

Standard Cockatiel Color Mutations

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Cockatiels have become exceptionally popular partly due to their variety of pleasing color combinations. Some colors are more popular than others and many times beauty is, indeed, "in the eye of the beholder" whether from the bold and flashy attraction of a heavy Pearl-Pied to the more subtle and delicate appeal of a lovely Cinnamon mutation.

The more common varieties and their crosses are listed below and while some may be more difficult to breed than others, each color offers its own unique challenge and beauty.

Normal Grey

The wild cockatiel of Australia, or the nominate race, is grey in color and is referred to as "Normal" or the Normal Grey. The Normal Grey is dominant to all color mutations with the exception of the first new dominant mutation, the Dominant Silver (see separate article on the "New Dominant Silver Mutation of Europe").

Males are primarily grey in color and acquire a yellow face mask upon maturity. All hens and young will display yellow lipochrome pigment spotting on the underside of wing flights and yellow barring on the underside of tail feathers. Both sexes carry the orange ear covert feathers, more popularly referred to as orange "cheek patches" and retain the white wing bar, which should approach three-quarters of an inch and be clear of extraneous colors. The eyes are dark, and both the feet and beak are pigmented.

While the intensity of grey pigment may fluctuate in both intensity in the same individual and in tone between individuals, it is desirable to maintain at least a uniform and even body tone, free of marbling or lighter regions. The variety of color depth between

individual Normal Greys does suggest the possibility of dark factors (e.g. light grey, medium grey, dark grey, etc.) at work although none of the show standards today officially recognize such separate classes.

Pied

The first recessive mutation, Pieds vary in their degree of "wash" creating light, medium, heavy and extra-heavy Pieds, as they are loosely referred to in the Fancy, with no two Pieds being marked exactly alike. In this mutation, a wash of yellow lipochrome pigment and/or white (a lack of pigment) colors the grey areas of the body.

Very light Pieds may only carry tick markings behind the crest or on the nape, *plus* one or more feathers on the rump and possibly one or more wing flights. A common misconception is that a bird with only tick mark-

ings behind the crest/nape area is Pied. Those who routinely breed Pieds find this to be incorrect and that these heavily ticked birds are only "splits" (genetically carry the factor for Pied), and need to be paired to another Pied or split Pied to produce Pieds in the first generation.

Medium marked Pieds carry more Pied "wash" over the back, most flight feathers, some tail feathers and the breast which might be divided by a grey band. A heavy marked Pied will carry a clear face, chest, wing flights and most tail feathers, usually with grey only coloring the area of the upper back. Extra-heavy Pieds may only carry a very small amount of grey about the shoulder or upper back area and those most severe may only sport one or two grey feathers, appearing as a dark-eyed white or Lutino until they show their backs!



Grey Pieds, Grey Pearl-Pieds and Cinnamon-Pearl-Pieds

Photo by Linda S. Rubin

These descriptions serve only as an example and many birds do fall between these informal categories. The NCS Show Standard says of Pies: "The primary factor when judging Pies will be the degree of symmetry and clarity of markings over the actual percentage of Pied wash."

The challenge of breeding good Pies is to retain size while breeding symmetrically-marked birds (i.e. markings on one side of the bird to be the mirror image to the other side). Unfortunately, the heavier the Pied wash, the smaller the overall size of the bird, with males usually being smaller and more heavily marked than the average Pied hen. Depth of grey pigment, being uniform in tone, is also important to any areas lacking wash. While yellow or white Pies seem to be a matter of personal preference (depending upon family line lipochrome production and inheritance), they are still sometimes referred to in the trade unofficially as "Golden Pies" and "Silver Pies", respectively. Hopefully, such terms will fall by the wayside as the rarer Recessive Silvers and Recessive Silver-Pies become more available to the public and the fancy at large.

All Pies have dark eyes and carry the orange cheek patch, and while most have light horn or pink beak and feet, some may carry darker pigment in these areas. Since it is difficult to visually sex Pies (those which retain grey feathers in the tail or flights can sometimes be sexed by searching for barrings or spottings of these areas respectively, on adult hens), some do so by behavior.

Lutino

The first sex-linked mutation, the Lutino is often incorrectly referred to as Albino or White, which adds to the confusion now that a true Albino mutation is available.

The Lutino lacks all grey melanin pigment and appears mostly white, with some individuals carrying yellow lipochrome coloring about the face, breast, tail as well as throughout the body. Again, a yellow or totally white coloration seems to be a matter of the personal preference of the breeder. All Lutinos carry the orange cheek patch, red eyes (which may darken with age if additional melanin shows up in this area later on), pink feet and beak.

The challenge when breeding Lutinos is the complete eradication of the bald spot behind the crest, which

is an inherited feature of this variety. Those individuals which display full feathering behind the crest are rewarded on the show bench and are much sought after as breeding stock from which to build future bloodlines. It is now becoming much more common to see a number of Lutinos at shows which lack the bald spot. Again, this inherited fault can be bred out with proper breeding techniques.

Pearl

Another sex-linked mutation, the Pearl appears as a Normal Grey, with the addition of Pearl "lacings" down the face, neck, back and wings, with lacings being more heavily concentrated at the shoulders. The tail feathers are now yellow with a dark, central "vein" running down the center. It is more desirable to have the Pearl markings extensive, uniform and well-defined, with enough grey for contrast and free from splotching or defects in pattern. Again, individuals vary in their production of yellow lipochrome pigment (dependent upon family lines) and have, in the past, been referred to as "Golden Pearls" (with yellow pigment), or "Silver Pearls" (appearing white), with some a combination of the two! Hopefully, this will not add to the confusion of distinguishing between the rarer Recessive Silver-Pearls.

Unhappily, although they do acquire the yellow face of adulthood, most Pearl males still lose their Pearl lacings upon full maturity and, therefore, closed banding and careful record keeping are essential as, when the males revert back to normal coloration, they will be difficult to distinguish from their Normal Grey counterparts. Those Pearl males which do retain some degree of true Pearl lacings into adulthood are rewarded on the showbench in the hope that eventually all males will retain their markings for life, as do the hens.

As with the other varieties, the orange cheek patch and white wing bar is retained, and the eyes, beak and feet are pigmented.

Cinnamon

A sex-linked mutation which is the first to experience a color modification of the grey pigment, producing a brown tone. The challenge of breeding Cinnamons is to produce birds which carry a more brown shade, lacking any grey overtones, and which is even in depth and tone throughout, lacking evidence of any "marbling" pattern, especially on the

backs of males which is still a common defect among some stock.

While males develop the yellow mask of adulthood, some hens can and often do acquire a fair amount of yellow in their face (compared to their Normal Grey counterparts). Eyes may appear a bit lighter, although they are definitely pigmented, and the orange cheek patch and the white wing bar is retained.

Cross-mutations

According to the NCS Show Standard for Excellence, "Cross or triple mutations will be judged according to each color standard they represent, then as a combination of both (or all) mutations." The breeder is now faced with a much more difficult challenge: he must produce a bird which, in most instances, exhibits one or more colors, and a pattern, within the *same* individual! And, while the color exhibited should be of uniform depth and tone, the mutational pattern must also be extensive and consistent in its markings.

Listed below are some of the more common cross-mutations we see today. All the crosses maintain the orange cheek patch.

Pearl-Pied

Probably one of the more difficult crosses to work with, as one must perfect *two patterns* within the same individual. Although a heavy marked Pied should be the objective, enough grey should be retained to show heavy Pearl lacings down the nape and back, particularly well concentrated about the shoulders. Once again, closed banding is important, as males will lose their Pearl lacings upon full adulthood and be indistinguishable from ordinary Pies!

Cinnamon-Pied

This cross combines a color with a pattern. The objective should be a nice contrast of Pied wash against a Cinnamon brown tone to produce a more subtle Pied. Again, uniform depth of color and tone is important.

Cinnamon-Pearl

Another cross-mutation to combine a color with a pattern. The same aim of maintaining even, uniform color tone with an extensive, well-defined Pearl pattern throughout, should be the goal when working with this variety.

Adult Cinnamon-Pearl males may once again lose their Pearl lacings upon adulthood, and should be closed banded to prevent them from being confused with ordinary Cinnamons.

Cinnamon-Pearl-Pied

This cross combines a color with two patterns and is one of the most difficult to perfect. As with the above combinations, the depth and tone of the Cinnamon color should be maintained against the overall Pied wash with enough area to allow for a heavy and extensive Pearl lacing over the back and shoulders, and possibly other areas. This can be an extremely colorful mutation and has been a favorite among breeders.

Again, closed banding and record keeping are important, as adult males lose their Pearl lacings upon maturity and can appear as ordinary Cinnamon-Pieds later on.

Lutino-Pearl

One of the earliest cross-mutations, this variety combines a color with a pattern. The objective should be to produce individuals which lack a bald spot while exhibiting extensive and well developed, golden Pearl lacings over the nape, back and wings, being well concentrated at the shoulders. The Lutino-Pearl will display red eyes, although they can darken up slightly should additional pigment color them later on.

Again, adult males can revert to the appearance of ordinary Lutinos upon maturity should they lose their Pearl lacings, so closed banding and accurate record keeping is a must.

Lutino-Pied

A less popular, but well-loved color among those who work with it. This cross technically combines a color with a pattern, however, it appears that the aim is to improve only the color in that a well marked Lutino-Pied can appear almost entirely yellow! This, however, is dependent upon background lipochrome production in the family line of Pieds being worked with. The distinguishing feature of this variety is that, unlike many ordinary Lutinos, the eyes of the Lutino-Pied remain ruby red throughout its life! Most breeders prefer this cross for the heavy yellow cast it generates, sometimes appearing just as dark, and much more continuous, than the Lutino-Pearl. Again, eradication of the bald spot with this variety is important.

Lutino-Pearl-Pied

This variety combines one color with two patterns and can be outstanding! A heavy Lutino-Pearl-Pied can appear a very rich yellow, again depending upon background bloodlines. An ideal Lutino-Pearl-Pied will

be of a more solid yellow color and reveal deeper individual yellow lacings on the back, shoulders, mantle, nape and head. Once again, this variety should maintain ruby red eyes throughout life. And, males can lose their Pearl lacings and revert to appearing as Lutino-Pieds, which, depending upon the lipochrome production, may retain the degree of yellow corresponding to the Pied wash they contain.

Author's note: readers of this arti-

cle should understand that crossing any of the above colors to one another *does not necessarily* produce the combined mutations! This article is intended merely to describe these combinations and is not intended to instruct readers on which birds to pair for these results.

References

- Rubin, Linda, S., *The Complete Guide to Cockatiel Color Mutations*, Chapters 1-4, 6, 7 and 8. Newton, MA. ©1988.
Rubin, Linda S., "NCS Show Standard of Excellence." National Cockatiel Society. 1984. ●

Breeding Expectations for Recessive Mutations

(To compute only one recessive color at a time)

Normal Grey X Normal Grey/Recessive	=	50% Normal Grey 50% Normal Grey/Recessive
Normal Grey X Recessive	=	100% Normal Grey/Recessive
Normal Grey/Recessive X Normal Grey/Recessive*	=	25% Normal Grey 50% Normal Grey/Recessive 25% Recessive
Normal Grey/Recessive X Recessive	=	50% Normal Grey/Recessive 50% Recessive
Recessive X Recessive	=	100% Recessive

KEY:

/ denotes heterozygous or "split to"

* This "split to split" pairing is known as a 1 2 1 ratio (i.e. 25% homozygous Normal, 50% heterozygous or split, and 25% homozygous mutant).

Breeding Expectations for Sex-Linked Mutations

(To compute only one sex-linked color at a time)

(NOTE: A female can NEVER be split to a sex-linked mutation!)

Sex-linked cock X sex-linked hen	=	100% sex-linked young
Sex-linked cock X non-sex-linked hen	=	50% split sex-linked cocks 50% sex-linked hens
Non-sex-linked cock X sex-linked hen	=	50% split sex-linked cocks 50% non sex-linked hens
Split sex-linked cocks X sex-linked hens	=	25% split sex-linked cocks 25% sex-linked cocks 25% sex-linked hens 25% non-sex-linked hens
Split sex-linked cocks X non-sex-linked hens	=	25% split sex-linked cocks 25% non-sex-linked cocks 25% sex-linked hens 25% non-sex-linked hens