The Buyer's Guide to Cornsnake Morphs

2004 Edition

Important Notice:

This book is the result of a lot of hard work. It took a lot of time and resources to research and gather existing knowledge, experiment and discover new knowledge, and finally to organize all of it into a useful format. If you wish to say thanks by leaving me a donation, you can send money via paypal to serpwidgets@hotmail.com, amazon (or other retail) gift card, or bitcoin using the QR code, or email me at serpwidgets@hotmail.com to see what other options might be available.

Thanks, and enjoy!
Charles Pritzel

Thanks to Kathy Love, Kat Hall, and Connie Hurley for their valuable contributions to this project.

2004 cover art, "Flake Mosaic" by Charles Pritzel and Connie Hurley.

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Foreword

As a buyer, it is wise to know as much as possible about what you want to buy. There is more variation and subtlety in cornsnakes than can be taught in any book. This guide is intended to act as a starting point and a reference, as opposed to an all-encompassing knowledgebase. A working knowledge of how morphs come about, combined with common sense, will go a long way toward gaining valuable experience.

The best way to become familiar with cornsnake morphs and all their variations is to see as many examples of each of them as possible. Internet forums have a lot of pictures, and breeders' websites are another good resource. If you can attend reptile shows, browsing all of the tables and talking to the breeders is another good way to gain additional experience.

This book is also intended to serve the hobby the same way a dictionary serves a language. It does not define the language; it attempts to reflect the common usage. The hope is that, with a common reference to the language, we can all understand each other a little better.

Since the "language" of the cornsnake hobby consists almost entirely of slang, you will undoubtedly hear differing usages of the terms in this guide. You'll also hear words that do not appear in this guide at all. The author will attempt to keep up with any common usages within the mainstream of the hobby, and a new edition will be published each year.

Again, the guide is not intended to cover every single usage in every possible way, just the ones that have been used commonly enough that they have gained credibility amongst a large number of hobbyists. Just because a term or morph name does not appear in this guide, it doesn't necessarily mean that a certain term is invalid or a certain morph is fraudulent.

***About the "Common Price Index" for morphs*:**

This guide includes a "price range" for each morph. The listed prices are included to give the reader a general idea of the current market prices of different morphs. They are calculated using a complex formula designed to determine a reasonable "ballpark" range. By no means are they a suggested price, nor are they necessarily the average.

Note that the prices are based on hatchlings. Lone females are often sold at 10% to 25% more than the cost of a single male because breeders find it more difficult to sell off remaining unpaired males.

Adults and juveniles are usually a lot more expensive than hatchlings, since they will be able to breed sooner. Proven breeders (snakes that have already produced offspring) are even more valuable.

All cornsnakes of the same morph are **not** created equal. Variations in price are based on factors such as:

- how common they are
- how difficult they are to produce
- how popular they are
- local availability
- the quality/distinctiveness of an individual breeder's bloodline(s) compared to other bloodlines of the same morph
- being het for additional genetic traits.

Many morphs can vary wildly in price, in some cases more than twice as much as others of the same morph. Trying to quote prices is like trying to predict the weather six months in advance, so take these numbers with a large grain of salt.

Finding the same morph for a lower price is not necessarily a better bargain… you tend to get what you pay for. Do not assume that any price above the listed range is overpriced. All cornsnakes are unique, and there may be a very good reason for the higher price tag.

Types of Morphs

There are three basic ways new morphs can come about:

- Genetic Traits
- Selective Breeding
- Hybridization/Intergradation

A ***genetic trait*** (more specifically "simple" genetic trait) results from a single, identified gene. If the genetic types of the parents are known, a simple set of rules can be applied to predict the ratios of offspring with these traits. An advantage of genetic traits is that they can be outcrossed (bred to unrelated individuals) and easily recovered in two generations.

If you plan on breeding your cornsnakes, it's a good idea to understand how the rules of inheritance work, what "het" means, how offspring are labeled, and how having hets can affect the outcomes of your breedings. The Quick Genetics chapter and online tutorial are made for that purpose.

Selective breeding (or *line breeding*) is a long-term program, where a breeder selects offspring that are closest to the desired appearance. For example, you could take the offspring from a clutch and choose those with the longest saddles, and breed them to each other. Keep doing this for several generations, and each time the saddles will get longer and longer. This happens because there are a lot of genes affecting this outcome. With each new generation, you are selecting those with more of the desireable genes and less of the undesireable genes than the previous generation. Outcrossing (breeding to unrelated lines) will generally create offspring who show varying degrees of the "desired" influence.

This is an important difference from simple genetic traits. When outcrossing a simple genetic trait, you only lose one gene, and need to recover a single "gene pair" in order to recover the trait. This is like flipping two coins and trying to get two of them to land on heads, which is a simple matter when you get 10 or more tries… an average clutch size for cornsnakes.

With selectively bred morphs, outcrossed offspring will have lost about half of the *many* genes affecting the appearance. In order to recover the original appearance, it is necessary to gather *all* of these genes together again. This is like flipping a lot of coins, and trying to get *all* of them to land on heads. As a result, these looks cannot be recovered so easily after outcrossing.

Selectively bred looks are not the result of any known genes, and their inheritance cannot be accurately predicted. Although a lot of cornsnakes are labeled as “het” for many of these looks, they cannot be properly considered “het” for any selectively bred morph because there is no assurance that they will breed true with any other cornsnake of the same morph.

That is, when unrelated similar-looking individuals are bred together, the offspring may or may not show the desired “look” that their parents do. Keep this in mind when working with selectively bred morphs.

Hybridization/Intergradation is the process of breeding to another species or subspecies. Some examples of this have become commonly accepted as “morphs.”

Additional morphs can be produced through combining these methods:

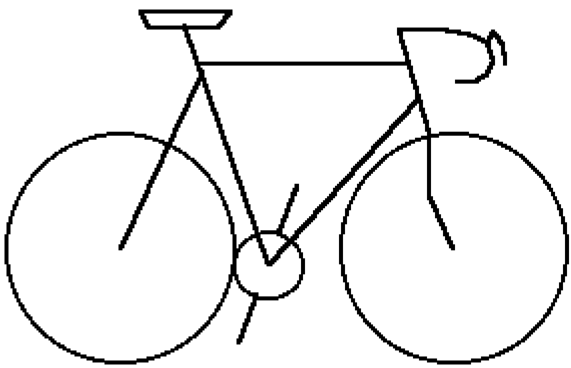
- Selectively breeding individuals all having the same genetic trait has produced several new and distinctive morphs. (Candycane, sunglow, etc.)
- Multiple genetic traits can be bred into the same cornsnake. Generally, both traits are expressed at the same time, producing something that looks different than both of the “founding” morphs. Currently, the majority of cornsnake morphs are a result of combining genetic traits. (Snow, caramel motley, etc.)
- Selective breeding can be applied to a “genetic combination morph” to exaggerate certain characteristics. (Pink and green snow, etc.)
- In the most extreme example so far, selective breeding of intergrades exhibiting a genetic trait has produced at least one new morph: a “sunglow” variation of the “creamsicle.”

Quick Genetics

Many cornsnake morphs are based on genetic traits. This quick outline is meant to give the reader the general idea of how these morphs come about, how they are reproduced, and a few important terms used to describe them. For a more in-depth genetics primer, and to learn how to predict outcomes of any breedings, the author has a web tutorial located at:

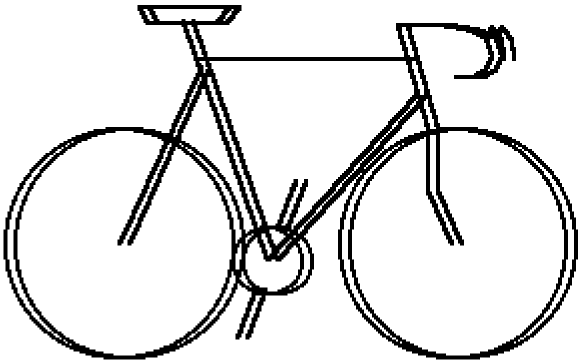
http://serpwidgets.com/cornsnakes/genetics/genetics.html

Basic biology, and genetics:
The genetic code of a cornsnake is a blueprint for how to build a cornsnake. This can be compared to a blueprint for a bicycle.

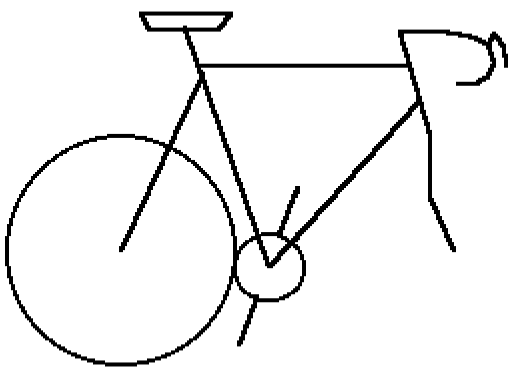


Genes are comparable to the different parts making up the blueprint, such as the seat, the wheels, the bars, the pedals, etc. Each one of those parts works the way a gene works in the genetic code: it says what a part should look like and where to put it.

The odd thing about genetics is that animals have two parents, and *two* copies of their blueprint. They get one complete copy from each of their parents. These blueprints are then laid over each other like a transparency in order to construct the final picture, like this:



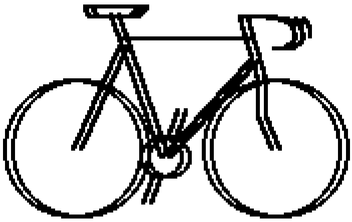
As you know, cornsnakes are not all identical. The reason is that there are variations in the genes from one individual to the next. In terms of the bicycle blueprint, the basic layout of the blueprint is the same, but some copies might be missing the front wheel, or have an extra axle, or have a different type of handlebars.



Any non-normal gene is called a *mutant*. The first example is the missing wheel. In genetics, the more common gene (the one *showing* the wheel) is called "normal" or "wild-type." The one not showing the wheel is the *mutant*.

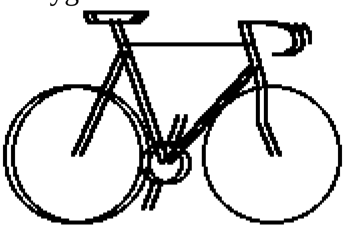
Since there are different blueprint parts, an individual can have two different copies, or two similar copies. That is, the pair can be Normal/Normal, or Normal/Mutant, or Mutant/Mutant.

Homozygous Normal



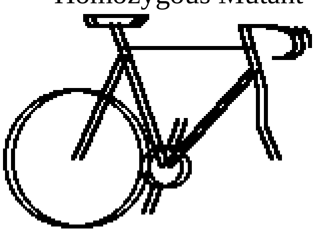
(Normal appearance)

Heterozygous for Normal and Mutant



(Normal Appearance)

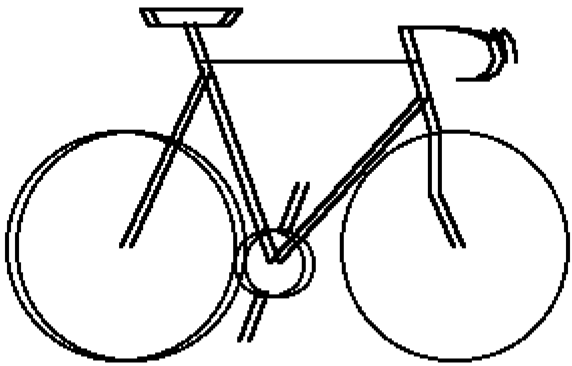
Homozygous Mutant



(Morphed appearance, no front wheel!)

When the pair is made of different copies, it is called "*heterozygous*," which is almost always shortened to either "*het*" or "*hetero*." When they are identical, this state is called "*homozygous*," which is often shortened to "*homo*."

What happens when a gene pair is made of two different genes? (That is, it's *heterozygous*.) Even though one copy is missing the front wheel, the other copy still shows it. When the blueprints are overlapped, nothing is missing.



As a result, the bicycle built from those blueprints is the same as any bicycle built from two "good" copies of the blueprint. The "missing wheel" didn't affect anything!

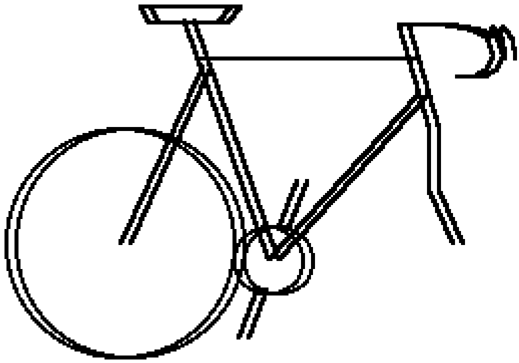
In this case, the "missing wheel" blueprint is *recessive* to the normal blueprint.

Conversely, the normal blueprint is *dominant* to the "missing wheel" blueprint… it dominates the outcome.

Because of this dominant/recessive type of relationship, a cornsnake can carry mutant genes that are not expressed visibly.

In cornsnakes, this same effect happens with many mutant genes. That is, if one copy of the mutant gene is paired with one copy of the normal gene, the snake will look like any other cornsnake. These are often labeled as hets, and as you will see later, there's good reason that being "het" can be worth more than not being het.

If a recessive gene can't be seen, how does it ever show up? It shows up (is expressed) when both copies are the recessive one, like this:



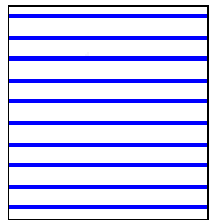
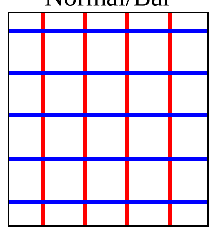
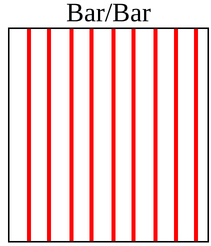
Since there is no front wheel seen on the blueprint, the bike would be built without a front wheel. In cornsnakes, it is this type of mutant that changes the pattern or one/some of the colors. The majority of cornsnake morphs are created and reproduced by using recessive mutants.

Two other terms commonly used in genetics talk are "genotype" and "phenotype." The genotype is simply the actual genes in a given individual, regardless of its appearance. The phenotype is the appearance of a given individual as a result of its genes. Our bicycle can have three genotypes and two phenotypes:

Genotype: (gene pair)	***Phenotype: (appearance)***
Normal / Normal	Normal bike
Normal / Missing Wheel	Normal bike
Missing Wheel / Missing Wheel	Bike with no front wheel

Not all gene pairs have a completely *dominant*/*recessive* relationship. In some cases, different genes in the pair can be expressed at the same time.

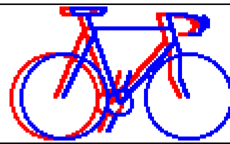
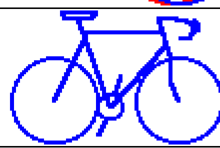
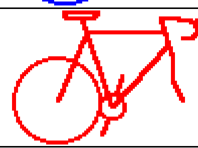
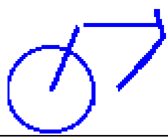
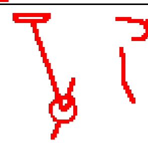
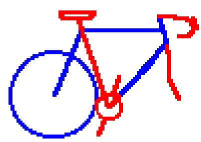
Consider a normal pattern that only has sideways blue stripes. Normally, both genes in the pair say, “make blue sideways stripes.” What happens if that gene also has a mutant version that makes vertical red bars instead? Let’s call it the “bar” gene.

Usually there are two normal (blue stripe) copies. This creates the blue “striped” pattern.	Normal/Normal  Striped
When one bar gene is paired with one normal gene, both genes are expressed. The result creates a plaid pattern of blue stripes and red bars.	Normal/Bar  Plaid
When both copies are the bar gene, there is no “stripe” gene at work, so the pattern is made only of vertical red bars.	Bar/Bar  Barred

This relationship is known as “*co-dominant*.” The difference between a *dominant/recessive* relationship and a *co-dominant* relationship is the number of phenotypes. *Dominant/recessive* pairs only create two phenotypes. *Co-dominant* pairs create three different phenotypes. (Striped/Plaid/Barred in this case.)

Now that you know how gene pairs in the blueprint can affect an individual's look (phenotype) the next step is how the blueprints are passed from parents to offspring.

Each offspring only gets one of its mother's blueprints and one of its father's blueprints. That means it gets only half of its father's genes and half of its mother's genes.

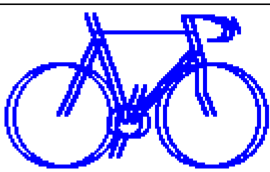
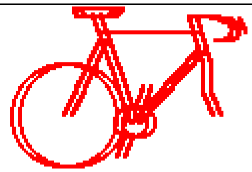
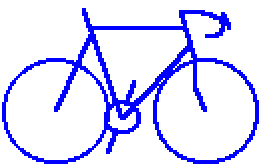
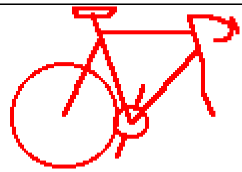
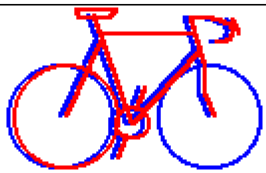
The father has two copies. He passes only one complete copy in each sperm. His two copies must be split up first.		
Instead of giving an entire copy at a time, it gives pieces from each blueprint.		
Notice that the blueprint with the "missing wheel" (on the right) has been chosen for this sperm cell.		
These are put together in a sperm cell to pass to an offspring. The same process makes each egg in the mother.		

The egg and sperm are then combined to make an offspring with two blueprints, just like the parents. As you can see, this sperm cell has the "no wheel" mutant. But since the father has one "normal" (front wheel) copy, it could have gotten the normal version instead.

As a result of this process, a parent who is het for a recessive trait can pass either the normal or the mutant gene to any of its offspring. If both parents pass the same recessive mutant gene to the same offspring, that offspring will express (show) the mutation.

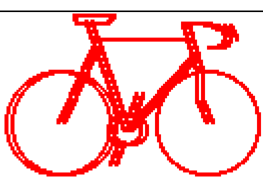
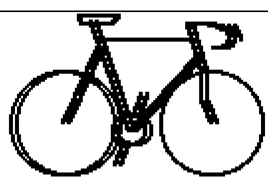
Another important consequence is that the mixing of the blueprints allows different mutations to be combined into the same individual. Cornsnakes have tens of thousands of genes, and a handful of single-gene traits have been identified. In cornsnakes, traits are combined to make even more varieties of genetic morphs. To demonstrate, let's use the same "missing wheel" mutant, and introduce a second mutant called "missing seat."

First, start by crossing an individual with the missing wheel to an individual with the missing seat:

Father		**Mother**
	X *(bred to)*	
	← Sperm Egg →	
Father gives "missing seat" mutant to all offspring. →		← Mother gives "missing wheel" mutant to all offspring.

Notice that when the sperm and egg are combined, the offspring are all normal looking. But they are all carrying the two hidden mutant copies. That is, they are "double het." (These are the first generation, and are called the "F1.")

When the F1s are crossed to each other, it creates the second generation, which is called the F2. The blueprints in each parent are mixed again before being passed down, and this time, many different outcomes are possible.

	X	

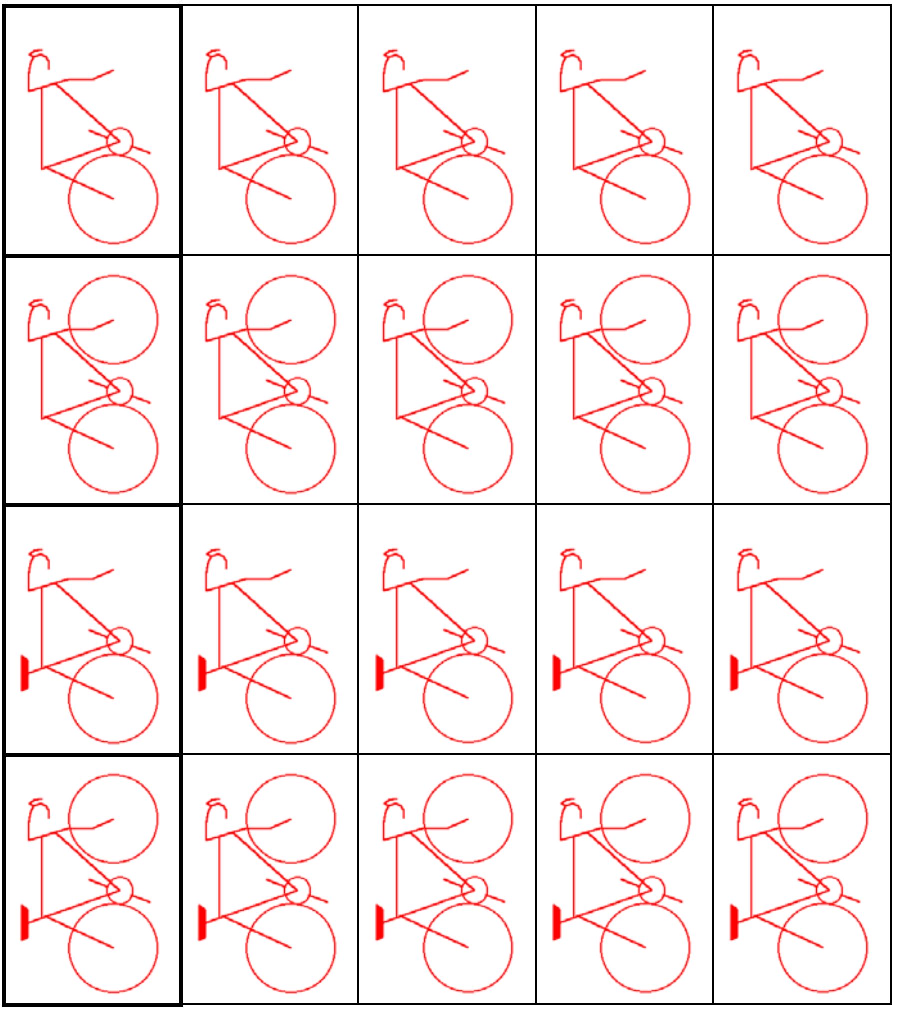


Figure 1 *- Results of F1 cross. Father (red) is double het for "no seat" and "no wheel." Mother (black) is double het for "no seat" and "no wheel."*

The different types of sperm are in red. The different types of eggs are in black. The 16 *overlapping* squares represent the possible offspring, and show the blueprint they received from each parent. As you can see, four of the sixteen have no seat, four have no wheel, and one of these (in the lower right corner) is missing both the seat *and* the wheel. The two traits have been combined in that individual.

Hets can be valuable even though they look normal. When bred to an individual het for the same trait, or an individual expressing the trait, they can produce offspring who express that trait.

A graphic representation makes the results easier to see, but it's more difficult to write down on paper every time you want to determine the outcome of a cross. When this method is used, letters commonly represent each gene involved in the cross. For example:

- The dominant "wheel" gene could be represented by **W**.
- The recessive "no wheel" would be **w**.
- The dominant "seat" gene could be **S**.
- The recessive "no seat" would be **s**.

Using these letters, the graphic can be made into this:

	S W	**S w**	**s W**	**s w**
S W	SS WW	SS Ww	Ss WW	Ss Ww
S w	SS Ww	SS **ww**	Ss Ww	Ss **ww**
s W	Ss WW	Ss Ww	**ss** WW	**ss** Ww
s w	Ss Ww	Ss **ww**	**ss** Ww	**ss** **ww**

Color key: *Het for "no seat."* ***No seat.***
Het for "no wheel." ***No wheel.***

This is known as a Punnett square, and it is one of the more common ways to determine what types offspring can come from a given cross, and how likely it is to hatch each type.

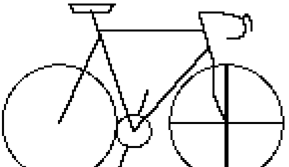
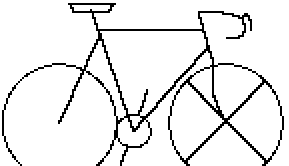
Mimics

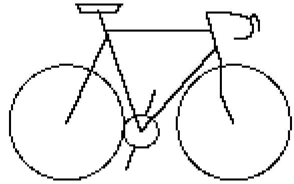
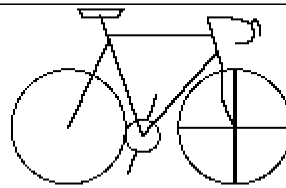
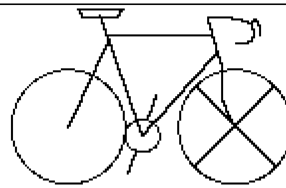
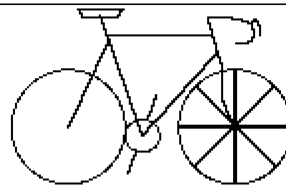
Sometimes, different traits can mimic each other. One way to illustrate this is with the nuts that hold the front axle. Say the right nut and the left nut are independent parts of the blueprint, and we have "missing right" and "missing left" mutations, as well as the normal versions of each. When a pair of blueprints has both copies of the "missing left" trait, the left axle nut is gone and the wheel will not stay on. The resulting bicycle has no front wheel. The same thing would happen when the "missing right" trait is expressed. A visual examination could not determine which trait caused the wheel to be missing.

If you cross a "missing left" with a "missing right" the results will be similar to the "missing wheel" crossed to "missing seat." That is, the resulting offspring would carry each of the two different mutations and look normal. As a result, two such traits would be expressed the same way, but independent of each other. These are known as "mimics" and can cause some confusing results. In cornsnakes, *anerythrism* and *charcoal* mimic each other, and *hypomelanism* and *sunkissed* are believed to mimic each other.

Alleles

Sometimes, two or more traits can result from different mutations of the same gene. For example, say the front wheel on our bicycle normally has a "wheel cover," which is why you don't see the spokes.

A mutation of the front wheel, which could be called **Mag A**, causes the wheel to have four spokes instead of a wheel cover, like this:	
Another mutation of the front wheel, called **Mag B**, might cause the wheel to have four different spokes instead of the wheel cover, like this:	

When the "wheel cover" is present in either one or both copies of the blueprint, you cannot see the spokes. The bike is normal. (This means **Mag A** and **Mag B** are each *recessive* to the normal type.)	
When the **Mag A** mutation is present in *both* copies of the blueprint, there is no wheel cover and you can now see the four straight spokes.	
When the **Mag B** mutation is present in *both* copies of the blueprint, there is no wheel cover and you can now see the four diagonal spokes.	
When it is het for **Mag A** and **Mag B**, one blueprint has the **Mag A** copy and the other blueprint has the **Mag B** copy. There is no wheel cover. But this time *both* the straight *and* diagonal spokes are present and visible.	

In genetics terms, the **Mag A** and **Mag B** genes are called *alleles*, meaning they occupy the same exact part of the blueprint. The **Mag A** and **Mag B** alleles are both *recessive* to the wheel cover (normal) and are *codominant* to each other.

In cornsnakes, a similar situation exists with motley and striped corns. The two traits appear to act like *alleles*. Like our "mag" mutations, they are both recessive to the normal pattern, but codominant to each other.

Once you've finished this chapter, the following should all make sense to you. It usually takes a few times to absorb this information, so it is helpful to re-read it (on a few different occasions) until it sinks in.

- Each individual has two complete blueprints.
- Genetic traits are caused by a *mutant* gene.
- Each individual has two copies of a given gene.
- These two copies can be the same as each other, or different.
- When a gene pair is made of two identical copies, it is *homozygous.*
- When a gene pair is made of two different copies, it is *heterozygous.*
- Recessive genes are not visibly expressed when they are paired with a dominant counterpart.
- Dominant genes are visibly expressed whenever they are present.
- In co-dominant gene pairs, both genes are visibly expressed.
- Each trait is inherited independently from other traits.
- The same individual can express none, one, or many genetic traits.
- Genetic traits, caused by different genes, can *mimic* each other, but are inherited independently.
- More than one mutant can exist for a given gene. These are known as *alleles*.

Normal Cornsnakes

In order to understand what variations there are, it is necessary to be familiar with the normal appearance of cornsnakes, including natural variations on the theme.

A normal cornsnake pattern is composed of three pigments:

- Melanin – Pronounced **Mel**-uh-nin, this produces the browns and blacks.
- Erythrin – Pronounced **Air**-ee-thrin, this produces the reds.
- Xanthin – Pronounced **Zan**-thin, this produces the yellows.

- The ground color is anywhere from light gray to tan to orange.
- The pattern consists of red saddles, which go down the top of the back.
- The saddles are outlined in black.
- Starting from the edge of the belly to varying points on the side, there are generally one or two rows of side blotches.
- Often the blotches on the side are connected to either the dorsal saddles, or the lower blotches.
- Yellow pigment often grows in during the first year or two after hatching. It will be most visible on the sides of the jaw and neck.
- Two longitudinal stripes, generally a gray or “dirty” color, can appear along the length of the snake, at about the ten o’clock and two o’clock positions on the back.
- Two additional dark longitudinal stripes can appear, one along the middle of each side.
- The belly is similar to a basic black and white checkerboard pattern. Some color, usually red or a light red/tan, can wash over the white parts of the belly.

Hatchlings will start out with very little of the red, yellow, and orange coloration. To many beginners, hatchlings look like anerythristics or some “odd morph.” The saddles will be a deep burgundy or brown, and the ground color is in shades of gray or tan, with orange “dots” of color visible between the saddles, especially on the neck. The colors grow in as the snake matures, and generally reach their peak when the snake is about 3 feet long.

There are many variations on this basic “normal” theme, all of which are still considered normal. They include, but are not necessarily limited to:

- Longer, shorter, wider, or thinner saddles.
- Fading out of two areas inside the saddles, one on either side.
- Fading out of a large area in the middle of the saddles.
- A few saddles being offset or smashed together, forming a **U** or **S** or **Z** or **W** shape.
- Thicker or thinner borders around the saddles. (Thinner borders can be gray instead of black.)
- White stippling around the outside of the black borders.
- Absent or more prominent “dark” longitudinal striping. This can also turn a light gray in adult cornsnakes.
- A great deal of variation of “general darkness” in the overall colors of the snake can be found among normals.
- Some belly checkers missing or bunched up.
- Belly checkers fading to brown, light tan, or reddish tan.
- A thin “stripe” of white running down the center of the belly.

Simple Genetic Traits

For a quick reference, with simple recessive traits:

If one Parent is:	**And the Other parent is:**	**then the Normal offspring are:**
Morphed	Morphed	Morphed (*no normal offspring*)
Morphed	Het	Positive (100%) Het
Morphed	Normal	Positive (100%) Het
Het	Het	Possible (66%) Het
Het	Normal	Possible (50%) Het
Normal	Normal	Not Het.

- These rules apply **independently** for each trait. That is, an individual can be expressing one trait, 100% het for another two traits, 66% het for a fourth trait, 50% het for a fifth trait, etc.
- These rules apply **only** to proven “simple recessive” genetic traits. A snake cannot be het for a non-genetic trait, nor can it be het for a selectively bred look.

Amelanism, aka **Amel**, **Albino**, **Red Albino**.
(*recessive*) ($20-$50)
This trait removes melanin, which is the black pigment. Areas where black would normally appear will instead be white, yellow, pink, or even “greenish” looking. The eyes are a distinctive glowing red/pink, except for a small dark spot toward the front of the eye.

Hypomelanism, aka **Hypo**, **Standard Hypo, Hypomel**, **Hypo A**, **Rosy**.
(*recessive*) ($20-$50)
This trait reduces melanin. The oranges and reds are generally “cleaner,” the black borders are often thinner, and the belly checkers often are bronzed. However, these are not absolute indicators of hypomelanism and visual identification of adults can be tricky. A cornsnake that has lighter/cleaner colors, thinner than normal borders, or bronzed belly checks, is not necessarily a hypo.

In some cases, the darkest hypos can be darker than light-colored normals. Hatchlings generally have a lighter brown/red tone to the saddles compared to normals. The best identification is made by comparing hatchlings, where hypos are generally quite obvious compared to non-hypo siblings. **Some believe it is possible to identify hets by certain appearances, but this has not been proven to be true.*

There is also some controversy over the true nature of this trait. Generally, it acts like a simple-recessive genetic trait and should be considered as such for practical purposes. However, be aware that occasionally it doesn’t fit that description: sometimes a hypo to hypo pairing can produce non-hypo offspring. Several theories attempt to explain this, but none of them have been proven yet.

Sunkissed, aka **Hypo B, Sunkissed Okeetee, “Hypo Okeetee”**.
(*recessive*) ($50-$70)
Like hypomelanism, this trait reduces melanin. However, this is a different gene than the one causing hypomelanism. Crossing sunkissed to hypomelanism will **not** produce hypo offspring. It is currently believed that cornsnakes expressing this trait will be indistinguishable from those expressing the previous type of hypo unless the ancestry is known. That is, it is a *mimic* of hypo. Currently, some corns are labeled as “hypo Okeetee” but are based on the standard hypo gene, not the sunkissed gene. Be sure you know which type of hypo you are getting if you plan to breed to other hypos.

Lava, aka **Transparent Hypo**, **Transparent**, **Trans**. (possibly “Ultra Hypo”)
(*recessive*) ($80-$120)
This is the third form of hypomelanism to be discovered, and it acts similarly to the other two hypo traits. So far, it appears to have a more extreme expression and may not be another mimic of hypo. It has not been outcrossed very far, and it could end up being indistinguishable, too. Hatchlings can appear almost amelanistic. It looks similar to what some are calling “ultra hypo.”

Ultra Hypo, T+ Albino (and other "hypo" types)
(*unknown*)
The term "ultra" has been applied to many different hypos. Other terms including "T+ albino" have also been applied to what may be genetic hypo types. Some of them appear to be related to each other. To the author's knowledge, none of this has been worked out to determine if any or all of them are one (or any) of the above hypo types, or a new type altogether. If you plan to breed them, be sure to know what other hypos you have, and ask the breeder/seller which known lines they are compatible with.

Anerythrism, aka **Anery**, **Anery A**, **Aneryth**, **Black Albino**.
(*recessive*) ($20 -$40)
This is pronounced "**An-**ur-ee-**thris-**tik," or abbreviated to "**an-**ur-ee." This trait removes the red and orange colors, leaving the snake shades of blacks, grays, and browns. The typical yellows on the chin/neck/belly are unaffected. The cheeks often have a pinkish "blush" tone to them. A few red freckles may appear on the body of the snake. These usually appear after a shed, and can stay for the rest of the snake's life. Hatchlings are an attractive black and silver.

Charcoal, aka **Anery B**
(*recessive*) ($30-$60)
This was the second type of anerythrism to be discovered, and in many ways it mimics anery. It is, however, genetically different than anery. As a result, crossing anery to charcoal produces normal offspring. As in anerys, the cheeks often have a pinkish "blush" tone to them.

As a broad generalization, charcoals have a darker ground color and are lower in contrast than anerys. However, there is so much variation in both anery and charcoal that they often look similar to each other. Hatchlings generally have a purplish cast to them, and tend to look slightly different than anery hatchlings. Adults cannot be reliably identified by looks alone, so be sure you know which type you are getting if you plan to breed them.

A common myth is that charcoals do not develop yellow on the chin/neck and that anerys do. Originally this was true, but this myth has been dispelled as charcoals with yellow on them, and anerys without yellow, have appeared. The appearance or absence of yellow is ***not*** *a reliable way of determining the difference.*

Caramel
(*recessive*) ($30-$50)
Caramel appears to reduce the red, and possibly adds a yellow wash over the entire body. The colors are generally in shades of brown, with the ground color being lighter and having a yellow wash over it. Some hatchlings can look very similar to anerythristic hatchlings before the yellows appear. **Some believe it is possible to identify hets by certain appearances, but this has not been proven to be true.*

Lavender, formerly known as “Mocha.”
(*recessive*) ($100-$150)
As adults, lavenders end up with a pattern made of dark and light shades of an odd gray color. It is impossible to describe in words. Lavenders *must* be seen in person to be fully appreciated. Hatchlings can appear somewhat similar to anery hatchlings but have a lighter “brown” saddle color.

As juveniles, many lavenders will have an odd wash of ground color. This wash can be orangish, pinkish or purplish, and as they become adults it fades. Some lavenders will have ruby-colored eyes, but it is undetermined whether or not this is related to the lavender trait itself. Ruby eyes are not a sure-fire indicator that an individual is a lavender, since some *ghost* corns also have ruby eyes.

Many lavenders, and normal corns from lavender lines, also have unusual patterns resembling *aztec* and *zigzag*. It is unclear whether or not this is directly related to, or linked to, the lavender trait. Normally patterned lavenders can also produce offspring with these odd patterns.

Diffuse, aka **Bloodred**, **Blood**.($65-$90)
(*apparently, varying degrees of recessiveness and codominance*)
A movement is growing to rename the pattern aspect of the “bloodred” morph in order to distinguish it from the selectively bred color variety also known as *bloodred*. The name “diffuse” (or the “*diffusion*” gene/trait/pattern) has been suggested.

Three main effects on the pattern are observed. The belly is wiped clear of checkers. However, some black specks or freckles can appear. The head pattern is often stretched, and the top of the head can have a “skull” type pattern on it, or be stretched so far that there is no observable “pattern” on the head. The pattern on the side of the body can be practically normal, or almost completely blurred out. (The more diffused/blurred side patterns are usually more desireable.) Hatchlings start out with a lot of gray on the head and ground color, which then develops into the reds, oranges, or browns they will have as adults.

Diffuse appears to act like a simple pattern trait. The amount of expression of this pattern can vary widely between “het” specimens, some appearing normal, some almost fully expressing the diffuse pattern. Even the most extreme-looking hets generally do not express the “blurred” side pattern, and they will show traces of rectangular markings on the edges of the belly.

Motley and Striped:

Motley

(*recessive*) ($30-$55)

The motley trait clears the belly of checkers. Some motleys will have a handful of checkers, and many will have black freckles on the belly. The dorsal pattern often shows a desire to stretch lengthwise. Anywhere from a handful of saddles to all of the saddles will be connected on the outside edges, creating circles along the back. Some normal (non-motley) corns have a “psuedo-motley” pattern on their necks, so the belly is important for proper identification.

The side pattern can be unaffected, or it can be smeared out into dashed lines or even gone. The motley pattern also creates a lightening effect similar (but not related to) hypomelanism. That is, other morphs combined with motley, such as *anery motley*, *hypo motley*, *caramel motley*, etc. will often appear lighter than the same morph without motley.

Be aware that the patterns produced by this trait are **highly** variable. This is why it is named *motley*. A wide variety of dorsal patterns can result even in siblings from the same clutch.

Striped

(*recessive*) ($50-$70)

The striped trait has the same effect on the belly as the motley trait. The dorsal and side patterns will be made of four thin stripes running the length of the body. These stripes almost always have breaks in them, especially toward the tail end of the snake. Fully striped corns (with no breaks in the stripes) are very rare. Many striped corns will have an unusual head pattern that can resemble the head patterns of bloodred corns. As with motley corns, the striped pattern also creates a lightening effect similar (but not related to) hypomelanism.

"Motley/Striped" or "Striped Motley" ($40-$75)
The striped trait is related to the motley trait: they are currently believed to be *alleles*. Crossing a motley corn to a striped corn will create offspring with plain bellies and "non-normal" dorsal patterns. Generally the dorsal pattern ranges from motley-looking to striped-looking, or anywhere between those two extremes.

Selective breeding and line breeding of motley/striped cornsnakes has created some unusual and interesting patterns. Some of the results are covered in the section ***Selective Breeding Added to Genetic Traits***.

Striped Motley vs Striped
Some striped X motley (called "motley/striped" or "striped motley") individuals can have a long stripe running down the length of their body. These are not "striped" corns. The difference is found in the width of the stripe. True striped corns (also known as 4-lined stripes) have a wide stripe of ground color. Motley/Striped corns have a central stripe that is thin, or varying in width.

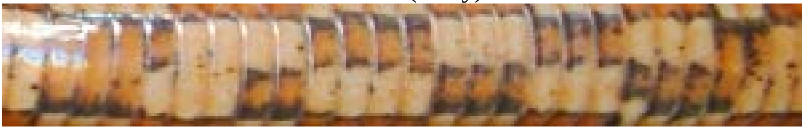
There is currently a lot of confusion about making such identifications, and there is still much to be determined about the exact relationship between the motley and striped patterns, and how they intermingle.

** There are some claims that hets for hypo will be lighter than usual, and that hets for caramel will appear "yellower" than usual. While these appearances are often observed in those hets, they can also be found in cornsnakes completely unrelated to those lines. Such theories are currently unproven and should be taken with a grain of salt. When picking hatchlings from clutches of possible hets, it is not safe to assume that the "lightest" hatchlings are more likely to be het for hypo, nor is it safe to assume that the "yellowest" hatchlings are more likely to be het for caramel.*

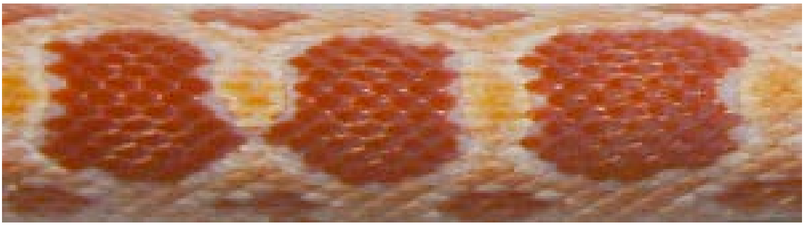
The following pictures represent fairly typical examples of how each trait alters the normal appearance. As with normal cornsnakes, there is a lot of variation among individuals expressing the same trait.

Normal

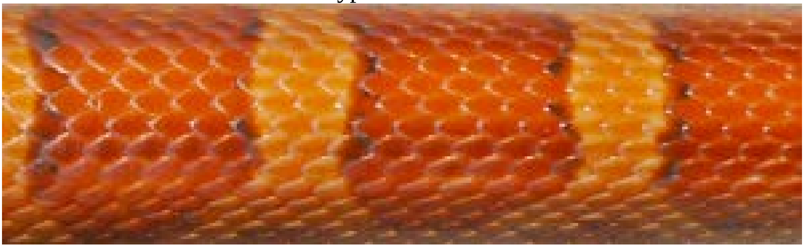
Normal (Belly)



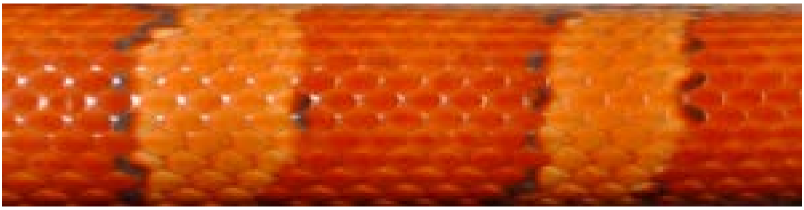
Amelanistic



Hypomelanistic

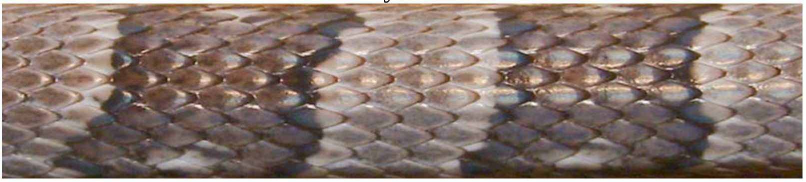


Sunkissed

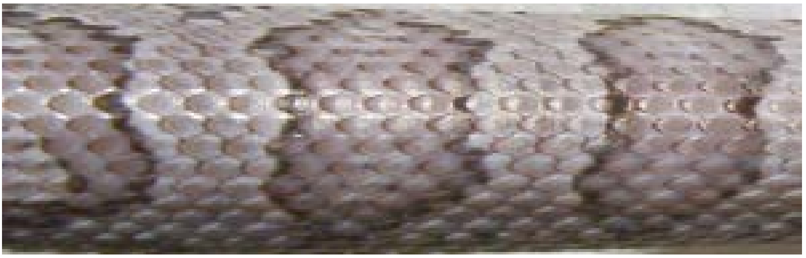


Lava

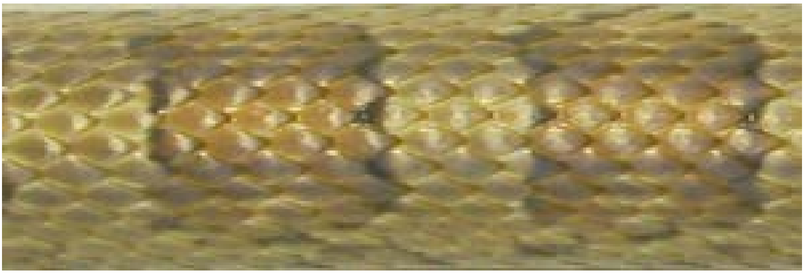
Anerythristic



Charcoal

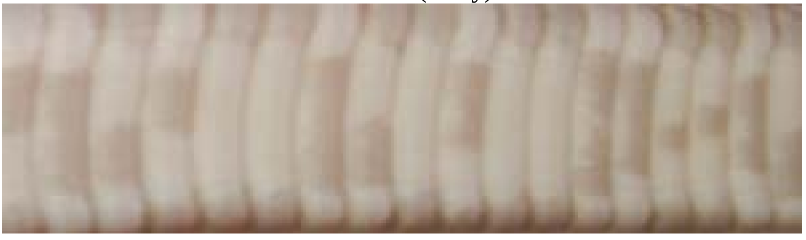


Caramel

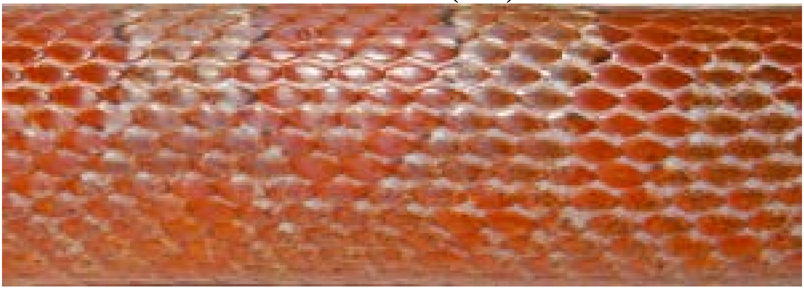


Lavender (Dorsal)

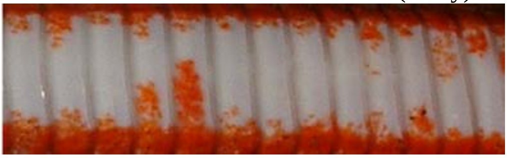
Lavender (Belly)



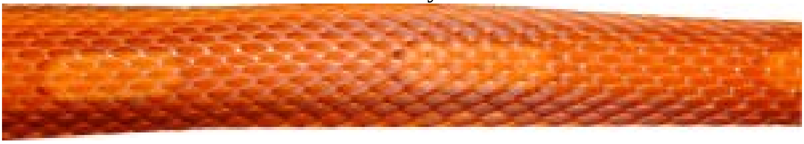
Diffuse/Bloodred (Side)



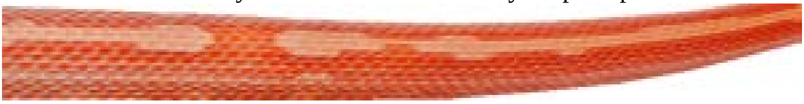
(Head) Diffuse/Bloodred (Belly)



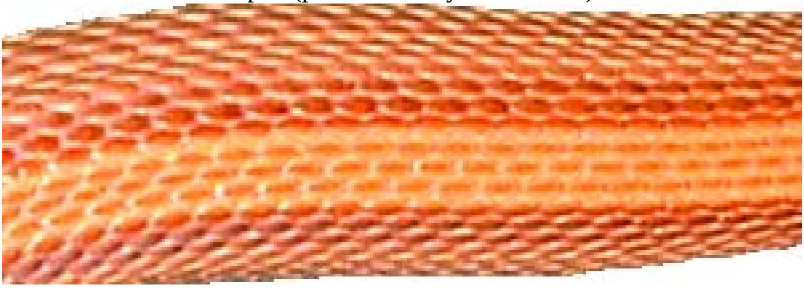
Motley



One of many variations of the “motley/striped” pattern



Striped (photo courtesy of Kat Hall)



Checkerless belly, typical of motley and striped corns

Selectively Bred Variations

Okeetee (Okeetee Phase) ($25-$50)
Pronounced "Oak-uh-tee." There are two main uses of this word:
The original meaning refers to a locality, and some people are interested specifically in corns from this locality. The stereotypical Okeetee corn has extremely bright orange and red colors separated by thick, bold black borders. Okeetees are generally considered the most attractive natural variation of cornsnake. They are also referred to as *Hunt Club Corns* or *True Okeetees*, in an effort to distinguish them from the second type.

Another meaning has branched off from this, and is widely used. It refers to corns having the stereotypical "look" of Okeetee locality corns. Many of these have been produced. They will have some, little, or no connection to any corns from the actual locality. They are also referred to as "look-eetees" or "Okeetee Phase" in an effort to ensure the buyer doesn't assume they are locality corns. Cornsnakes cannot be het for Okeetee or Okeetee Phase.

Miami Phase ($25-$50)
The name "Miami phase" was coined to describe a look that is often found in corns coming from that area. The ground color is gray, tan, or somewhere between. Cornsnakes from anywhere can take on this look, so the name does not imply a locality, nor does any corn coming from that area qualify as a "Miami phase." Hatchlings have a clean gray ground color. Individuals with the least traces of orange on the neck tend to generally turn out with the cleanest gray ground colors as adults. Cornsnakes cannot be het for Miami phase.

Upper Keys corn, Keys corn, Rosy Ratsnake ($30-$50)
Cornsnakes from the Keys tend toward an overall lighter appearance, similar to hypos. The belly checkering is generally not as strong, or is even absent. The ground color tends more toward shades of tan, and there is generally less contrast between ground and saddle colors. The black borders around the saddles are less prominent than in typical corns, or entirely absent. Cornsnakes cannot be het for "upper Keys" or "rosy ratsnake."

Kisatchie, *Slowinskii* ($75-$100)
These come from certain areas of Louisiana and are thought by many to be an intergrade between cornsnakes and emoryi ratsnakes. They have recently been classified as a separate species, *Pantherophis guttata slowinskii*. Colors are in dark browns and grays and can look somewhat like very dark Anerythristic cornsnakes. Cornsnakes cannot be het for Kisatchie.

Milksnake Phase, Banded ($50-80)
These have been bred to have wide saddles, or saddles which connect to the side blotches for a banded look. Some milksnake phase lines have been crossed into motley lines. Cornsnakes cannot be het for milksnake phase, or banded.

Aztec, **Zigzag** ($30-$60)
The zigzag pattern results from the left and right sides of the saddles being offset from each other, creating a "zipper" type of pattern. Aztec is an aberrant pattern that often has small pieces of colors strewn about, as if the saddles were made of glass and had been shattered. Some individuals will show both zigzag and aztec type patterning. Individual cornsnakes can show varying degrees of either of these patterns, and selective breeding of the most extremely patterned individuals generally creates the most extremely patterned offspring. These are very unpredictable patterns. Sometimes crosses – even between parents with the best patterns – produce normally patterned offspring. In other cases, normally patterned parents can produce extremely odd patterned offspring.

Cornsnakes with aztec or zigzag parents are commonly listed as "het" for zigzag or aztec. Do not assume they will produce these patterns in the same way as proven genetic traits do.

Okeetee phase

Miami phase, with silvery ground color

This side view shows “banded” type saddles.

This charcoal shows some Aztec pattern.

Other variations…

Many breeders selectively breed to establish certain looks in their own lines. When they are satisfied that a line is sufficiently different to warrant a name, they will apply one. On the other hand, some breeders or resellers will simply apply a name in order to try to sell their product more easily, because it implies that the snakes are "special." Do not assume that a cornsnake with an unrecognized name is automatically special, but don't assume it is a scam either. If you think they would be a good addition to a breeding project, ask the breeder:

- What is special about the individuals with that name?
- How were they produced?
- Are there any known genetic traits involved?
- Do they "breed true?" (If I breed two of these together, will the offspring look like these?)
- Are any other unusual or notable tendencies in that line?

Someone who has worked hard on a project will have a lot to say about them. Someone who has simply attached a name in order to sell something will not have much to say. In the latter case, that type of corn still may be a good addition to your projects, but you will not have as much information about what you are working with.

Combinations of Genetic Traits

Several genetic combinations have become common enough to have trade names. These are listed below.

Snow – amel and anery.
Blizzard – amel and charcoal.
Butter – amel and caramel.
Opal – amel and lavender.

Ghost – hypo and anery.
Phantom or Charcoal Ghost – hypo and charcoal.
Amber – hypo and caramel.

Pewter or Pepper – diffuse and charcoal.

Note that the motley or striped patterns can be mixed with the colors. These are denoted by adding motley or striped to the beginning or end of the name. For example, "striped snow," and "butter motley."

Below is a list of two-trait combinations. Not all possible combinations have been produced, and some have only been produced in small numbers so far. Some combinations are left out of this list because accurate descriptions are not possible until a good number of them have grown up to adult size. Remember, there can be as much variation within any morph as there is between normal cornsnakes. The descriptions and photos are meant to be examples, and are by no means the limits of what could be created by selectively breeding a given trait combination.

Combinations with Amelanism:

- Amel + Anery – ($25-45) **Snow**. This is one of the most common double morphs. As hatchlings, saddles are pink on a white background. If saddle borders are present, they will appear "clearish." As they mature, the saddle colors can fade in contrast, or turn a more pastel orange-like color. Saddle borders can develop yellow or mild "green" colors.
- Amel + Charcoal – ($40-80) **Blizzard**. These are similar to snow, but generally have a less noticeable pattern, as the saddles are a

pinkish white. Hatchlings can appear virtually patternless. Yellow rings sometimes grow in around the saddles.

- Amel + Caramel – ($50-100) **Butter**. As hatchlings, these can sometimes resemble snows. Butters can range in appearance from almost "snow-like" to almost "amel-like." Saddle colors tend to range from yellow to a dark brownish orange, and the ground color ranges from white or off-white to shades of yellow.

- Amel + Lavender – ($150-200) **Opal** corns somewhat resemble snow and blizzard corns. In some, the ground colors are more colorful than the saddles, which can be almost white, and they look like a snow corn with the colors reversed. As with other lavenders, a wash of orange/pink can be present, especially in juveniles.

- Amel + Diffuse – ($125-$175) This combination is gaining in popularity for those who enjoy bright amelanistics. Several breeders are working to improve "sunglow" corns by adding bloodred/diffuse lineage into the morph. Some examples grow up to have very little or no white flecks on them.

- Amel + Motley – ($30-60) Many of these tend to be very bright amelanistics. This combination is also known as "*sunglow motley*" when the ground color is a bright orange and white is absent.

- Amel + Striped – ($60-100) Similar to amel motleys, striped motleys tend to be very bright in coloration.

Combinations with Hypomelanism:

- Hypo + Anery – ($25-60) **Ghost** corns are a lightened version of anerythrism. Colors often turn to light browns, tans, and some ghosts develop "peach" and other pastel colors. It seems that males are generally more "colorful" than females.

- Hypo + Charcoal – ($60-120) **Phantom** or **Charcoal Ghost** corns are still relatively new on the scene. They tend to be slightly lighter in color than ghost corns, and some will develop "purple" or "lavender" type tones, similar to what is seen in younger charcoal corns.

- Hypo + Caramel – ($60-90) **Amber** corns have light brown saddles on a tan to yellow ground color.

- Hypo + Lavender – ($150-200) Youngsters expressing this combination are possibly the most bizarre looking corn morph to be found. The overall colors are lightened compared to lavenders, and the pink/orange wash that develops in young lavenders can be even more apparent. Currently, it appears that males of this morph tend to be more “extreme” in their expression of the hypo trait.

- Hypo + Diffuse – ($175-250) These are still relatively new and rare. It appears that the combination will produce corns of an overall lighter red/orange color than typical “bloodred” corns.

- Hypo + Motley and Hypo + Striped – ($60-$120) The motley and striped traits already have their own “hypo-like” effect. Hypo adds to this effect, so that hypo motleys and hypo stripes are even lighter than normal motleys or stripes. Some adults have nearly identical ground and saddle/stripe colors, and can appear almost patternless.

Combinations with Sunkissed:

- Since this is a relatively new trait, no combinations using sunkissed are known to exist yet. Several traits have been crossed with it so far, though, and new combinations should appear within the next few years.

Combinations with Lava:

- Lava + Anery – ($150-200) **Ice ghost** corns are relatively new and have not been outcrossed to many different lines. Currently it appears that ice ghosts will be a more extreme version of ghosts.

- Lava + Charcoal – Currently unknown. The first examples of these could hatch in 2004.

Combinations with Anery:

- Anery + Charcoal – ($???) It is almost certain that these are not visually identifiable. Current theory is that these will resemble charcoal corns, since the combination “amel + anery + charcoal “ looks like a blizzard.

- Anery + Caramel – ($???) It appears that caramel is unable to exert its influence when anery is showing. That is, caramel is masked by anery. As a result, these individuals will look like any other anery.

- Anery + Lavender – ($???) Unusual hatchlings have come from crosses that were capable of producing anery lavenders. This combination is still a big mystery, and may lead to something new over the next several years as more information is gathered about the interaction of these two traits.

- Anery + Diffuse – ($125-175) Referred to (confusingly) by a few as “pewter,” but the more common use of “pewter” is to describe diffuse + charcoal. Some males of this morph can have odd “pink” tones to their sides. This tendency appears to run in families, and it is apparently obvious enough that males and females in these clutches can be visually identified based on their colors.

- Anery + Motley – ($40-70) Many of these are similar in coloration to ghost corns. Some anery motleys are referred to as “ghost motley” even if they are not expressing the hypo trait.

- Anery + Striped – ($50-80) These are similar in color schemes to anery motleys, but some examples of this morph can become almost completely patternless. A few breeders are making an effort to produce totally “patternless” cornsnakes through this morph.

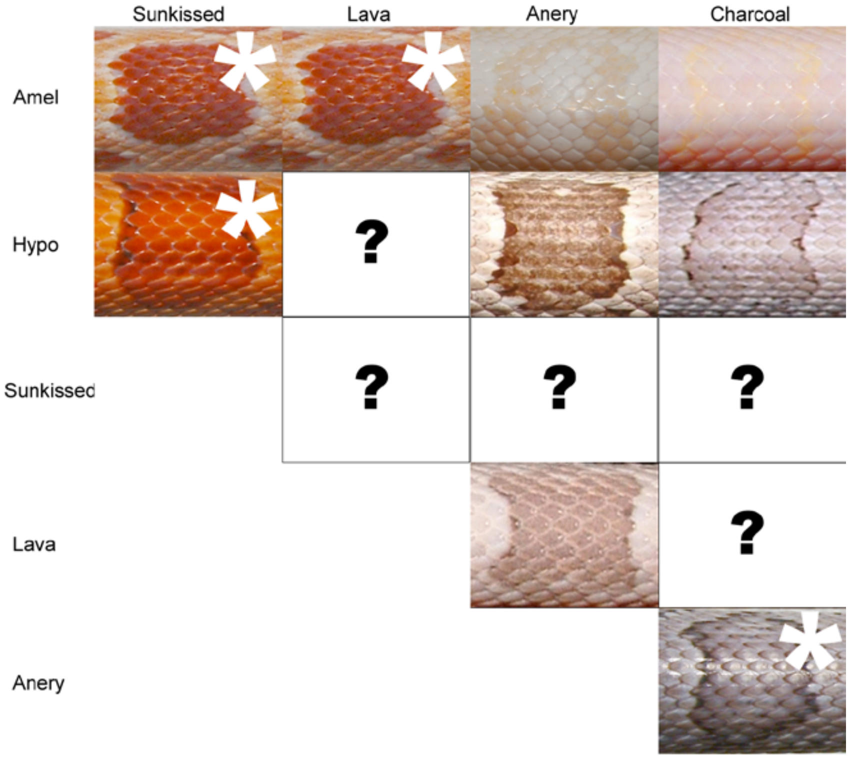
Combinations with Charcoal:

- Charcoal + Diffuse – ($65-$150) **Pewter** corns range from very dark to very light. They are also occasionally referred to as “pepper” corns, because many will have tiny black freckles making it look like the snake is covered with pepper.

- Charcoal + Motley – ($???) This morph is still in its infancy. It is unknown if these will resemble anery motleys, if they will take on colors similar to phantom corns, or if they will have a new look of their own.

Combinations with Caramel:

Caramel + Diffuse – ($???) At least two breeders have produced hatchlings of this combination. It is unknown what adults of this



Charcoal

Caramel

Lavender

Diffuse

Amel + Hypo (not shown) is assumed to look like amel.
Amel + Sunkissed is assumed to look like amel.
Amel + Lava is assumed to look like amel.

Sunkissed + Hypo is assumed to look just like sunkissed and/or hypo.

Anery + Charcoal is assumed to look like charcoal.
Anery + Caramel is assumed to look like anery.

Diffuse + Amel picture courtesy of Kat Hall.

Caramel
Lavender
Diffuse
Motley
Amel
Hypo
Sunkissed
Lava
Anery
Charcoal
Caramel
Lavender
Diffuse
?
*

morph will look like, but a better picture of what to expect should emerge over the next few years.

- Caramel + Motley and Caramel + Striped – ($70-100) As with other motley-based and stripe-based combinations, these tend to take on a "hypo" appearance and are lighter coloration than standard caramels.

Combinations with Lavender:

- Lavender + Diffuse ($???)– Only a few examples of this combination exist. It is expected to become more common over the next several years.

- Lavender + Motley and Lavender + Striped ($1000) – These are still hot items, since only a few of them exist. They should become more common over the next several years.

Combinations with Bloodred:

- Bloodred + Motley and Bloodred + Striped – ($???) Since it is impossible to make a visual identification with certainty, these will need to be proven through breeding trials. No proven examples of these combinations exist to date, but several individuals should be proven within the next few years.

Additional combinations (including triple morphs) are either in progress, entering the scene, or becoming more common. Here are some of the triple morphs:

Snow Motley ($50-80)
Striped Snow ($50-90)
Striped Ghost ($130-$170)
Amber Motley
Butter Motley ($150-225)
Butter Striped ($1000)
Opal Motley ($1000)
Opal Striped ($1500)
Hypo Pewter
Motley Pewter
Hypo Lavender Diffuse
Ghost Bloodred (Anery + Hypo + Diffuse)

Selective Breeding Added to Genetic Traits

Morphs using Amelanism:

Candycane ($50-90)
The idea is to remove the oranges and yellows from the ground color, leaving red saddles on a clean white background with striking contrast. Any ground color is undesireable in this morph, so they tend to resemble an amel version of the silvery Miami phase normals.

Since the yellow and orange ground color grows in as cornsnakes mature, some clean-looking candycane hatchlings can grow up to look less than ideal. It is not possible to predict with 100% accuracy which ones will do this as they grow up. But as a general rule, the hatchlings with the least amount of yellow or orange color, especially on the neck, will tend to grow into more ideal candycane adults. An amelanistic cornsnake cannot be het for candycane.

Reverse Okeetee, Amelanistic Okeetee, Albino Okeetee ($40-60)
The use of the name “Okeetee” with this morph does not imply the Okeetee *locality*, just a look. A stereotypical Okeetee corn has bold borders on bright colors. The amelanistic version still has the bright orange ground color and red saddles, but the black borders have been “reversed” to white.

These are often bred mainly for the thickest possible white borders, with the ground color being secondary in importance. No cornsnake can be het for Okeetee, and amelanistic cornsnakes cannot be het for this look.

Sunglow, “No-white Amel” ($40-60)
The idea is to remove all traces of white, and to get a bright orange ground color. This creates a very bright red and orange cornsnake. Some breeders will use hypomelanistic corns as a starting point, since many hypos have thinner borders. The motley pattern also tends to reduce the border thickness and get rid of a lot, or all, of the white. Some sunglow offspring will start out with white borders, which will then fade out as they mature. Amelanistic cornsnakes cannot be het for this look.

Morphs using Anerythrism:

Pastel Ghost, Pastel Motley, Pastel Ghost Motley ($50-100, varies)
Individual breeders use all of these terms differently. Generally it refers to softened pinkish saddles and/or ground colors on anery cornsnakes.

Some anerythristic motleys will get as light as ghosts and are sometimes referred to as “ghost motley” even though no hypomelanism is present. Some breeders will only use the term “ghost” when hypomelanism is present, and some will use the term based only on how light-looking the colors are.

It is a good idea to find out from the breeder which genetic combination is being expressed, especially whether or not hypo is being used in each combination. Until/unless a genetic influence causing the “pastel” look has been isolated and proven out, ghost corns cannot be het for “pastel.”

Morphs using Motley and/or Striped:

Striped Motley, Cubed Motley ($40-$75)
When a striped corn is bred to a motley corn, the direct offspring take on a non-normal pattern. As a result, a *normally* patterned cornsnake can **not** be het for the motley and striped traits simultaneously. These offspring, or anything exhibiting a mix of both patterns, are generally called **striped motley**. The belly is uncheckered, and the dorsal pattern takes on a mix of both the striped and motley appearances. Some will look more like the striped pattern and some will look more like the motley pattern. There is often a widening on the ends of the “stripes” creating a Q-tip appearance.

Generally, striped motleys can be distinguished from “true striped” corns by examining the width of the stripes. True striped corns (also known as 4-lined stripes) have a wide stripe of ground color. Motley/Striped corns have a central stripe that is thin, or varying in width.

Breeding striped motleys to striped motleys can create a great variety of patterns. One of these is referred to as **cubed**. This name is applied when the front and back of the dorsal saddles form a straight line instead of being curved, resulting in rectangular saddles.

Hurricane Motley (varies)

This variation of the motley pattern, also sometimes called *donut* motley, includes dark outlines around the circles caused by a thickening of the "border" areas, and/or fading of the central part of the saddles. Hurricane motleys come in several color morphs, and are generally priced significantly higher than normal motleys of the same color. Cornsnakes cannot be het for "hurricane."

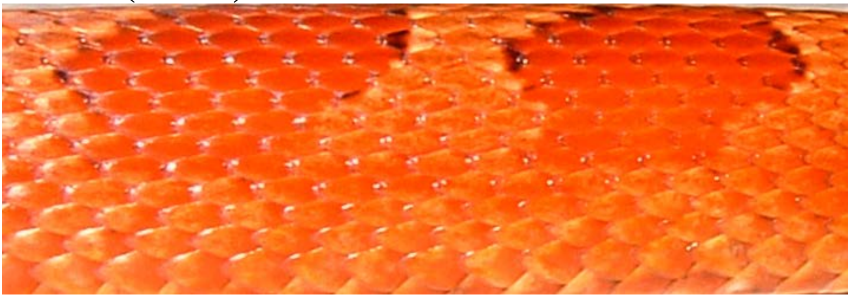
Miami Motley ($???)
A few motleys have been bred to take on the "Miami phase" look. This combines the motley pattern with a smooth silvery gray or light tan ground color. Cornsnakes cannot be het for "Miami."

Morphs using Hypomelanism:

Crimson, Hypo Miami ($50-100, varies with quality)
These are generally what you would expect from adding hypomelanism to a typical Miami phase cornsnake. The look can vary quite a bit depending on the stock a given breeder started with, and the direction they took their project. Hypos cannot be het for crimson or "Miami."

Other variations:

Bloodred ($65-$90)



This term is also (confusingly) used as the name of a pattern trait. Selective breeding of individuals expressing the "diffuse" pattern trait had originally created extremely red individuals, which were practically patternless. Cornsnakes expressing the simple genetic “diffuse” trait *and* cornsnakes selectively bred for the ideal look are both called “bloodred” corns by many people. If you want the selectively bred kind, find out from the seller what you are getting.

Generally, the best bloodreds will hatch with a completely patternless gray head or with a gray “skull” type head pattern, a belly with no black checkers or specks on it side blotches that are very smudged or even invisible, and very little visible “black” anywhere on the pattern. As they mature, the grays slowly turn into reds. It can take 5 years for a bloodred to reach its “final” coloration. Pictured above is an 8-month old hatchling.

Pink and Green Snow ($60-90)
Some snows and amelanistics can have bright yellow saddles, and show a slight greenish cast in the areas where the black borders exist on normal cornsnakes. Some breeders have enhanced this trait through selective breeding. These are dubbed “pink and green” snows. They are sometimes referred to as “bubblegum” snows, although the “bubblegum” term can cause confusion because a line of hybrids is also referred to as “bubblegum.” Cornsnakes cannot be het for “pink and green.”

Coral Snow ($???)
Certain lines of “hypo snow” (that is, corns combining anery, amel, and hypo) will produce “coral” snow offspring. The saddles tend to take on a coral color, and it is distinctive from typical snow cornsnakes. It is currently unknown whether or not the hypo trait itself is responsible for the appearance of the coral colors.

Hybrids and Intergrades

Breeding cornsnakes to many other species of North American snakes has produced hybrids and intergrades. The two most common crosses are with Emoryi ratsnakes, and California kingsnakes.

Creamsicle ($25-75)
This term has two meanings:

- It is generically applied to any corn/emoryi cross to denote that it carries emoryi blood.
- It is specifically applied to amelanistic corn/emoryi individuals.

Creamsicle projects are started by crossing an amel cornsnake to an emoryi ("great plains") ratsnake. These offspring are then either bred to each other, or to an amelanistic cornsnake. In the second generation and beyond, the amelanistic offspring (or any amel with an emoryi ancestor) are called creamsicles.

The name is a great description of their colors. They can have varying amounts of cornsnake versus emoryi blood, depending on whether they have been bred back to cornsnakes or to emoryi. The colors tend more toward red as more cornsnake is bred into the lines, and more yellow as more emoryi is bred into the lines.

Rootbeer ($ 20-???)
This name has more recently caught on as a name for corn/emoryi crosses that are not expressing any genetic traits. Several other traits, including hypo and motley, have been bred into these intergrades.

Jungle Corn
This name is applied to crosses between cornsnakes and California kingsnakes. Defying a strict definition of hybrids, these are **not** typically sterile. Second generation offspring have been produced from these hybrids. Amel, snow, motley, and other varieties of jungle corns are known to exist.

Coming Attractions

Many claims of "new" morphs are made each year. Almost all of them quickly disappear and are never heard of again.

If a "new" morph is based on a proven genetic trait, it will catch on sooner or later. The name coined by the originator/discoverer will often stick, but sometimes a "better" name will be applied and become more popular.

If a "new" morph is based on a selectively bred variation of an existing morph, it has to pass the market's unofficial "brown bag" test in order to be accepted. The brown bag test works like this: put 25 miscellaneous corns, and 5 corns of this morph, all together in a brown paper bag. Then ask yourself, "Would the average buyer be able to sort through and pick out the 5 individuals of the new morph?" If not, it is unlikely to catch on as a new morph because people won't remember it. In effect, enough people have to believe it is distinctive from existing variations that they will accept it as "new" and use the suggested name, earning it a place in the market and among hobbyists.

Some potential traits are currently being investigated by different breeders, and could prove genetic within the next few years:

- **"T+ Albino"** – This term more or less describes an extreme version of hypomelanism in any species. Current "T+" cornsnakes may or may not be related to other existing hypos.

- **"Paradox Albino"** – This describes an amelanistic cornsnake with some black areas. This should not happen on an amelanistic cornsnake, but it does.

- **"Piebald"** – Also called *pied*, this trait replaces random patches of the snake's normal pattern with solid white. The white areas stand out in stark contrast to the other areas where the usual pattern shows. Such a trait has proven genetic in ball (royal) pythons, and people are always looking for this to occur in cornsnakes. Similar looks are also called "calico." At least two different "potential" individuals are currently being investigated.

Buyer Beware

People are always searching for new traits. This is always exciting, but problems can occur when it is assumed that all unusual appearances are caused by genetic traits. Here are some scenarios:

- An odd hatchling or hatchlings come from normal parents, and a breeder assumes it is a genetic trait. Since the parents don't look like the offspring, it is then assumed that the "genetic" trait is recessive and both parents are hets. The siblings not showing this "trait" are then labeled as "possible het." They are sold at a premium price because they are "possible het" for a new cutting-edge trait.
- An odd specimen is caught in the wild. When the offspring don't show this same oddity, it is assumed that there is a recessive trait at work. Again, the offspring are sold as "hets" for a premium price.
- A breeder has a name applied to a line of selectively bred corns. A buyer or reseller who isn't familiar with the name then sells the individual(s) with the name attached. The next person assumes it is a genetic trait. Offspring of that animal are sold as "hets."

The problem is that the above scenarios are based on the assumption that anything with a name, or anything odd or unusual, is genetic. This is **not** a safe assumption, since many cornsnakes hatch out with odd patterns or colors due to any number of non-genetic causes. Unusual incubation conditions appear to be the most common cause.

In order for a trait to be proven genetic, it must be reproducible in some predictable way. This can take several years from the time the first specimen is discovered. A simple rule to go by is: *if there are not grandchildren expressing the same look, it cannot be assumed to be a simple genetic trait.*

A recessive trait will not appear in the first generation of offspring, but will reappear when the normal-looking offspring are either bred to each other, or back to a parent.

A dominant or codominant trait will appear in the first generation, in either all the offspring, or about half of the offspring. However, selectively bred looks can also affect first generation offspring, so it is necessary to outcross further in order to determine what type of inheritance pattern it follows.

Further Reading / Hyperlinks

A support website for this book is located at **http://cornguide.com.** A message board on the site allows readers to communicate with each other and the author with questions, comments, and feedback about this guide.

Online forums, where you can have a dialogue with other cornsnakers, and browse a huge and ever-growing photo gallery of cornsnakes, are located at: **http://www.cornsnakes.com**

A more in-depth online genetics tutorial can be found at:
http://serpwidgets.com/cornsnakes/genetics/genetics.html

Several handy programs (for Windows) that predict the outcomes of morph breedings exist. Two of them are on the web:
http://mywebpages.comcast.net/spencer62/cornprog.html
http://www.marcelpoots.com/CornWiz/GenWiz.htm

The Corn Snake Manual, by Bill and Kathy Love contains a great deal of information about caring for and breeding cornsnakes, and historical information about the origins of many of the morphs, along with a lot of quality photos. It can be found at many bookstores and reptile shows, or you can order it online directly from the authors at:
http://corn-utopia.com

A web search for cornsnakes will bring up a lot of breeders' sites. Many of them have pictures and information about the morphs they produce and sell. This is a good way to become familiar with the names and looks and varieties. The following websites are a good starting point:
http://serpenco.com
http://cornsnake.NET
http://corn-utopia.com
http://www.vmsherp.com

Morph Listing

This list covers all commonly known morphs to date, along with some up-and-coming developments.

Amber	60-90	Caramel	30-50
Amber (Motley)		Caramel (Motley)	70-100
Amel	20-50	Caramel (Striped)	70-100
Amel (Motley)	30-60	Caramel Diffuse	
Amel (Striped)	60-100	Charcoal	30-60
Amel Diffuse	125-175	Charcoal (Motley)	
Anery	20-40	Charcoal Ghost	60-120
Anery (Motley)	40-70	Creamsicle	25-75
Anery (Striped)	50-80	Crimson	50-100
Anery Caramel		Diffuse	65-90
Anery Charcoal		Diffuse (Motley)	
Anery Diffuse	125-175	Diffuse (Striped)	
Anery Lavender		Ghost	25-60
Aztec	30-60	Ghost (Striped)	130-170
Banded		Ghost Bloodred	
Blizzard	40-80	Hypo	20-50
Bloodred	65-90	Hypo (Motley)	60-120
Butter	50-100	Hypo (Striped)	60-120
Butter (Motley)	150-225	Hypo Diffuse	175-250
Butter (Striped)	1000	Hypo Lavender	150-200
Candycane	50-90	Hypo Lavender Diffuse	

Hypo Pewter		Opal (Motley)	1000
Ice Ghost	150-200	Opal (Striped)	1500
Jungle Corn		Pastel (Ghost)	50-100
Kisatchie	75-100	Pastel (Motley)	50-100
Lava	80-120	Pewter	65-150
Lavender	100-150	Pewter (Motley)	
Lavender (Motley)	1000	Phantom	60-120
Lavender (Striped)	1000	Rootbeer	20+
Lavender Diffuse		Snow	25-45
Miami Phase	25-50	Snow (Coral)	
Miami (Hypo)	50-100	Snow (Motley)	50-80
Miami (Motley)		Snow (Pink/Green)	60-90
Milksnake Phase	50-80	Snow (Striped)	50-90
Motley	30-55	Striped	50-70
Motley/Striped	40-75	Striped Motley	40-75
Normal	10-40	Sunglow	40-60
Okeetee	25-50	Sunglow (Motley)	80-110
Okeetee (Hypo)	30-60	Sunkissed	50-70
Okeetee (Reverse)	40-60	Upper Keys	30-50
Opal	150-200	Zigzag	30-60

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