<u>COMBS</u> FOR THE CONNOISSEUR DLZX

When you start mixing varieties for your project, strange things can happen you cannot easily explain. Especially a cross between single comb x rose comb can amaze you with the variety of comb shapes it can produce. Some look even like duplex combs!

Al rendering: freak comb cock.

What did Taylor do that no self-respecting geneticist ever wanted to burn their hands on?

Well he crossed a cock named L160 from a Plymouth Rock father x F1 mother (daughter of Plymouth Rock father x Hamburg mother). He mated cock L160 to three F1 hens (Hamburg father x Rock mother), one F2 (Hamburg dad x Rock mum) and one hen from F1 same as before father x rock hen.

The combs of the hens above were four with an impure (heterozygous) rose comb and one had a single comb with sidesprigs.

Cock L160 had a true single comb without defects although he came from a nest of which two of his sibs had sidesprigs and the other ten had had normal single combs like he had.

The cross from cock L160 to the above mentioned hens resulted in unusual combs in offspring. They ranged from sidesprigged single combs to duplex combs looking like poorly shaped buttercup comb to a comb with three rows which could be easily mistaken for a pea comb when casually looking.

Taylor called these strange comb shapes, and even more complex ones: multiplex combs. We only know multiplex as construction wood, however...

He also distinguished different types of multiplex combs: Duplex comb: looks a bit like buttercup only more rock and roll.

Single-triplex = on the front Single and triplex = three rows or serrations, on the backside. Duplex-triplex looks like a weakly single-triplex. Duplex-quadruplex = a nightmare'ish buttercup in mental rock and roll state.

TEXT & PHOTOS: SIGRID VAN DORT WWW.CHICKENCOLOURS.COM **MATERIALS: TAYLOR 1946**

He then crossed a triplexcombed male (looks bit like three row pea comb) to a heterozygous rose comb hen, to a full sister and two half-sisters all with triplex combs and to two heterozygous rose comb Hamburg hens from the original crossbred group.

Of all the resulting rose comb hens, 23 were rose and 21 nonrose. Of the ones with a rose comb 14 showed instead of a normal single spike at the end (like Hamburg) bifid or trifid spikes.

This might come from the multiplex condition which had a low expression in rose combs and a more strong expression in non-rose combs.

The non-rose combs that came from the cock and his mum, two had a sidesprigged single or duplex comb and three had duplex-triplex combs. The Hamburg partners of this male gave 3 single, 6 sidesprigged single or duplex combs, 5 single-triplex, 14 duplex-triplex and one duplexquaruplex as non-rose comb types.

The triplex x triplex mating gave one single, six sidesprigged dingle or duplex combs, 8 single-triplex, 6 duplex-triplex and no rose combs.

TABLE 1.—Frequency of multiplex comb types in offspring produced during six years of selection

Comb Types-classified with regard to greatest complexity

Year	Number of birds	Single	Single Sidesprigged Single or Duplex		Quadruplex	Quintuplex	
		%	%	%	%	%	
1940* (all matings)	30	46.7	23.3	30.0	0.0	0.0	
1940* (only matings pro- ducing multiplex)	21	23.8	33.3	42.9	0.0	0.0	
1941*	50	8.0	24.0	66.0	2.0	0.0	
1942	39	10.3	28.2	48.7	12.8	0.0	
1943	52	0.0	1.9	42.3	55.8	0.0	
1944	40	0.0	0.0	32.5	60.0	7.5	
1945	66	0.0	0.0	22.7	74.3	3.0	

* Based on total of non-rose offspring only.

It appeard that the triplex combed cock was genetically non-rose comb and he gave the same proportion of non-rose comb kids in matings with heterozygous rose comb hens as would be expected from single x heterozygous rose comb.

Are you going crazy yet?

Taylor not. He continued in 1941 trying to create a fixed and intensified super complicated multiplex comb. He hatched his first duplex-quadruplex the same year. in 1944 and '45 he had a couple of duplex-quintuplex (5 serrations) and mostly they were males.

He didn't hatch a rose combed since 1941. He proves with this, according to himself, that multiplex combs are no rose combs. He made a table of the results after 6 years of crossing for tentacle combs.

See table 1, top of this page.

Taylor performed a backcross from his freak comb x single comb

In 1945 all female F1 with all sorts of freak combs were crossed to a single-comb White Leghorn of a family without recent history of sidesprigs. The results of a back-cross of this mating x single you find in table 2.

The parents are mentioned in the left column, kid's combs under F1 individuals.

See table 2, bottom of this page.

Although from the multiplex combs x single comb a few single combed were born, means that they are not 'normal' single combs although they phenotypically were. This is proven by the other comb types, some freak combs too, they produced.

Okay and then Taylor crosse the F1 from table 2 x a single comb White Leghorn cock again. The results you find in table 2 mind you: F1 hens had all sorts of strange combs but also were heterozygous for single comb, regardless phenotype.

See table 3, bottom of this page.

Even a cross to single comb, of single, sidesprigged single and duplex combs, gave complex combs. Did the single combed Leghorn add complexity too??? Or is the complexity not always popping?

Asmundson (1926) and sidesprigs

Genes for sidesprigs play a role in multiplex combs although Asmundson said: it is not 1 gene, there are several factors contributing to sidesprigs, maybe complementary action for two genes. Read: 'maybe'. Taylor thinks there is also complementary action



happening in multiplex combs. He thinks it might be possible that simple sidesprigs are the weak expression of genes that need other factors to go mental and give freak combs. Given the occurence of multiplex combs in the F1 of single x multiplex it might be that even the purest single combed possess factors that contribute to multiplex combs. He thinks he did not get the most complex multiplex combs possible yet, nothing is known further of this test breeding and if he could manage to get pure breeding freak combs.

Fake pea comb

Taylor mentions an abstract of Alder (1941) in which Alder selected from single combed sidesprigged birds, chickens with phenotypical pea combs. By mating sidesprigged individuals the sidesprigs became larger and more and eventually '...with ridges on each side of the base of the single comb, each ridge with four to five points'. This was interpreted as change from single to pea comb by selection. Taylor's triplex combs could easily be mistaken for pea combs, the lateral ridges of the real pea comb are smaller and lower than the median ridge, and

TABLE 3.—Results of backcrossing F₁ Q Q possessing various comb phenotypes to a Single Comb White Leghorn male

		Combs in	Percentage			
F1 Dam's phenotype	Single	Side- sprigged single or duplex	Single- triplex	Duplex- triplex	Single	Triplex
Single	30	4	1		85.7	2.9
Sidesprigged or Duplex	13	3	4	2	59.1	27.3
Single-duplex-single-triplex	6	2	3	1.	50.0	33.3
Duplex-single-triplex	7	4	1	3	46.7	26.7
Single-triplex	15	5	6	·	57.7	23.1
Duplex-triplex	14	8	7	5	41.2	35.3
Duplex-quadruplex	7	6	4	2	36.8	31.6
From all backcrosses	92	32	26	13	56.4	23.9
From all multiplex dams	62	28	25	13	48.4	29.7
From triplex and quadruplex dams	49	25	21	11	46.2	30.2

 TABLE 2.—Comb types in offspring from reciprocal multiplex×Single

 Comb White Leghorn matings

	Combs in F ₁ individuals						
Mating	Single	Side- sprigged single or duplex	Single- triplex	Duplex- triplex	Single quad- ruplex	Duplex- quad- ruplex	
Duplex-quadruplex d'd'×single 9 9	3	9	6	6	1	2	
Single-quadruplex & Xsingle Q Q	18	5	10	4			
Duplex-triplex of X single 9 9	2	10	8	8	1	1	
Single of X Duplex-quadruplex 9 9	—	_	4				
Single of XDuplex-triplex 9 9	3	5	7	2		-	
Total	26	29	35	20	2	3	
Percentage	22.6	25.2	47.8 4.4		.4		

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Sidesprig on single comb. Photos: Bert Driessen (B).

the serrations on the later ridges fail to equal the height of the serrations of the middle ridge. All ridges of the triplex comb were more complicated types of a multiplex comb with the horizontal plane app. the same height. The real pea comb was already proven to be a single autosomal gene incompletely dominant to single comb. Together with rose comb (Punnett, 1923) it gave walnut

combed chickens.

Taylors birs, heterozygous rose x triplex, never gave walnut comb types, so there was no pea comb at all. Since Taylor and Alder created multiplex combs from sidesprigged single comb stock, it was clear that pea combs cannot be derived from single combs either. Remember this is the 1940s.

Taylor finally argues that a true breeding strain of chickens with multiplex combs, is fundamentally a modification of the single comb. Although his chickens are not homozygous for all genes for the production of multiplex types of combs, the phenotypic multiplex rock and roll mental freak comb can be bred.

Multiple factors, some complementary action and with the same action as sidesprigs, are involved in this weirdo comb type.

It is certain, however, that the triplex combs looking like pea combs, are not true pea combs.

What can we learn from this endeavour?

A tip based on Taylor's research, after single x rose you can best only continue with the rose comb and forget about the single comb. Don't do this at home: use a rose combed breed into your single combed birds if you want to keep single comb in the future or prepare for some sidesprigs now and then.

Anyone wondering about occasional sidesprigs in single combed Orpington, Dorking, Rhode Island Red, Minorca, and who knows what more breeds having both a single and a rose comb variety?

I have also seen many comb appearances described by Taylor and it made me seriously doubt the origin of the parent birds. Did I mis-see a duplex comb in them? Were they hiding stuff? I saw from single x rose comb heterozygous duplex combs, which is was possible. Now we

know it is possible, thanks to Taylors freak combs.

Taylor's 1946 photo material is poor, see page 5.





Cross single x rose comb. "Duplex-triplex'ish"

Cross single x rose comb. "Multiplex"



To compare: Cross: P single x walnut F1 x F1 = this F2 looks like *P*/*p*+ *R*/*r*+, heterozygous pea comb, heterozygous rose comb, sort of 3 horns on end of comb due







FIG. 1. Types of multiplex combs: 9 T1669, duplex; 9 T1673, single-triplex; 9 T1665, duplex-triplex;

D126 & weakly developed single-triplex; D144 & and V170 , duplex-quadruplex.

Something came to mind reading Taylors paper. That is: there are several different rose combs. Think of the smooth Wyandotte rose comb as opposed to the very serrated Derbyshire Redcap on the right here.

And then speaking of the leader of the Hamburg comb, it is different from the one on the Wyandotte, plus the many leaders on the end of the Redcap comb. Do you see the 'split' on the front of the Hamburg rosecomb? You can see this in unbearded Silkies too where the comb 'hangs' sort of over the nose on both sides.

Anyways, nobody followed Taylor up in crossing single x rose comb for the most freakish combs on earth.

More on combs: My book: Genetics of the chicken Extremes on the website see link below.



Abvoe: A Redcap with lots of serrations or tentacles on the comb, it is a rose comb just like the Hambrug comb, with several leaders or end spikes.

Below a Hamburg. Both birds photograped in the UK.

SHORT STORY 1946 Taylor Multiplex combs

A SERIES of peculiar comb types was observed in the offspring of a crossbred male L160 [Columbian Rock $3 \times F1 \$ (Columbian Rock $3 \times Hamburg \$)] produced in 1940. This male was mated to three females from F1 3 (Hamburg $3 \times Columbian$ Rock $\$)×Hamburg $\$ $\$ matings, one F2 $\$ (Hamburg $3 \times Columbian$ Rock $\$) and one female from a F1 3(Hamburg $3 \times Columbian$ Rock $\$ mating.

Male L160 possessed a true single comb without defects, but he was derived from a mating which produced two sidesprigged individuals in ten single-combed sibs.

Of the females mated to L160, four were rose-combed (heterozygous) and one had a sidesprigged single comb.

The unusual comb types in the offspring ranged from sidesprigged single combs, through duplex types resembling in best developed forms a small, poorly shaped Buttercup comb, to a triplex type which might easily have been mistaken for a pea comb on casual inspection.