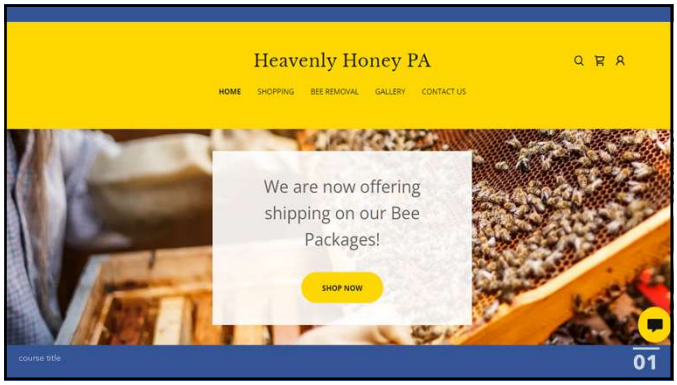
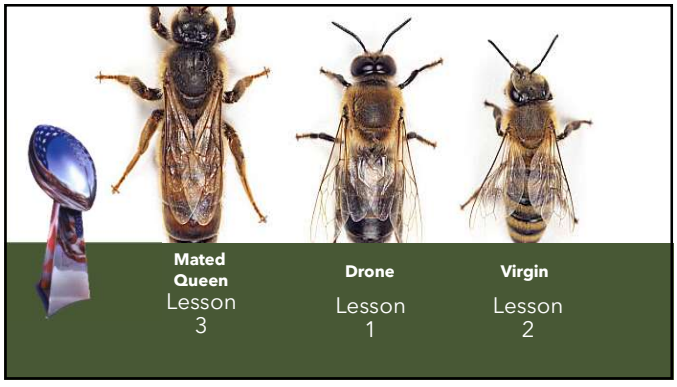
This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number ONE24-432.



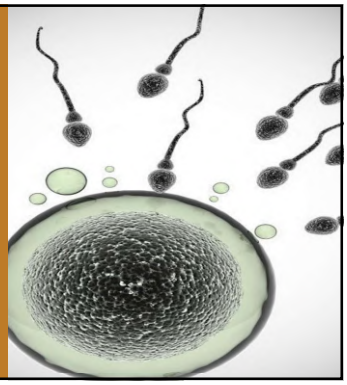
A deeper understanding of:
Drones, Virgins, and Instrumental Insemination (I.I.)
By Robert House

CREATING A BETTER COLONY THRU GENETICS & SCIENCE



Drones
01

What do you know about them?



Q 1: How many days from egg to hatch?

lesson outline - Drones

Q 2: How long do they live?

Q 3: What part do they play in the colony?

Q 4: When do they become sexually mature?

Q 5: What can effect a drone's development?

course title

05

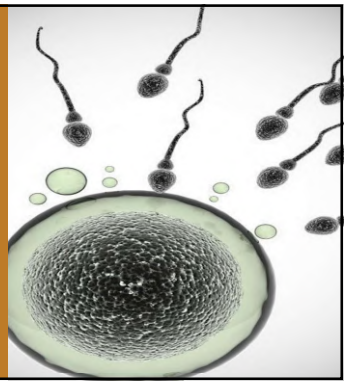
Parents?	Life Cycle	Colony Factors	Environmental	Chemical
• Mated Queen • Drone Layer	• Timing of egg • Egg to hatch • Orientation • DCA • Mating / Death	• Parasites • Colony Size • Genetics • Nutrition • Temperature	• Nutrition • Chemical • Stressors • Wax • Time of year	• Miticides • Fungicides

course title

06

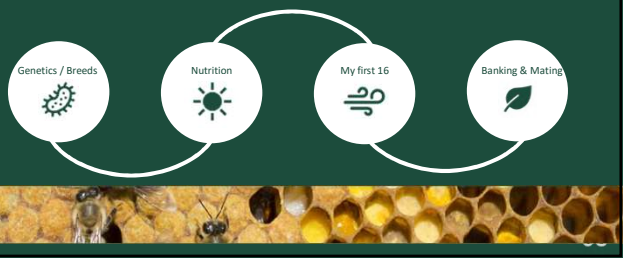
Virgin Queens 02

What do you know about them?



topic 2

Virgin Queens



lesson outline - Queens

Q 1: How many days from egg to hatch?

Q 2: How long do they live?

Q 3: What part do they play in the colony?

Q 4: When do they become sexually mature?

Q 5: What can effect a queen's development?

course title

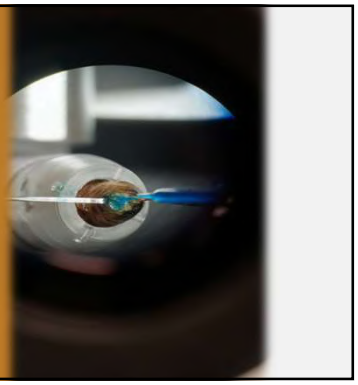


Parents?	Life Cycle	Colony Factors	Environmental	Chemical
• Mother • Father ?	• Timing of egg • Egg to hatch • Mating / Banking	• Parasites • Colony Size • Genetics • Nutrition • Temperature	• Nutrition • Chemical • Stressors • Wax • Time of year	• Miticides • Fungicides

I.I. Queens

03

What do you know about them?



believed that honey bee queens maintain only living sperm in their spermatheca (Woyke and Ruttner 1958; Ruttner and Koeniger 1971), more recent findings suggest dead spermatozoa are not entirely excluded from storage in the spermatheca (Collins 2000; [illegible] 2011). Thus, drones experiencing a reduction in sperm viability or sperm count [illegible] Rhode[illegible] et al. 2013; Shoukry et al. 2013; Rousseau and Giovenazzo 2015; Straub et al. 2016; Kairo et al. 2016, 2017a, b; Fisher and Rangel 2018) may contribute a disproportionately high percentage of unviable sperm cells to a queen's spermathecal stores.

Queen replacement by workers (supersedure) often occurs when brood production falters (Hendriksma et al. 2004; Sandrock et al. 2014), which may happen if she is inseminated with an

course title

topic 3

(I.I) Instrumental Insemination

honey bee (*Apis mellifera*) drones – a review 773

insufficient amount of semen, or with poor quality sperm (Woyke and Ruttner 1976; Cobey 2007). Drones whose reproductive competitiveness is affected by extrinsic factors during development or adulthood may contribute dead or suboptimal sperm to a queen, which can have severe negative consequences not only for the queen herself, but for her colony's overall productivity and survival (Pettis et al. 2016; Kulhanek et al. 2017).

More attention needs to be paid not only to the factors that affect the reproductive quality of queens but also their mates, given that drones confer important contributions to the longevity of queens and the genetic diversity of the colony (Amiri et al. 2017). More research into the sublethal effects of the envi-

More research into the sublethal effects of the envi- [illegible] food by honey bee

"Good queens are not cheap and cheap queens are not good"

"You are paying for labor hours, not a queen"

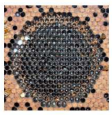
"You buy a Super Bowl"

UBO - Unhealthy Brood Odor

Freeze Kill / Liquid Nitrogen

Liquid nitrogen is applied to a portion of capped brood. Some brood becomes "bald" in the process.

24 hours later, Colony A did not do a great job of removing the freeze-killed brood. Although they uncapped many cells, this colony is not considered very hygienic. Caption: Bee Informed Partnership



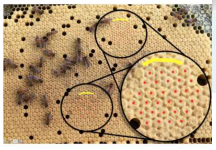
24 hours later, Colony B detected and removed 100% of freeze-killed brood. This colony is highly hygienic. Caption: Bee Informed Partnership

Credit: Bee Informed Partnership

course title

14

Home / Hygiene Tools / 6.3.25 Weimer Needle Pre



Weimer Needle Stamp – Pin Test for Hygiene Pre-Order

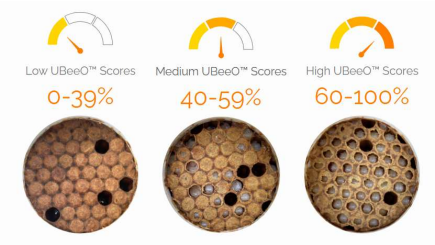
$126.00

***6/10/2025 Once this order has been filled. Next batch will be available for deliver to SBGMI by the end of July. Backorder is permitted, please commit to purchase if you would like these for fall.

This is for pre-order only. Our group order must consist of 25 or more, and then will be completed for shipping from Germany. If half the order is filled, SBGMI will complete the order and anticipate arrival by end of Jun for Summer/Fall testing in the U.S. Price includes shipping in the continental U.S. Once SBGMI receives the product we will begin shipping to individuals – price includes shipping.

15

UBeeO / Kaira Wagoner



16

Reputable *Varroa*-Resistant Bee Breeders in the USA

Company/ Breeder	State	Phone Number	Email	Website
Varroa Sensitive Hygienic				
Harbo Bee Co.	Louisiana	(225) 766-5696	johnharbo@att.net	http://www.harbobeeco.com
VP Queen Bees	South Carolina	(864) 348-3026	info@vpqueenbees.com	http://vpqueenbees.com
Minnesota Hygienic				
Rufer's Apiaries	Texas	(612) 325-1203	N/A	https://www.facebook.com/Rufers-Apiaries-Inc-Deep-East-Texas-Queens-LLC-1612176039035 29/
Mark Sundberg	Minnesota	(218) 731-5942	mdsund2000@yahoo.com	N/A
Jeff Hull	Minnesota	(218) 205-6426	N/A	N/A
Russian				
Dan Conlon	Massachusetts	N/A	warmcolors@verizon.net	N/A
Coy's Honey Farm, Inc	Mississippi	N/A	coyhoney@ymail.com	N/A
Harry Fulton	Mississippi	(662) 738-4611	bigbee.valley.bees@att.net	N/A
Smith Honey Farm	Mississippi	(601) 408-5465	smithhoneyfarm@gmail.com	N/A
Hubert Tubbs	Mississippi	(601) 382-2607	karen_tubbs@att.net	N/A
Manley Bigalk	Iowa	(563) 547-4222	grhoney@powerbank.net	N/A
Steven Coy	Mississippi	(601) 928-5865	steven@coybeecompany.com	N/A
Carl & Virginia Webb	Georgia	N/A	mtnhoneyga@gmail.com	N/A
Bob Brachmann	New York	(716) 699-4145	foobrachmann@hotmail.com	www.ColdCountryQueens.com
Larry Gandy	Mississippi	(601) 577-9111	gandybees@gmail.com	N/A
Chris Hewitt	Virginia	(703) 927-7611	hewitt.christopher@gmail.com	www.richlandbees.com
Dena Hodge	Tennessee	(901) 413-1460	wolfriverhoney@hotmail.com	N/A
Purdue Ankle Biters				
Frank and Zelma Boggess	West Virginia	(304) 372-3106	z_boggess@yahoo.com	N/A
Joe Kovaleski		(740) 632-7500	josephkovaleski@sbcglobal.net	N/A
Dan O'Hanlon	West Virginia	N/A	danno1800@gmail.com	N/A

17

Varroa EasyCheck

Accurately monitor mite counts with the Varroa EasyCheck alcohol wash method.

Item Code: VCHECK

Downloads:
How to Use the Varroa EasyCheck

$21.89

Qty: 1 Add to Cart

course title

18

Significant honeybee colony losses in U.S. caused by virus

By Jody Heemstra

June 5, 2025:

New research from the **USDA's Agricultural Research Service** sheds light on the causes behind the catastrophic honeybee colony losses reported by commercial beekeepers this year. The findings point to an alarmingly high level of viral infections caused by Varroa mites that have resistant genes to a common treatment.

The study analyzed samples from six major commercial beekeeping operations affected by the losses and provided the most detailed evidence of the biological factors behind the widespread die-offs. Collectively, **the operations reported losses averaging over 60 percent of their colonies** just as they were being staged for California's almond pollination season. **All of the Varroa mites** collected **tested positive** for a genetic marker linked to **resistance to Amitraz**, the most commonly used mite treatment in commercial beekeeping.

course title 19

course title 20

course title 21


22


course title
23