

Adult pair, Red-headed Gouldians

Success With Gouldians

by Rae V. Anderson

Gouldian Finches (*Poephila gouldiae*) are without question the most dazzling of all the finches and are among the top contenders for this honor in the entire bird world. They are quiet, non-aggressive, relatively confiding and inactive bird.

Color Variation

They appear in three primary colour variations, black-head, red-head, and yellow-head. In all three of these cases all of the colours are the same with the exception of the head. The black-headed variety is by far the most abundant in the wild state. Occasionally red-headed specimens will be seen in wild flocks of black-headed birds. The yellow-headed variety is very rare in the wild state. In the case of the yellow-headed variety the colour most often seen is a rich burnt orange or copper. These so-called yellow (orange)-heads are now reasonably well established in aviaries and in some countries sell for less than the red-heads. The birds with a light butter yellow head are rare indeed and do not yet seem to be established in aviaries.

To my knowledge there are six other color variations of the Gouldian finch. These are the albino, lutino, blue-backed, dilute-backed, white-breasted and blue-breasted. The albino and lutino are true color varieties. The blue-backed, having otherwise normal color, apparently is not a pure mutation because the blue appears in varying degrees and may appear and disappear with successive moults. Also the blue-backs do not breed true to color; i.e., a pair of blue-backed birds produce mostly green offspring. All of these mutations are still very scarce.

In the lutinistic mutation of the red and yellow-headed Gouldian the purple breast appears white, the back yellow instead of the normal green, and the head

remains a red or yellow which is similar to that in the normal bird. In the case of the lutino form of the black-headed variety the head appears white. Obviously the lutino of the red-head is the most attractive of this mutation and that of the black-head is quite plain.

The albino form is all white except for the red or yellow head which remains close to its normal color. In the albino form of the black-head, the black pigmentation is lost, so the bird is pure white. Needless to say, this seems like a waste of beauty.

The blue-backed form is normal in all respects except that the green of the back is replaced by a rich greenish-blue. This blue coverage occurs in all degrees, from a spot to complete.

The dilute-backed form is another in which all color is normal except that the green of the back is replaced by olive or cinnamon.

The white-breasted again is a form with completely normal coloring except that the purple of the breast is totally lost, being replaced with snow white. In the blue-breasted variety the purple of the breast is replaced with blue.

Some of these mutations are quite interesting and the lutinos are very pretty but none are really as attractive as the normally colored birds.

The female Gouldian has all of the colors of the male but they are not as brilliant and are less sharply defined.

Birds of each of the three head colors will breed true to color if they are pure. Red-headedness is sex linked and dominant to both black-headedness and yellow-headedness. Black-headedness is sex linked and recessive to red-headedness but is dominant to yellow-headedness. Yellow-headedness is a simple recessive factor to both red-headedness and black-headedness.

Continued on next page

Red-headed males may be pure, split to black-headedness or split to yellow-headedness. Red-headed females cannot be split to black-headedness, but may be split to yellow-headedness. Neither black-headed males nor females can be split to red-headedness but they can both be split to yellow-headedness. Neither yellow-headed males nor females can be split to either red or black-headedness.

The yellow-headed color is not a true color variety, but rather is actually either a red-headed or black-headed bird with a gene defect. This defect makes them physiologically unable to change the yellow carotinoids of their food into the red carotinoids which are deposited as the red color in the feathers and the tip of the bill. This causes the unchanged yellow carotinoids to be deposited instead. The nature of this hereditary yellow-headedness was proven by Professor O. Volker of the University of Giessen, Germany.

Immature Gouldians are very unimpressive little birds, olive green above and beige below. Immature head and breast feathers that are occasionally lost are soon replaced with adult plumage color making these individuals rather easy to sex before they have gone through their adult moult. The young birds moult at the same time as the adults and go through the complete change to adult plumage unless they leave the nest within a couple of months before this moult, under which circumstances they may only moult to partial adult plumage. They will then stay in this half juvenile condition until the following year.

Habitat

Gouldians are native to Australia and range through tropical northern Australia from northern Queensland to north Western Australia. They seem to prefer open grassy areas whether arid or near water courses. They feed on the seeds of various grasses usually on or near the ground. In the arid country they are frequently found long distances from water which they only visit at dusk to drink.

The song of the male Gouldian is quite weak, squeaky, and unimpressive. You must be fairly close to the bird or else in a very quiet location in order to hear it at all.

Selection and Acclimation

Gouldian finches are EASY to raise! They are not delicate! There is no need to lose them!

There are, however, too few Gouldians. I am presenting here all that I have learned about them that will contribute to improved breeding, reduced juvenile mortality, and increased mortality due to old age. Mr. K.C. Lint, Curator of Birds for

the San Diego Zoological Society is responsible for convincing me that I should share my Gouldian success. Mr. Lint estimates that several hundred Gouldians die each year here in Southern California alone simply because their owners are not familiar with their needs. Also many people no doubt give up aviculture due to the discouragement that they encounter from monetary as well as aesthetic losses when their Gouldians die for "no apparent reason". Here is the story.

First, be careful which birds you buy. Some stock is definitely better than others. I have never had appreciable success, nor have I known at first hand of any with Japanese raised birds. In the United States, prior to quarantine regulations, they are usually considerably less expensive than those that are locally raised. Of course I know that some of them are rearing young but the results are usually quite limited. The poor success generally realized from these birds may be due to the methods of breeding generally used in Japan. Pairs of Gouldians are placed in batteries of small box cages wired in the front only and which are stacked indoors from floor to ceiling. Each cage contains one pair of birds and is equipped with feed and water containers, perches, and a woven straw nest. The eggs laid by the Gouldians are harvested daily and placed under society finches to be fostered. One Japanese breeder told me that in this manner he has gotten up to 70 eggs from one hen in one season. The staple seed of these Japanese Gouldians is barnyard millet, screenings from rice which contain small weed seeds and some greens. When young are in the Society finch nests hulled small millet which has been mixed with raw egg yolk and then dried is provided as a nestling food. This is made available to the young birds until they are well on regular seed. Being raised in this manner it would hardly seem reasonable to expect anything but birds that are weakened or had lost their ability to breed. Of course the first young raised from each pair would be kept for future breeding stock. These first few should be reasonably good strong birds. Being mainly indoor raised and in small cages, they should be more difficult to acclimate to outdoor aviaries than were the wild caught birds that used to be available.

Even though I live in Southern California quite close to our border with Mexico, we are in a valley and far enough inland to have fairly substantial extremes in temperature. Winter temperatures this year have dropped to 16°F (-9°C) on successive nights. In every case, however,

the temperature here rose again by noon to above freezing. In a flock of well over 100, not one Gouldian has been lost during these cold spells. Large water dishes were completely frozen and supplemental water had to be put in the cages each morning until the weather warmed. In summer the majority of our days are in the 90^osF with a few to 105^oF and an occasional 115^oF. I have not yet lost a Gouldian during or shortly after these extremes.

My aviaries are largely open, 4 to 6 feet of the top being covered at each end. The back is covered from roof to the ground. Four feet of the side adjacent to the back of the cages at the extreme ends of the battery of aviaries is also covered. The shelter is actually part of the flight with no doors, partitions or curtains of any kind to close it off or separate it from the flight. Otherwise sides and top are aviary wire with no other protection. I offer them only enough protection to keep the rain and dew off them if they elect to use the shelter and to prevent the wind from blasting completely unimpeded through the shelter area. Although these birds are hardy, I am not at all sure that they would survive temperatures near 0^oF without some form of additional protection. You can, however, make hothouse creatures of them by pampering.

They are not delicate. Certainly if you get newly imported birds and put them into unheated outdoor aviaries in the late fall or winter, you will probably lose them. However if you get locally raised birds or stock that has already been acclimated (birds that have for a couple of months been in outdoor aviaries with temperature conditions similar to those in your aviaries), you should have little or no trouble. The most ideal is to obtain the birds and put them into your aviaries in late spring or early summer unless you know that they are adequately acclimated. This way they acclimate themselves automatically as the seasonal temperature changes progress.

Most species of birds readily adapt themselves to the change in seasons when they are shifted from one hemisphere to the other. However the Gouldians are much more reluctant to make this change and unless forced to do so will attempt to breed through our late fall and winter which are the months of their natural spring and summer. This tendency is not even lost in birds that have been raised in the northern hemisphere for ten generations.

The advantages of summer breeding are great enough that this transition should be forced. This can be done by

simply removing all nest boxes and nesting materials in October or November (earlier in extremely cold areas) as well as separating the sexes if space permits. I will cover the reasons for this a little further in the article.

It has been my experience that only about 50% of the first year birds will breed. If this same thing is experienced even with older birds, it can be nearly completely overcome by two means. This problem is usually not experienced where there is a single pair with no other Gouldians around. The hens do not always agree with your choice of their mates. I can usually get 100% breeding in birds 2 years old or more by letting the hen choose her own mate. She seems much more satisfied this way. This hits rather close to home, doesn't it? It is easy to do but requires a few extra cock birds. After the birds have completed their moult simply put one hen and 3 or 4 males, each with a plastic leg band of a different color, in the desired breeding flight cage. Within a week or 10 days (and sometimes the first day) you should see the hen accepting the display of one cock bird (simply by permitting him to dance and sing close to her) while she will peck at or fly away from the other males as they display. You have then usually found a compatible pair. Simply remove all males except the one the hen has accepted. These other males can then, of course, be presented to another hen. One compatible pair of these birds in a cage will usually raise as many young as will four to six pairs that are all sharing the same cage. They simply breed better when they do not have company of their own kind.

Your Gouldian hens are in breeding condition when their beaks become dark blackish grey instead of the usual shell color.

Nesting

These birds seem to prefer a closed type nest like a gourd or nest box. While they like dried gourds, these have the disadvantage of being difficult to clean between nestings. If the top portion is cut off the gourd and then hinged to facilitate inspection and cleaning when necessary, they are fine and the birds like to use them.

I personally prefer to use conventional finch type nest boxes. Inside dimensions forming a 4 or 5 inch cube with top is just right. The nest opening should be a 1½ to 2 inch diameter hole placed at approximately the center of one of the vertical sides. There should be a small perch or platform below the entrance where the adults can alight before entering or inspecting the nest. A projection of

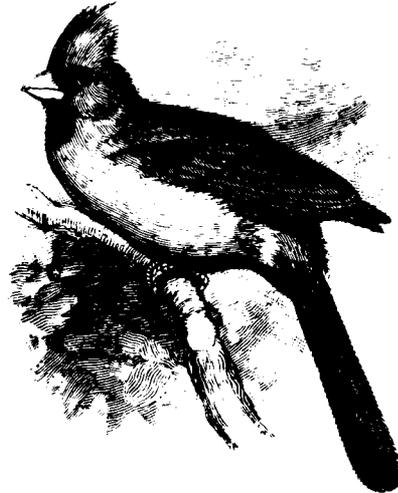
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the board which forms the bottom is fine.

While some male Gouldians will not build nests for their mates and some of these hens will lay their eggs directly on the wooden bottom of the nest box, others will build a complete dome type nest from long pieces of grass and line the bottom with short ($\frac{1}{2}$ to 1 inch) pieces. This laziness on the part of some of these birds may be the result of many generations in captivity or simply of unnatural type nesting facilities.

In the wild state they build a bottle-shaped nest of dry grass in tall grasses, bushes, tress or hollow limbs of trees. I have, however, never been able to entice my aviary Gouldians to build in a bush when nest boxes were available.

After removing all normal nesting facilities I have had individuals who did not think they were finished with their homemaking, excavate an area of sand beneath a piece of wood that had been laying on the floor of the aviary and with no other nesting material proceed to lay, hatch, and raise young. The hens, while they were on these nests, were completely hidden from view.

As with all finches, you should never provide strong fine fibres such as string, thread, nylon, etc., for nesting material. These will frequently tangle around the feet of the babies and as they grow the blood circulation is cut off and their feet develop in a deformed manner.

My experience is that Gouldians are

very tolerant of interference (inspection) with their first nest each season. After the first nest it is risky to inspect unless you suspect trouble. While some pairs will not apparently object to you doing this, others will either abandon theirs or carry the babies out and drop them on the aviary floor. It is best to minimize interference.

Once out of the nest the young Gouldians will seldom re-enter even to sleep. The only exception to this that I am aware of is their curious inspection of nest boxes. They do not however stay in them for any length of time.

Young Gouldians are independent of their parents surprisingly early. While they will still beg to be fed, it is perfectly safe to remove them from the parents ten days after they leave the nest. At this age they are quite capable of eating by themselves and you should not have any fear of losing them.

The parents will usually start their next clutch of eggs within two or three weeks after the babies leave the nest.

The young birds are very curious and if not removed from the breeding cages will interfere with further nesting of the parents by going in and out of the nests or by continually sticking their heads in the nests to see what is going on inside. Adult hens also have a bad habit of being nosey. They are frequently more interested in what is going on in the cage next door than in their own home. In some ways they seem almost human.

Nest boxes should be removed, and it is desirable, but not necessary, to separate the sexes after nesting, preferably in October or November in the Northern hemisphere depending on the locality and temperature. Gouldians appear to complete their moult earlier and go to nest quicker after the moult if the sexes have been separated through the winter. This separation serves four purposes.

1. Prevents young from being hatched when the days are short and nights cold. Winter breeding means less food to the babies because the days are so much shorter than in summer. There is some speculation that Gouldians feed their young by regurgitation through the night during the first week or so after hatching. I cannot confirm or deny this. However my fairly close observation of a reasonably large flock has never given me any reason to believe that they do feed at night. Anyway the adult birds frequently stop brooding the young at night when they are from one to two weeks old. Cold winter nights are obviously likely to result in dead babies. Winter raised babies usually take a few days longer to leave the nest than those hatched in summer.

2. Forces the hens to take a rest from the rigors of raising families and permits both sexes to build themselves up in preparation for the 100% moult which they undergo in approximately April and May. This in itself will reduce losses in your birds.

3. Previous years breeders will go back to nest amazingly soon after being reunited. You should of course put the same pairs back together that bred for you last year. They will appear to recognize each other and be anxious to set up housekeeping again. It should not be unusual to have the seasons first young out of the nest in late June or early July.

4. Prevents egg binding that you will otherwise experience in some of your birds in the cold weather. Gouldians, if permitted, will frequently nest from October through March. This of course retards the moult, puts the birds into the moult in a weakened condition, and reduces the chances of summer breeding for that year.

I do not attempt to achieve any breeding records. To the contrary, I do not permit any pair of birds to raise more than three clutches of young in a season. Also I consider 3 to 5 young in a nest as ideal. More than 5 creates an excessive burden on the parents or else the young do not get as much to eat as they should.

Aviary Accommodations

One of the most important factors to breeding success (if one can be classed as more important than another) is that these birds should not be crowded. A minimum sized outdoor aviary that will produce good results is 6 feet long, 2 feet wide, and 6 feet high. In a cage this size there should not be more than one pair of birds. In a larger cage, for example, 12 feet long, 4 feet wide, and 6 feet high, a maximum of 3 or 4 pairs of compatible birds will breed very successfully. The best result will be obtained, however, if each of the pairs in the one cage is of a different specie. Birds that are stronger and more aggressive than the Gouldians frequently cause interference with the Gouldian breeding. This includes birds such as Shaft-tails, Diamond Sparrows, Parsons, etc. You can only be certain that the small weak species will not interfere.

Be certain to have adequate nest boxes. Two boxes per pair of birds is desirable, or at least a surplus, otherwise squabbling is likely to result over a particular box. There also appears to be a favorable psychological factor where the birds can take a choice of nests. Both male and female share in incubating the eggs and feeding the young.

Natural branches and twigs of varying

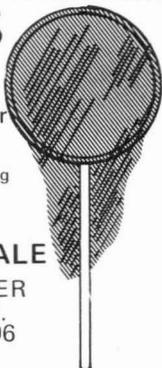
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diameters but generally smaller than a lead pencil are preferred as perches. They are more resilient than dowling or other man made perches and provide the birds with changes in foot posture.

Reducing Losses

For most of the years that I have kept Gouldians I had post-mortem examinations or autopsies made of every one that died. In the largest percentage of cases these examinations showed "no conclusive cause of death". This of course is the Gouldian story with which all too many of us are familiar. A portion of the reports showed cranial hemorrhage which had resulted from the bird being hit with a net when being caught or else having been frightened at night by a cat, owl, opossum, etc., on the aviary, and consequently hit their heads against the perches or ends of the aviary. Some showed extreme constipation. There were also some cases of egg binding. In a few instances there were possible contributing conditions such as an enlarged spleen, etc.

I will not deal here with the accidents. The cat and owl problem is not unique to the Gouldians and has to be met regardless of the type of aviary inmates (unless of course you keep ostriches, etc., instead of the usual small species).

Sometimes the Gouldians will look "dumpy" and consequently give some indication of distress. These birds can usually be saved with antibiotics and heat or with the conventional methods of dealing with egg binding.

Let's first clear out the easy problems.

1. Egg Binding. This can be prevented by not permitting the birds to nest in the winter months when the night temperatures are low. The incident of egg binding is normally much higher in cold weather than in warm. However, if a hen appears "dumpy", feathers fluffed up, squats with legs more than normally separated and abdomen on or near the perch, and flight labored, it is a pretty good guess that she is egg bound. When you feel her pelvic area to determine if she is carrying an egg you must be extremely careful. Too much pressure from your finger will break the egg. Touch her just firmly enough to feel if the "hard lump" (the egg) is there. If so insert a drop of warm mineral oil into the vent or cloaca with an eye dropper. This will help lubricate the lower portion of the oviduct and then if the bird is kept warm, preferably 90 to 100°F, the egg should be discharged within 24 hours. Heat is the most important item in this cure. The longer the hen is left before treatment is started the weaker she becomes and the more likely you are to lose her. Without treatment

she will usually be dead within three to four days after you notice her distress.

It is always risky to net adult hens when they are likely to be laying because if an egg is broken in the oviduct, peritonitis from the "foreign matter" is likely to develop and the hen will surely die. Of course, as with any birds that have suffered egg binding it is desirable to keep that hen separated from the males for at least 3 or 4 months if possible. Otherwise she is likely to have a similar recurrence in a very short time.

2. Constipation. This problem can pretty well be eliminated by keeping a small container of Epsom Salt (magnesium sulphate) crystals or grains available in the aviary at all times. The birds will use it in small quantities when needed. Do not however make this available for psittacines. They over indulge with drastic gastric effects.

3. No conclusive cause of death. This of course is the one we all want answered. It appeared to me for many years that this was most likely a dietary problem since the death of my birds did not seem to have any relation to temperature or weather.

Many things seemed to help. I will present them here. Of the many things I provide there is no "one" that performs the miracle. I am sure that any one or two could be eliminated without very serious implications. Also, birds that are well cared for will not suffer if they do not receive the desirable supplements for occasional periods of a couple weeks or so, such as a vacation period when it is difficult to assure the same kind of care you personally would provide.

In my early days of breeding Gouldians outdoors, I was barely able to raise as many as I lost. I found that my heaviest losses were during and shortly after the moult as well as lighter losses all through the year. Really they were completely unpredictable. While they did not seem delicate, they were problems without question.

For some time I had felt certain that the very heavy moult and intense color of these birds might be a heavy strain on their systems, as is a generally accepted fact. However, I also wondered what this might physically remove from their bodies, and if something was removed, was it available in their aviary diet. As a possibility, I took to a laboratory, a group of the bright adult feathers that had been shed in the moult. These were reduced to ash and then analyzed. Of all elements present in this ash, only one was not apparently available in adequate quantity in my aviaries — ARSENIC. After consulting avian pathologists, I found that

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arsenic bearing tonics were commonly fed to poultry by commercial breeders for the purpose of stimulating growth and egg production as well as control of coccidiosis. My Gouldians now have an arsenic solution available at all times in addition to their regular drinking water. This is Ren-O-Sal which is a commercial arsenic bearing tonic produced in tablet form by the Dr. Salsbury's Laboratories in the United States. Each tablet contains arsenic in the form 3-Nitro-4-hydroxy-phenylarsonic acid (0.2 grain arsenic per tablet expressed as arsenic trioxide). I use two tablets to a gallon of water and make the solution available to the birds at all times.

Feed

The staple seed for these birds is canary, white millet, and small yellow millet or panicum. You can keep them and raise young on this diet alone together with water. However under these conditions fewer young will be raised and the mortality rate of both juveniles and adults will be high.

I prefer to provide each kind of seed in a separate container but it is satisfactory to mix them together in the proportions that the birds seem to eat. In the case of mixed seed you can tell at a glance which types are in too large or too small quantities by the kind that is left in the seed tray or feeder. If, after the birds have been eating for a couple of days, the combination in the tray appears the same as you originally mixed, then you have correct proportions. If, for example, you see mainly small millet left then you should reduce its proportion. The proportions of seed consumed will change with the bird's needs through the year.

Gouldians are very fond of grass seeds that are in the milk stage. Almost any kind of grass seed is good for example, rye, winter grass (Poa), water grass, millet, etc. Greens such as plantain (Plantago), endive (Cichorium), dandelion (Taraxacum), water cress, etc., are also beneficial. These may be planted in the aviaries (not under perches) to save time. Mature plants should be sent. Seeding is not satisfactory because the birds will eat the plant as soon as it sprouts so it seldom has a chance to reach any size. They also like to nibble on the tender roots of grass and weeds. These can simply be pulled up roots and all and placed on the floor of the aviary.

Charcoal is always available in the wild from forest or brush fires, camp fires, etc. The birds will use small quantities of this occasionally and it does seem to serve a beneficial purpose.

Germinated seed is greatly relished by Gouldians. This is another valuable food. In seed that has germinated the starches have largely converted to sugar and the vitamin content has increased many times. About one tablespoon of germinated seed a day is ample for half a dozen birds.

One simple way of sprouting this seed is to soak some of your regular finch mix in water for 12 to 24 hours. Then rinse it, drain off the water, and leave it moist in a glass or clear plastic container with a lid in a reasonably warm locality for 3 or 4 days. Sunlight through the glass will help create warmth in the container and speed the germination. It is ready to feed when the small rootlet begins to emerge from the end of the seed. It should of course be thoroughly rinsed again with fresh water before being given to the birds.

A solution of one part molasses or corn syrup and five parts water has proven very beneficial. This is high in some of the various vitamins and minerals as well as being an energy producer. Supplementing the diet with molasses or corn syrup does not produce the harmful side effects that result from honey. While the birds like a honey solution, its use over an extended period is likely to have adverse physiological effects.

The nectar solution of course must be arranged in a manner that prevents the birds from bathing in it. It is not difficult to imagine the sticky mess that would otherwise result. Ants are another consideration that cannot be overlooked when locating the feeders or dispensers for the molasses solution. Suspension from the aviary top so that the feeder is conveniently located in front of a perch is one possible method. Some of the types of feeders that are used for Hummingbirds work well. Carbolated petroleum jelly (treated with carbolic acid) on the aviary wire around the feeder or on the supporting wire helps to prevent ants from reaching the nectar.

I have never been able to get these birds to take any appreciable quantity of insect food of the kinds available here. There does not seem to be any need for insectile foods so I no longer make them available.

Gouldians are quite sensitive to sudden changes in diet. So before you purchase new birds, be sure of their previous diet so that you will not make radical changes too fast.

Salt (NaCl) is always available in my aviaries in two forms. I use the spoons that are made for rabbits and provide the one containing sulphur and the one containing miscellaneous trace minerals.

There is considerable sulphur in egg yolks so that obviously when a hen is laying, the sulphur used from her system should be replaced. She gets some from her seed but mixed in the salt lick it is a convenient way to assure an ample supply. The sale and mineral lick is simply another way to make trace minerals available. You will see the birds touch their beaks and tongues to these. This salt, being very corrosive, will damage the aviary wire very rapidly. To overcome this they may be hung by a wire from the top of the aviary so that the spool or salt block is suspended close enough to a high perch for the birds to reach it without difficulty. Then as the salt deliquesces in the damp weather, it will drip to the floor of the aviary without damaging the wire.

Finely ground oyster shell, sterilized ground egg shell, or cuttlefish bone and ground feed quality bone meal are always required.

Grit or gravel should always be available to most kinds of birds. It is, as I am sure everyone is aware, a digestive aid, which serves to grind the food in the gizzard. Stream washed sand should always be used instead of the sharp crushed granite that is sold by some suppliers. The sharp grit will be used by the birds if they do not have a choice but it will cause gizzard erosion and consequent trouble. If you closely observe birds in the wild state you will note that they pick rounded grit. This is nothing new in the poultry industry.

Mites

Control of mites or bird's lice is essential to raising your Gouldians. A few mites will not harm the birds but an infestation is another story. Control to prevent infestation is what is necessary. These pests are seldom a problem in the winter, however when the weather begins to warm up in spring the danger begins. At this time the mites multiply astronomically and continue through the warm weeks of fall. Nests are favorite points of concentration for them. Spraying or dusting nest boxes before they are put up and between clutches of young takes care of a large percentage of the problem.

There are four insecticides that I believe are particularly good for mite control. They are Malathion, Methoxychlor, and Dri Die 67 and Buhac. The residual effectiveness of each of these is very good which makes spraying or dusting necessary only three times a year, spring, summer, and fall, for effective mite control. Spring and mid-summer spraying would probably actually be adequate.

Malathion (0 o-dimethyl dithiophosphate of diethyl mercaptosuccinate). This is an oil base material that mixes readily with water. A 3% solution sprayed over the inside of the shelter and perches and in nest boxes before hanging is very effective. Care should be exercised not to contaminate the feed or water with this spray. While it is not necessary to remove the birds while spraying, an effort should be made not to spray it directly on them. Malathion, while an excellent insecticide is dangerous unless used with caution. Birds should never be in an enclosed or unventilated area such as bird rooms and closed shelters where this chemical is being sprayed. The confined fumes of Malathion can do very serious harm to you as well as your birds. Care should also be used in obtaining the right concentration. If you mix it too weak, it will be ineffective and if too strong, it may kill your birds.

Methoxychlor 2, 2-bis (p-methoxyphenyl) 1, 1, 1-trichloroethane. This is a wettable powder that may be used as a spray or dust. It has a very low toxicity to man and animals. It is easy to use, safe, and very effective. There does not seem to be any harm if the birds fly directly through the spray or dust when it is being applied to the aviary. A liberal sprinkling of the powder in the cracks and crevices of the nest boxes tends to control mites in the nests for an entire breeding season.

Dri Die 67 (Silica Aerogel). This is an extremely fine, light weight, powder which is available in plastic "squeeze" bottles for easy application. It is a completely non toxic inert dust. In fact it is not even poisonous to the mites. It kills by a mechanical rather than chemical action. It breaks down the wax coating that exists on the bodies of many types of insects allowing the rapid loss of the body fluids. It adheres well to the feathers of the birds as well as the surfaces of the aviary. For our purposes here this in my opinion is one of the best insecticides that has been developed to date.

Buhac (Pyrethrum). This is a fine powder containing pyrethrum and an inert carrier base. It is one of the best insecticides because it is very toxic to arachnids and many other types of lower animals but yet has a very low level of toxicity to warm blooded animals. It is easy to apply in dust form and may even be blown into nest boxes containing newly hatched young (a procedure best avoided unless mite trouble is suspected) without adverse affects on the babies.

Healthy young Gouldians before they are feathered will lay in the nest with the posteriors toward the edges of the nest and their necks crossing to place the head

on the shoulder of another. This gives the appearance of the necks being entwined. If they are infested with mites, they will all be separated in the nest.

Summary

The above facts can generally be considered as contributing to 1, Rearing larger quantities of vigorous young or 2, Reducing mortality after the young have left the nest. Quite a few will contribute to 3, Quantity, quality, and longevity.

In Category 1, Quantity and quality of young would be:

Not overcrowding.

Compatible pairs — Let the hen take her choice of mates if possible.

Separation of sexes between the end of the breeding season and the end of the moult.

Proper and adequate nesting facilities and materials.

Nest building assistance to lazy nest builders.

Sulphur salt.

Forced summer breeding.

In Category 2, Reducing mortality would be:

Epsom salt.

Mineral salt.

Charcoal.

Grit.

In Category 3, Quantity and quality of young and longevity:

General feeding.

Arsenic.

Germinated Seed.

Calcium carbonate (ground egg shell, oyster shell, cuttlefish bone, etc.).

Bone meal.

Mite control.

Ample supply of clean fresh water.

Grass seed heads in milk stage.

Adequate food, water, shelter, and nesting facilities together with parasite and breeding control well summarizes the Gouldian's requirements.

While this is long, it is not complicated. It is mainly a matter of interest and conditioning oneself to a schedule (which the Gouldians must to a degree be forced to accept; e.g., summer breeding and winter abstinence). The feeding, while numerous items are presented, is not difficult nor particularly time consuming if you use a little initiative in arranging feeders, etc.,

If this procedure is not too much work for you, you will be able to raise Gouldians almost as readily as Zebra finches and their mortality rate will be surprisingly low. The Gouldians will come from your aviaries and mine and there will be plenty of them. I hope that this helps to assure a supply of these fancy priced beauties ■