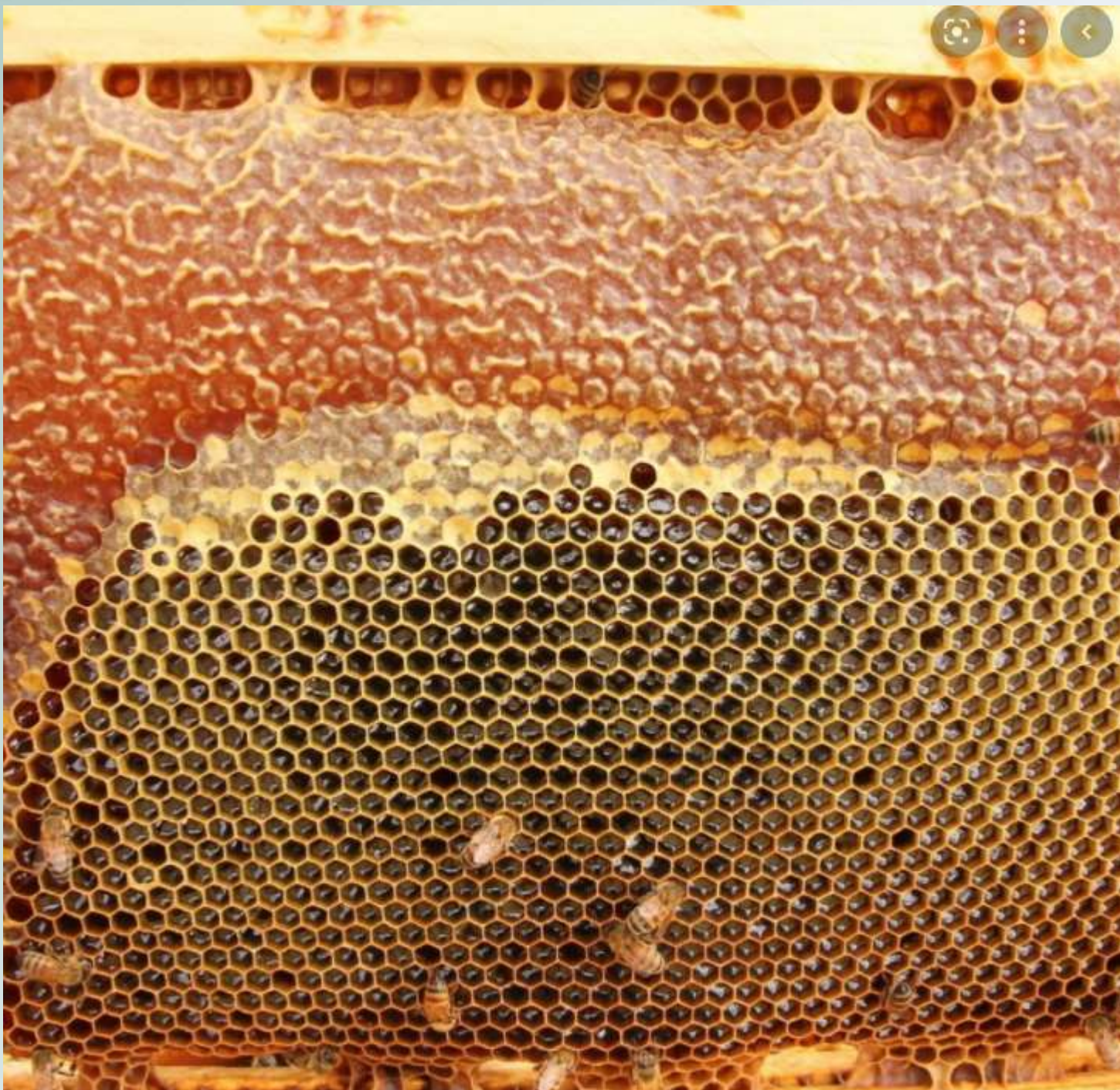


Dehydrate the nectar



Cap the cell after dehydration





The bees are still dehydrating the nectar at the bottom. Cannot extract this. If you do...

Fermented honey



This honey was not ripe and now it is fermenting

Capped cell



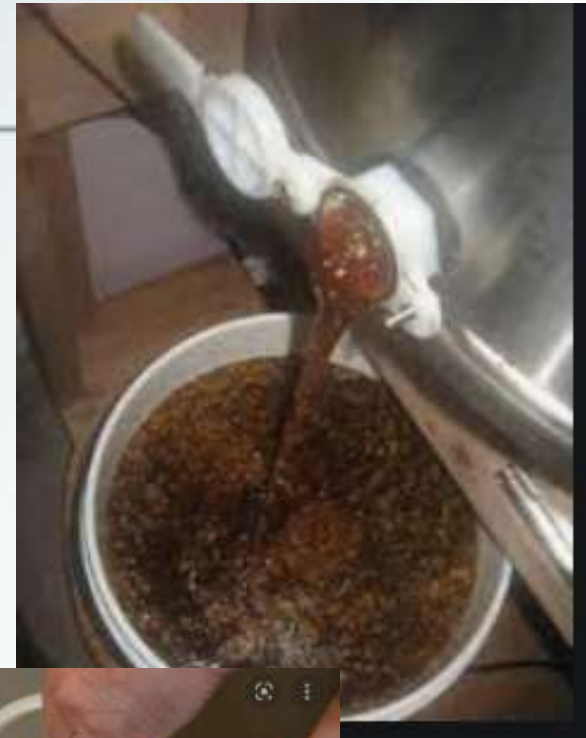
Most of the cells are capped and the honey is ready

Uncapping



The uncapping fork is used to uncap the comb and open the cells so that the honey can be extracted

Extracting honey



Clearing the wax from the honey



Final product on the right



Honey and marketing?



On the shelves



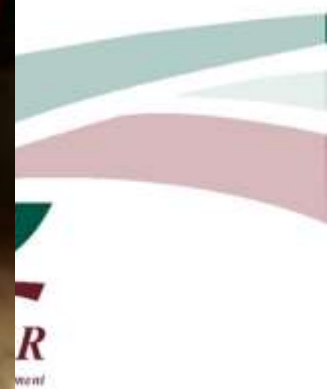
Local and imported honey



Packaging – read the label



Read the label



Queen bee honey



Queen Bee Honey

It is a honey syrup
and the bottle say
so



Read the label





Types of honey in SA

R110



R95



R99 sunflower





R295



R250 fynbos



R77 checkers



RAW COMB HONEY

COMB HONEY IN BOTTLE –
BLUEGUM

R200.00



RAW VARIETY HONEY

ACACIA HONEY 340G

R80.00



RAW VARIETY HONEY

HAPPY HONEY PACK 800G

R180.00



RAW VARIETY HONEY

MULTI FLORA HONEY 340G

R65.00



Raw Honey, Acacia, 1kg (B'Licious)

R200.00

B'Licious Acacia Honey is 100% pure, natural, local, raw honey. Not irradiated or processed ensuring that all its natural enzymes, vitamins and antioxidant content is intact. Free of any additives. No preservatives.

[♥ Add to wishlist](#)

Only 1 left in stock

[Add to cart](#)

Various types of honey

Liquid honey and comb honey in one bottle. This is a chunk of honey in liquid honey



Beautiful packaging



Beautiful packaging



Variations of honey – why?



Specialised labels



Honey on our shelves



	Honey	Price / Kg
11	Toca Raw organic Chestnut Honey	\$77.6
10	Greek traditional Golden Thyme Honey from Crete	\$110
9	Lo Mejor del Bierzo	\$178.13
8	Domestic Acacia Honey	\$195
7	Endemic Rize Anzer Ovit Flower Honey	\$258
6	Authentic Yemen Sidr Honey	\$282.9
5	Taulang Black Honey with comb	\$500.19
4	Sour Honey	\$1465
3	Herbesan Manuka Honey	\$2272
2	Turkish - Elvish honey	\$6800
1	Turkish – Centauri honey	\$13600

11

Toca Raw Organic Chestnut Honey

Price: \$77.6 per kilo



10

Greek Traditional Golden Thyme Honey from Crete

Price: \$110 per kilo



Lo Mejor del Bierzo

Price: \$178.13 per kilo

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Domestic Acacia Honey Bottle

Price: \$ 195 per kilo

8



Endemic Rize Anzer Ovit Flower Honey

Price: \$258 per kilo

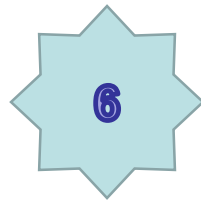


Turkish Anzer Honey is another most expensive honey along with its creative power in the world. It is produced in Anzer Plateau Rize in the Eastern Black Sea region of Turkey. Anzer honey is produced from Endemic and herbaceous plants that are special to Anzer Plateau.

FIVE

Authentic Yemen Sidr Honey

Price: \$282.9per kilo



Tualang Black Honey with the comb

Price: \$500.19 per kilo



Another rare and expensive honey that deserves to get on the list of costliest honey is the Tualang Black Honey with the comb. This precious honey is produced by a special big honey bee 'Apis Dorsata'.

Tualang Honey is merely available in Southeast Asia equatorial region. It is generally harvested from the Tropical Rainforest Heritage of Sumatra. The worth of this honey is about \$500.19. Generally, it is available in a jar of 26oz which is worth \$368. The reason for the high price is the least harvesting of Tualang tree.

Sour Honey

Price: \$1465 per Kilo

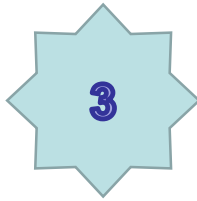


It is believed that sour honey is one of the rarest and costliest kinds of honey in the world. Sour Honey is natural sweet honey that is native to North-East India. It is imported directly from the Brazilian rain forest and produced by one kind of stingless bees. It has a premium price of around \$1465 per kilogram. The price of this honey is surprisingly high as the production of it is comparatively less, unlike regular honey.

Generally, it is found in the grocery stores in a jar of 12 ounces which is cost \$498.50. It can be used as a skincare ingredient because it helps prevent acne and impart glow to the skin. Sour honey shouldn't be given to children under the age of 1.

Herbesan Manuka Honey IAA 18+

Price: \$2272 per kilo





Watson & Son 1 kg 600 Plus Manuka Honey

R 6 480,00 [Karibaa](#)

Product description Product Description Unlike other types of ho
Manuka - 1,000 grams



Price: \$6800 per kilo



At present, Elvish Honey from Turkey is the most expensive honey in the world which is worth US \$6800 per kilogram. Doesn't it cost more than gold jewelry or the maximum amount of a small car? The beekeepers who sell it named this honey "the true nectar of the Gods".

This thick and golden-colored honey is extracted from a cave in the Saricayir valley of Artvin city which is 1800 meters deep situated in northeastern Turkey. A Turkish beekeeper, Gunduz Gunay discovered this cave in 2009. He mentioned that Elvish Honey is 100% naturally produced, and the cave is rich in mineral content which increases the honey's quality as well as value.

Besides this area is crammed with medicinal plants which also increases the value of this honey. This lavish honey is often utilized in both medicine and food. Generally, it is available in a jar of 170gm and 250gm.



Elvish Honey produced in Turkey costs € 5.000 for one kilo. It is ...

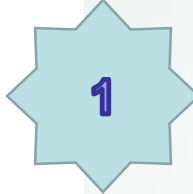
Elvish honey from Turkey
€5000 per kg



Honey is made by bees living in a cave.
Beekeepers have to go 1800 m into a cave to collect the honey
€5000/kg
R93 100 / kg



This heavenly ambrosia carried a hefty price tag of £8,700/kg (€10,000/kg).



On 16th February 2021, *Centauri Honey* (Turkey) broke the world record for most expensive honey.

€10 000 / kg
€ 1 is R18,62
R186 200/kg



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Lemon Honey Preserve

Honey as a preservative







HONEY FRUIT ROLL
PEACH & PEAR



SUNDRIED & SWEETENED WITH PURE HONEY

HONEY FRUIT ROLL
GUAVA



SUNDRIED & SWEETENED WITH PURE HONEY

HONEY FRUIT ROLL
PEACH & APRICOT



SUNDRIED & SWEETENED WITH PURE HONEY

INGREDIENTS:
PEACHES, APRICOTS, HONEY
PRESERVATIVE (SULPHUR DIOXIDE)

© 2014 THE HONEY STALL

THE HONEY STALL, 22 MOUNTFIELD STK,
MIDLANDS, TEL: 01543 411111

STORE IN A
COLD DRY
PLACE



Excellence in Research and Development





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TORRONE

*Almond Honey
Nougat Candy*

*All Natural
Low Fat
Less than 45 calories
per piece*



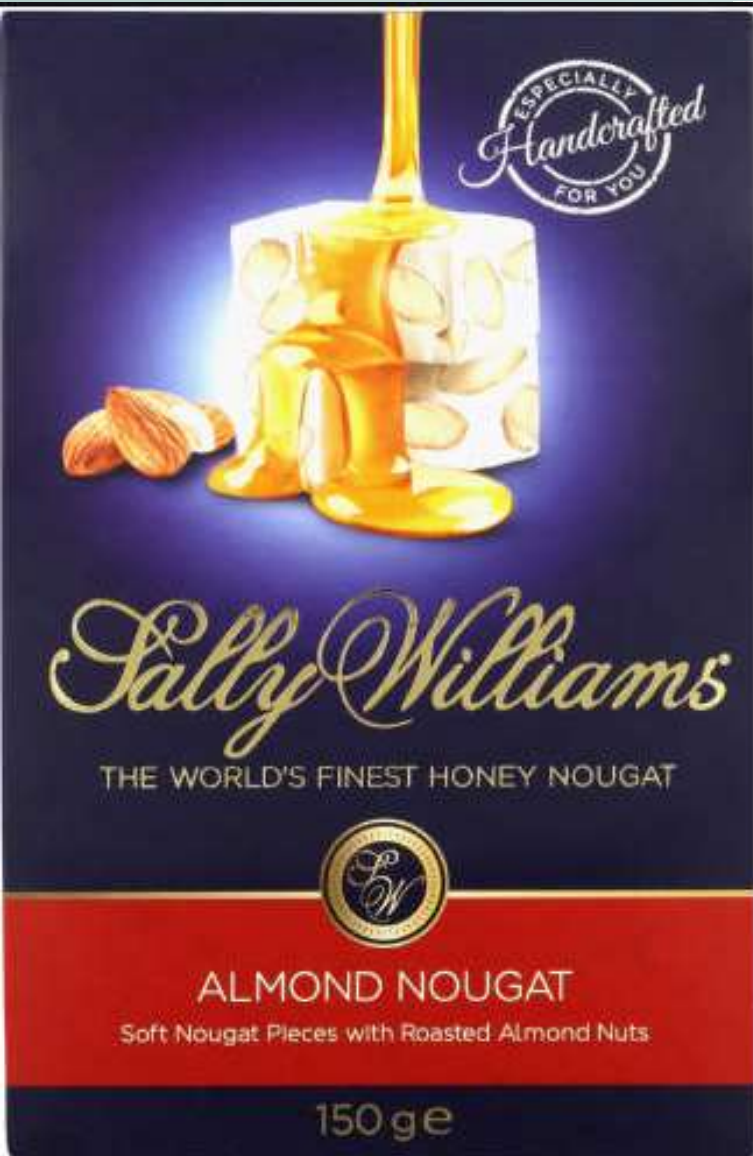
Photo enlarged
to show texture.

*18 Assorted Pieces
Vanilla, Orange & Lemon Flavors
Product of Italy*

NET WT 7.62 OZ. (216g)







ALMOND

Nutrition Facts

About 5 servings per container

Serving size **2 pieces (30g)**

Amount Per Serving

Calories 130

% Daily Value*

Total Fat 4g **5%**

Saturated Fat 0g **1%**

Trans Fat 0g

Cholesterol 0mg **0%**

Sodium 30mg **1%**

Total Carbohydrate 22g **8%**

Dietary Fiber 1g **3%**

Total Sugars 17g

Includes 17g Added Sugars **34%**

Protein 2g

Vitamin D 0mcg **0%**

Calcium 21mg **2%**

Iron 0mg **2%**

Potassium 59mg **0%**

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

INGREDIENTS: Corn Syrup, Sugar, Almonds (24%), Egg White, Honey (5%), Wafer Paper [Potato Starch and Vegetable Oil (Olive Fruit)], Natural Flavoring, Corn Starch

Contains: Egg, Almonds, Sulfur Dioxide (Sulfites)

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Sally Williams Fine Foods USA LLC
1234 NE 4th Ave Suite B
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Florida 33304
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PRODUCT OF SOUTH AFRICA

Manufactured By:

Sally Williams Fine Foods (Pty) Ltd
46 Galaxy Avenue
Linbro Business Park
Frankenwald 2090
Gauteng, South Africa

Real honey is used for this nougat and they use 2 ton of honey per month and prefer to buy SA honey





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Honey in medicine

- Commercial industry
- Honey mixed with betadine for burn wounds
- Home remedies
 - Honey for wounds like cuts that are small and do not need stitches
 - General flu medicine (hot toddy)
 - Mixture of honey, propolis, ginger, brandy and hot water



Veterinary surgeon


Honey used in wound dressing

Father (diabetic) had heart surgery and the wound on the leg was smelling and getting septic.

She treated the wound daily with a light honey wound dressing and this is the result

Materials





A dog bit the vet and she pulled her hand. The skin of the hand was torn completely and was degloved (torn off) to the fingers. They treated the hand with a honey dressing every day and this is the hand still swollen but the skin attached again

Cannot show the degloving
– too gruesome







Honey in cough medicine

- Recipe

- One tablespoon of honey
- One teaspoon of ginger
- Half a cup of boiling water
- Lemon juice to taste
- Mix all ingredients
- Add small amount of brandy (tot) to the mix
- Drink warm

- You will sweat and feel better the next day

Honey for burn wounds

- Mix honey with betadine and put on burn wound. The dressing will not stick to the wound when it is removed and slowly the wound will heal
- Small wound from a kitchen knife
 - Put honey on the wound and close the wound
 - Do this every day and the wound will heal

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Bee Art is popular



I NEVER DREAMED I'D
BECOME A SUPER COOL
Beekeeper
BUT HERE I AM
KILLING IT!

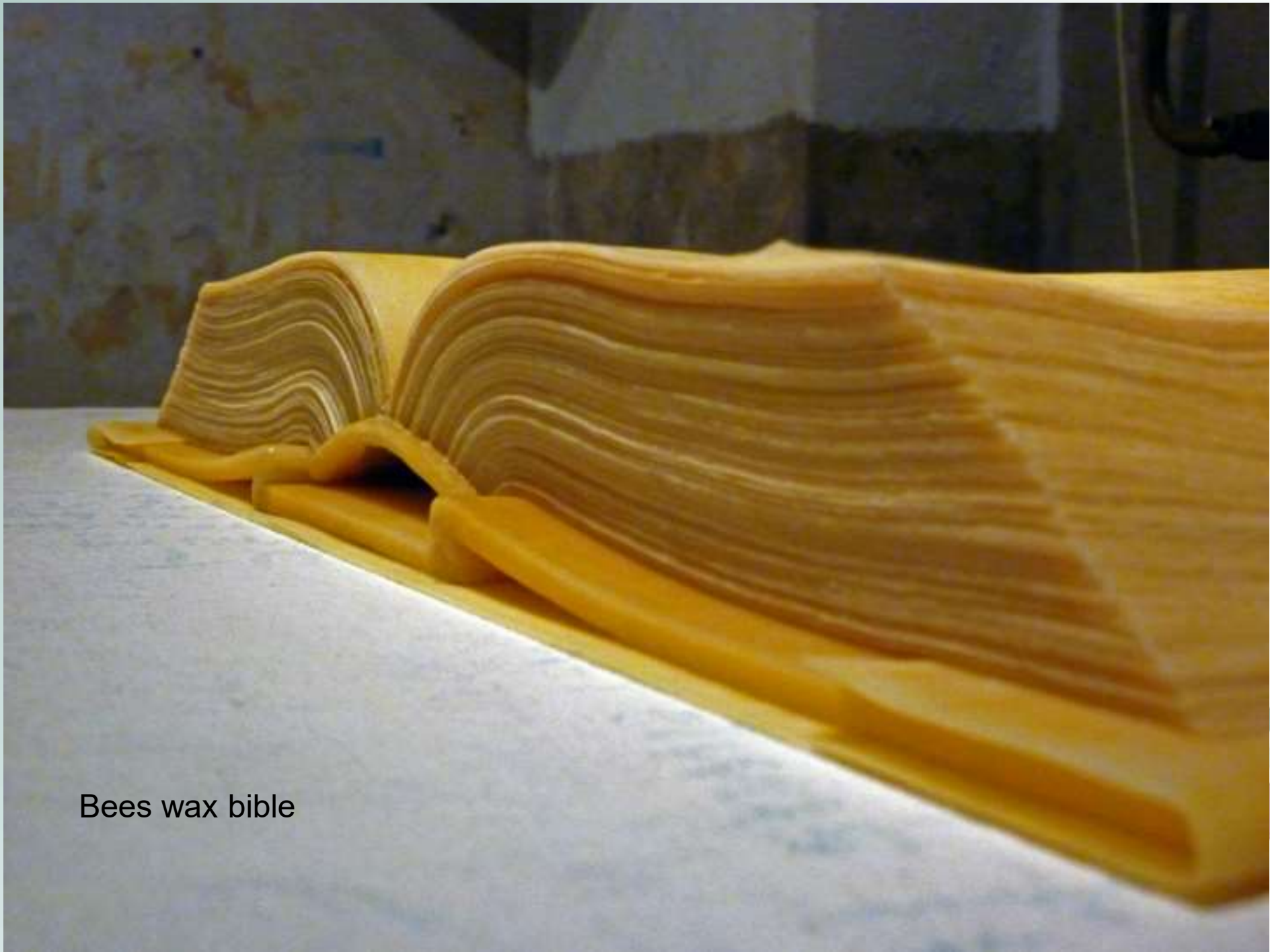


Batik using beeswax to close areas when they are going to use another colour









Bees wax bible



Artists are working on the face of the statue of Renaldo in one of the wax museums of the world. Paraffin and beeswax are mixed together for a pliable and strong end products





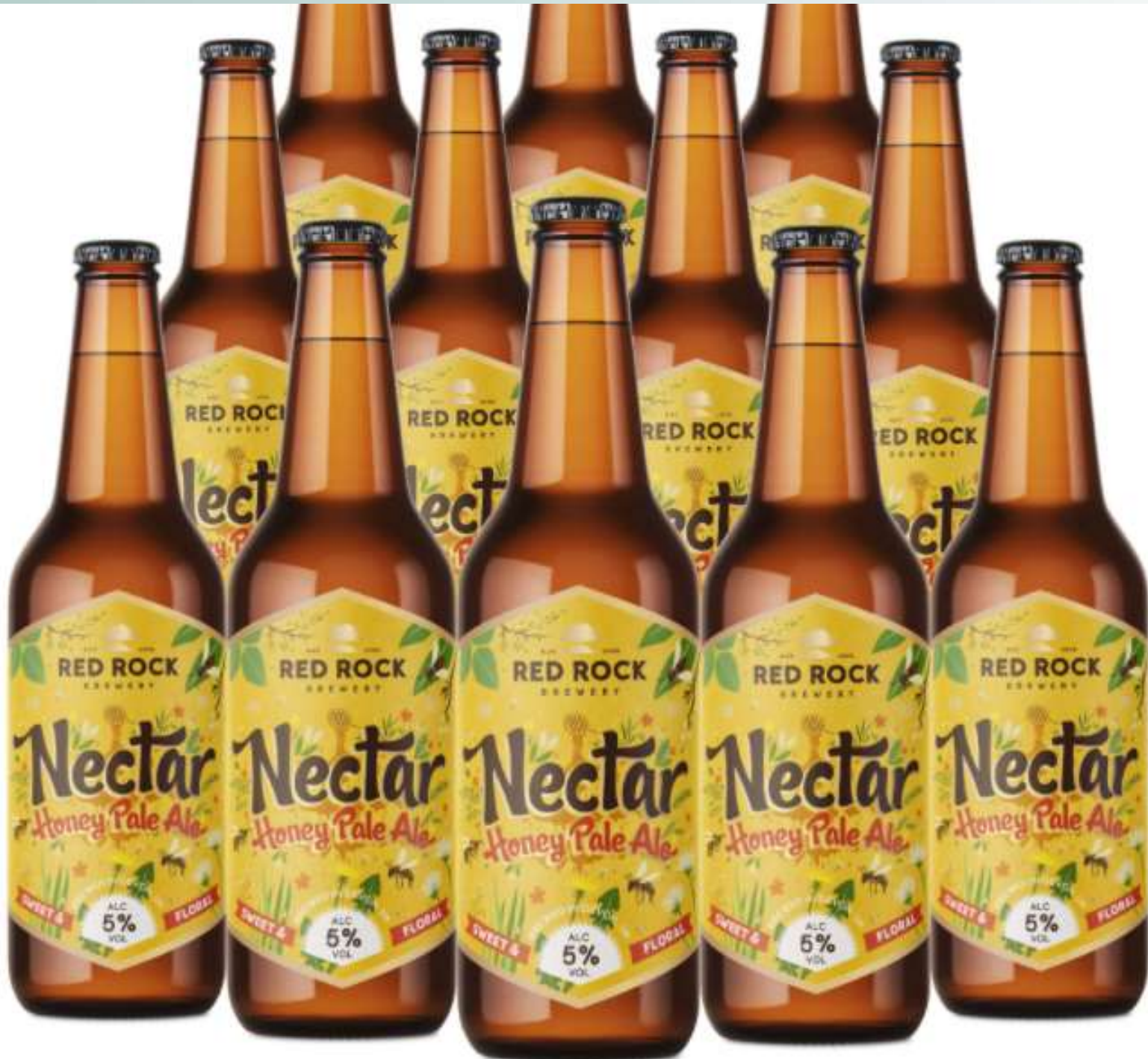
Wax (beeswax mix) statues of Pres Mandela, the Dali Lama, Martin Luther King

Importance of insects in agriculture

- Beneficial insects
 - Insects pollinating our crops
 - Other pollinators (insects and other animals)
 - Honeybees as livestock!
 - Producing byproducts
 - » Use the byproducts in food
 - » Use the byproducts in confectionary
 - » Use the byproducts in medicine
 - » Use the byproducts in home remedies
 - » Use the byproducts in the cosmetics industry
 - » Use the byproducts in art
 - » Use honey to make products
 - Providing a pollination service









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 - » Use the byproducts in art
 - » Use honey to make products
 - » Beekeeping related products / activities





Wedding / party favours

Weddings,
bachelorette parties,
gender reveal
parties AND AND
AND







*Honeybees work for us every minute of the day.
They are not charging us*