The Pigeon Genetics Newsletter, News, Views & Comments.

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(Founded by Dr. Willard .F. Hollander)

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This Month : **" When (St) is NOT Almond " .**

By now just about everyone knows that the symbol (St) does not stand for the phenotype term "almond". It stands for the gene **Stipple !** The only way that a bird that expresses the (St) gene can be considered an ALMOND may be when it also expresses tones of red phaeomelanin colour pigment but also with white BREAK in the flights and tail feathers.. When this red pigment combination is affected by the (St) gene it appears as a slightly lighter tone than red and is referred to as Almond colour. That is the colour of the inside of an Almond Nut.

The primary function of the (St) gene is to de-pigment all colour pigments . It does so particularly well when it affects BASE pigments Ash-Red , blue-Black, and brown-Chocolate. It does so by breaking it up into a mix of areas of white Break contrasting against areas of base pigment flecks. However it has only a very minimal affect on the phaeomelanin of recessive red and Kite Bronze and does not actually "BREAK" up those pigments but instead just slightly softens their overall appearance. That is why these reds proved so valuable as components to create 'ground' colour! Breeders realized hundreds of years ago that they could effectively replace the white break in Base pigment by adding in one dose of recessive red , and one or two doses of Kite bronze. They decided to call this replacement of Break the "Ground" colour of the Almond.
So , the (St) phenotype is Base colour plus the white Break. This is called a "Sprinkle" in English. The only time there is an additional colour would be if the Cock birds are carrying a second base colour on the opposite chromosome, in that case the bird will be Flecked in both blue/Black, and brown/Chocolate along with the colourless white break. Ash-Red cocks can carry either blue/Black, or brown/Chocolate. Brown Sprinkle cocks cannot carry any other allele as brown/Chocolate is recessive to both of the other two, so he would have to be simply brown/Chocolate with white break. There is a great deal of misinformation out there on this topic, so I sincerely hope you will read this carefully and realize the logic it presents.

Now, you may wonder why you keep reading or hearing about the terms Classical Almond , Almond , Multi-colour Almond, etc. The answer is quite simple. The Classical Almond phenotype is a man made expression that has been set to a specific standard.

The Multi-colour Almond is basically a "catch all" classification for all those 'almond - ground' phenotypes that do not quite come up to the ideal standard of the Classical Almond. The Multi-

colour class is utilized in Europe and in Particular Germany where they hold very large Pigeon Shows and wanted to accommodate as many exhibitors as possible .

Here is a look at the ideal phenotype for each named classification:

Spread factor Sprinkle (Sprenkle) : A Stipper , but not an Almond. Breeder **Joe Power**

Sprinkle (Sprenkle) - photo of **Adrian Gryz** - Blue/Black sprinkle Stippers with brown/Chocolate linked to the Stipple gene., thus the reversion is to brown/Chocolate. Stippers but not Almonds.

Below-
Classical Almond - Before reversion. with K//K or K//K*B on blue and brown T-Pattern base. The brown base is fourth from the left. Second from the left likely Brander bronze with Kite. Breeder **Octavian Sarofolean**.

Classical Almond - Intense, after reversion begins., Breeder **Rob Grogan**.

Below -
Multi-colour Almonds - These are all considered Stippers because of course they all have the Stipple gene and it mutated to create the Stipple locus.
This bird is a stipper , he has a reddish ground and break in his tail and flights which generally classifies him as an Almond as opposed to a sprinkle . However he lacks the distinct colour contrasts due to considerable "grayish" tones which I suggest are the result of darkening modifiers. This is another Portuguese Tumbler bred by **Joe Power** in his "Sprinkle " Program. He has used Saturated T-Pattern plus Spread factor with the (St) gene. There is a source of red (phaeomelanin) that he believes is Kite that he has been eliminating to create the clear white break eventually. This bird would probably best suit a Multi-colour class if shown. The second bird is genetically the same

except the red does not express much at all. These have been named "Gray" Sprinkles in Europe and are shown as such. Ideally there would be no bronzing or trace hetero recessive red.

You will hear people calling just about anything that is influenced by the "Stipple" gene an "ALMOND"! Of course that is not correct at all. To qualify as an Almond there MUST be an Almond colour 'ground' throughout the birds colour even if it is not ideal in intensity and tone.
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I was very disappointed with a post in the Portuguese Tumbler Group on Facebook which consisted of many incorrect and quite simply ridiculous statements. A portion of it had to do with the term "WELL BROKEN" in reference to the phenotypes of Sprinkles and Almonds . When the word "WELL" is used in the Pigeon world , it is intended to say " **as close to standard Ideal as possible**". There were multiple spelling and grammar errors which further made the comment utter nonsense , but I have written my correction below to allow you a better understanding of the topic that is based upon fact and science. I would have copied the Group article in question so that you could compare them but it was so full of misinformation that I did not want to allow it to be mistakenly taken as something you should read and remember!

Here is my response: "When something is "well rounded", "well stationed" , or "well" anything., it means that it is close to perfection. It is accepted as being close to the desired description by standard. So, in the case of a "Sprinkle" or an Almond phenotype, being "WELL BROKEN" , **it refers to the correct amount of "BREAK" caused by the Stipple gene**. The Bird would normally be either a self Pattern series or a solid spread factor bird. The Stipple gene de-pigments that colouration resulting in white breaks. The Ideal is to have a combination of colour and white as close as possible to **50% Base Pigment, and 50% white break evenly distributed**. That would be a 'well broken Sprinkle'. ---- The almond is quite different in that breeders of old decided that it was possible to create a very attractive bird by filling in the breaks with a "ground colour" of another Pigment , phaeomelanin, as described above.

This produces a bird that should ideally be an 'almond' colour plus black base pigment which should Ideally be 50% base pigment and 50% ground colour almond. Other tones are possible due to the interaction of the components such as heterozygous recessive red, and perhaps others. However the overall objective is to have an "ALMOND SHELL" colour plus base pigment **evenly distributed** over the
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entire bird, with white break appearing ONLY in the tail feathers and the ten flight feathers. This overall colouration would constitute a well broken phenotype. Once the bird advances beyond the age of about five or six , it usually has undergone a reversion to wild type colouration that renders it no longer ideal show quality for colour and thus NOT WELL BROKEN! The tail feathers and flight feathers are usually the first to revert to Saturated T-Pattern Black. Even if this bird was a supreme Champion well broken specimen when it was young, the judge that looks at it now has no way of knowing that it once was ideally coloured so he would have to state that it is not well broken and thus not deserving of a placement in that class!

I was the first person to publish anywhere the reason why "white Break" is only possible in the Tails and flights of a Classical Almond., and how Phaeomelanin can be enhanced in the tail feathers to match the flight feathers. No one else has ever been able to explain these features genetically. I hope all of you will spend more time reading over what I have stated. There is a great deal more in that Post from the Portugese Group that must be dealt with , perhaps I can do that for you in a third edition on the "(St) gene".

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I thought it may help if I incorporated the scientific view of the stipper trait and Position Effect Variegation. (P.E.V.)

The two main issues that have been raised in the past : (1) a couple of people think that the pigmented areas are Break, and they think it is ludicrous for me to say that Break is the white areas. (2) that one person objects to my statement that pigment "resists " the breaking action of Stipper.

If you Google it you will discover : "Through breakage and rejoining , a piece of chromosome normally - less condensed (euchromatin), can be trans-located to the area of - highly condensed (heterochromatin). This often causes "inactivation" or silencing of the normally active genes - this is called Position Effect. This inactivation is often called de-pigmentation , it is the breaking action of the Stipper gene .

The variegation is caused by the production of large clones of progeny cells that have the same neighboring genes condensed into heterochromatin and thereby inactivated . Condensation of DNA into heterochromatin can "skip" over some regions of chromatin - sparing genes that lie within them from repressive effects. No one knows exactly what causes these "skips" , but this is what I mean by "resistance" by the pigmented areas.

When colour is present, there is no BREAK. Break is the inactivated areas that appear white albeit a small portion of a feather , a whole feather, a patch of white feathers or indeed an entirely white bird. The latter is possible on a homozygous Stipper male that appears pure white. He would have break coming from both chromosomes as opposed to just one. The break "may" be complete thus pure white. All base pigment would be inactivated in that case , so we cannot see any.
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Recessive red and bronze do not for some reason break easily so that even the slightest presence of a bronze may be seen. Recessive red almonds (deroys) , express as bronze with darker red flecks where the recessive red masks over the normal base pigment (both red and black) where black was not inactivated. ~ Bob R.

When selecting breeding stock , keep this in mind - "YOU MAKE WHAT YOU USE"! If you breed the best to the best , then you reduce your chances of producing unwanted results. Now we all have heard people say that it does not work that way. Two goods do not guarantee a good. That is true to some extent. The reason is that you cannot be certain at first , if ever, just what is going on in the genetic backgrounds of each bird. Every time you plug in a fault, hidden or otherwise, it will come back to plague your program when least expected. You will hear people speaking or writing about adding this or that to get certain colour effects. Things such as 'dilution' to lighten the ground colour. That MAY make a onetime wonder , but it places that dilution gene into your stock to be carried hidden from that day on. The so called "Almond splash" is another example. It is a faulty coloured bird. It lacks Kite bronze but may express hetero recessive red, so that there is no proper ground. You can get some better young from it by mating it to a bird of good ground being homozygous for Kite and hetero for recessive red. The problem is that you have plugged in that fault only to have it resurface again later. Your chances of producing almond splashes increase every time you use one. Recessive genes are the most troublesome as they are difficult to track since they remain hidden sometimes for generations. Dominant genes are much easier because if they are not visibly present, they simply are not there. That is why you could add your favorite solid black spread factor bird to your Classical Almond breeding program without adding spread factor. You would simply use ONLY the offspring that are not spread so that the **superb type only** of the Spread bird would be added. The pedigree could have a spread bird listed in all four quadrants but spread factor would be absent. That may require more culling than you care to do , but the same applies to adding most all other colour mutations such as dilution, pale, Ecru, reduced, grizzles, etc.

Early breeders even as recent as **Joe Quinn** believed that one or more of the grizzle mutations were beneficial in creating an ideal almond phenotype. The reasoning was that it helped (St) break up the base pigment , and indeed that is true it will, but it will also break the ground and the bird becomes a multi-colour almond that has white where it is not wanted. Keep in mind that Classical grizzle (G) and Print Grizzle affect the base pigment much in the same way as does (St) so the flecks become grizzled.

I have shown these two birds below many times before but they are examples of Almonds that I bred that are without hetero recessive red . The Cock had a classical Grizzle sire but is not Grizzle, I mated him to a spread factor hen and the daughter shown has no spread gene. Each were from a one clutch mating only. Since neither dominant gene, grizzle or spread were present, I knew I could use these to create good Classical Almonds without any concern about those dominants resurfacing later. I did get the Show type of the original Classical Grizzle sire even though the (St) source was from a flying type Roller. Unfortunately I did not get to do further matings to bring in another dose of Kite and a dose of recessive red as I was forced to give up all birds due to lung irritation. I'm happy to say that by giving up the birds my lungs recovered, but sad to say I will never be able to keep any type of birds ever again. I also cannot eat chicken , Turkey , or hens eggs as a result of the allergy.

Getting back to using dilution to lighten the ground. The theory is that when the dilution gene is 'carried', it expresses slightly on the intense coloured bird to help lighten the ground but somehow not the base pigment flecking. However most birds that are shown to us as examples are actually pure dilutes with a sulphur ground. Note that the dark blue flecking is also diluted to Silver. Breeder **Rob Grogan** .

Some that are pale phase instead of dilution phase will be more of a golden tone, but they are more rare. The fact is that the (St) gene alone is sufficient to soften the harsh reddish tone of some classical Almonds. The base "PATTERN" plays a greater role in just how dark your ground will be. It also will determine how even the overall colour tone of your ground will be. There should be no way to tell just by looking at the bird , what pattern is hidden there. In a closely bred family of Classical Almonds , the base pigment and Pattern should be blue/Black Saturated T-Pattern. However breeders do not keep good records and often use birds carrying various open Checker patterns of one form or another and this messes up their ground expression. Photo **Mick Bassett**.

Below are more photos of the Stippers that **Joe Power** has bred from his strain of Portuguese Tumblers.

Looking at these specimens we have to consider that firstly (none are Almonds despite the fact that they owe their phenotypes to the (St) mutation). All are sprinkles at various stages of the expression based upon inheritance of the number of copies of the variant. (CNV). The silvery or smutty tones are due to additional modifiers found in spread factor and Saturated T-Pattern that (St) does not completely de-pigment. The Portuguese Breed is well known for its colours being affected by darkeners. The latter two birds may fool some into believing that they are Qualmonds (St^Q).

The same scenario takes place with various Almond phenotypes and the phenotypes of Hickory (St^H) , and Sandy (St^Sa). It has been further complicated by well know breeders crossing Hickory or Sandy with Various Almonds. They also have put Kite bronze and/or recessive red into established Hickory and Sandy breeding programs . If you see birds that resemble Almonds but that have black, grey, or T-Pattern blue/Black banded tails then you know they are not Almonds. Almonds MUST have white break , black flecking, and almond colour in their tail feathers and flights. Two colours and white.

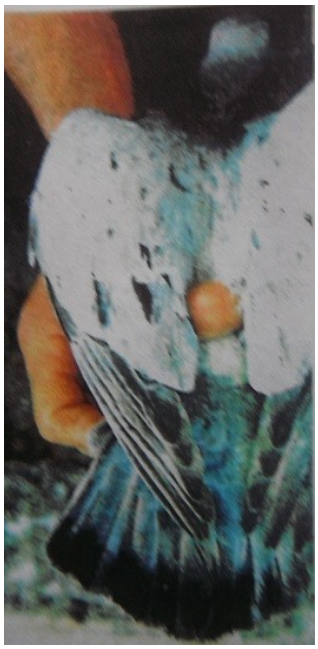
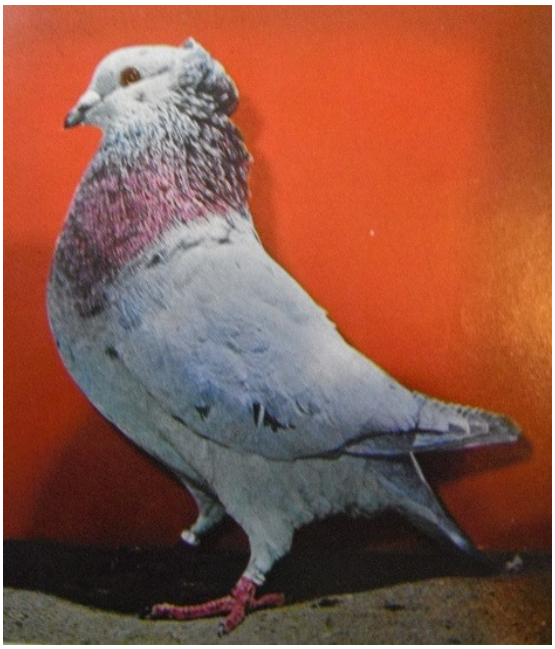
It is extremely rare to see Sandy nowadays and likewise for Hickory mainly due to breeders messing up breeding programs and not keeping records.

Below -
These are Not Almonds , but they are stippers , mutant alleles of the Stipple gene : They are all found at the STIPPLE LOCUS !
"We should point out that we, and I can add **Joe Power** to this, do not like the term 'STIPPER" , it is a rather clumsy application of the English language . Likewise the term 'STIPPLED' . It is based

upon the tense of words for example a person who paints is a Painter, a person who drives is a driver. Therefore a gene that stipples is a Stipper, and a phenotype that is created by the stipple gene IS stippled or has been Stippled. The de-pigmentation of the wild type base is minimal in most of the alleles . With the exception of the mutants "Hickory" , "Sandy" and "White-out" , the following mutations have a very low degree of influence of stippling so that the base flecking shows only with spread factor birds. Wild type birds show an almost normal colouring with just slightly 'grizzled' wing shields in various degrees. In all cases except 'white-out', and dark Hickory, the tail feathers and flights do not have break so that the barred tail is quite normal looking.

Faded -



Qualmond -

blue Checkered.


2nd. photo **Levi** labeled Light almond but appears to be a Qualmond blue Barred.

(All photos with a letter (A), (B) , (C) -- are from **Dr. Paul Gibson's** Book.)

Chalky  blue Barred.

Frosty - 

by **Andreas Lieb** and **Robert Mangele**

Sandy -  Listed in **Levi** as Sandy or 'light Almond'.

Hickory - Blue bar 

Hickory T-Pattern blue/Black. 

Note that the Mutant effects are minimal if at all noticeable on the wild type blue Bar, and increase with more pattern and / or other darkening modifiers. **Wendell Levi** has about two (St) photos correctly labeled in his Encyclopedia of Pigeon Breeds. All others are incorrectly identified simply because no one truly understood the mutations or the terminology used for the phenotypes at this locus back then.

In the new Year , we would like to take an Issue to demonstrate the effect of the various mutations at the (St) Locus in combination with Spread factor. If YOU have photos of any of these combinations that you would like to share with the readership, we would be very grateful if you would send them along to us. Bob_rodgers556@hotmail.com

That is it for the November Issue , Next Month we will feature all of the comments that you have sent in to us . We appreciate hearing from you at any time!

The Stipple gene (St) on a wild type (blue barred) Racer . Photo - **Octavian Sarofolean**.

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The most recent mutant at the (St) Locus was "White Out" and as the name implies it is basically a pure white bird that may have a few coloured flecks usually in the head and neck region. We will try to get more recent photos for an Issue in the New Year, until then Keep well and Keep Busy!
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