



THE SIMPLE LIFE



HOW NEW FRUITS CAN BE MADE BY CROSSING



MAKING new varieties of plants, by crossing, is essentially a work for the real amateur—the lover of plants—to whom the development of something new, something different and something better than what has been before is a sufficient reward. As a money-making proposition it is hardly likely to pay the average man. It may pay certain specialists, but even they are few.

The principles of the procedure are not at all complicated. On one hand we have the pollen of a given variety, and on the other hand we have the fruit-bearing flower of another variety. Our object is perhaps to combine the essential qualities of both these varieties and to this end we make the cross by transferring the pollen of one to the pistil of the other. If this is done in both directions, what is called "reciprocal crosses" are produced. Usually these differ materially from each other; and more than that, in all probability out of a number of plants raised from any given cross, no two will be alike, some will be fairly intermediate, some will partake more strongly of one parent and some of the other parent. Out of all these once in a while there will appear one particular plant of decided merit. When such a plant is obtained, happy is the originator because he will have really added something of value to the world of horticulture and will have won for himself the right to occupy a small niche in the temple of fame.

When to Prepare the Flower

The flower that is to be the seed bearer must be so handled that no pollen other than that desired shall reach its pistils. Therefore the stamens are removed. The ideal time for this is as late as possible before the anthers burst. But where a large number of blossoms is to be pollinated, it is not practicable to wait until this time before beginning work. If warm weather is pushing the buds into blossom very rapidly, the work may begin when the buds are still quite small.

The disadvantages of early work are greater liability of injuring the pistils by the weight or chafing of the sack, if one is used, and still greater danger that some small stamens will be left in the blossoms, since they are much more difficult to remove at this time. Furthermore, it is not so easy to operate quickly when the buds are four or five days from opening. In general the best way is to remove the stamens as late as possible before the anthers mature and before the petals have unfolded enough to expose the pistil or permit the visits of insects.

When a hot day or warm rain has forced into full blossom in a few hours buds that the experimenter calculated would not be open for several days, he is strongly tempted to use slightly opened flowers in which no stamens have burst. No blossoms that have opened enough to permit the entrance of insects, even though the anthers or pistils are not mature, should be used, if accurate results are desired.

When complete accuracy is not essential, and when working on blossoms that normally do not mature stamens and pistils simultaneously, so that self-pollination is improbable, the stamens need not be removed. Luther Burbank once wrote me that he removes the stamens from but a small proportion of the thousands of blossoms that he uses every year. Professor S. B. Green says: "In the case of apples and plums, I do not think it pays to emasculate at all." Non-emasculation is practised more commonly west of the Mississippi than in the East. The chief reason for this difference in practice seems to be that the pistils of fruit blossoms in many parts of the West are apparently more likely to mature before the stamens than they are in the East. At any rate much better success is obtained in the West from pollinating pistils a day or more before they become receptive than has been secured in the East. I have tried it in Michigan, with poor results; but Mr. M. B. Waite found this method satisfactory near Washington, D. C.

This practice rests upon the probability that the pollen which reaches the stigma, first effects fertilization in a majority of cases; if, therefore, fruit blossoms are cross-pollinated by hand before they have shed their own pollen, emasculation should not be necessary, provided the pollen sticks and grows. Crossing without emasculation is entirely feasible and fairly reliable, especially with blossoms in which the pistils mature exactly with or a little before the stamens.

What Blossoms to Use

The pollinator soon learns that some trees or plants of the variety under experiment are more valuable for his purpose than others, and, furthermore, that some blossoms are better for crossing than others on the same tree. Some trees seem to have strong reproductive power and their crosses set fruit in gratifying numbers. Other trees that blossom just as full, and apparently have equal vigor, make a poor showing after the June drop, when the count of crosses is made. Very old, diseased or sickly trees should be avoided, no matter how full of blossoms they may be; also avoid very thrifty trees just coming into bearing. Mature trees of moderate growth, and perfectly sound, are the safest to use.

It is rarely wise to work on the lowermost limbs, especially if the trees are tilted. Blossoms on inside branches are also undesirable. The best fruit is usually borne high up on the outside of the tree; crossed fruits should have

at least as good a chance as any others and should be beyond molestation by teams or vandals.

Select blossoms on the side of the tree opposite from the direction of severe prevailing winds, which may whip off the fruit. If nearly open buds have been subjected to a hard frost, just before emasculation, it may be wise to use only the blossoms on the west and north sides; those on the east and south sides are more likely to have been injured by the frost. Select blossoms on well nourished branches and fruit spurs. Blossoms on terminal shoots are not apt to set as well as those on strong laterals. Weak buds are usually later in opening than strong buds, and it seldom pays to use these for crossing when the normal blossoms are too far gone.

It is an advantage to include within one sack several blossoms of slightly different degrees of maturity, as is necessarily the case with apples, pears, oranges and grapes. There is then a greater chance of pollinating at least one of them when it is in just the right stage. It is doubtful if it pays to work on more than three or four of the apple and pear blossoms in a cluster; the others should be pinched off. But nearly all the strong blossoms on a branch of plum or peach may be used. Much, however, depends upon the method of fruit bearing of the variety.

Various tools are used, depending upon the kind of blossom and also upon the skill of the person. In a majority of cases, a small, sharp dissecting scalpel is preferred, especially for

less the cut can be made so low as to remove the top of the ovary and the entire nectary. A majority of pollinators, however, are of opinion that a cut made at the insertion of the stamens and above the nectary is about right.

When to Apply the Pollen

This depends very largely upon the kind of blossoms used; each fruit must be studied independently. The only point that needs to be considered here is whether to pollinate at the time of emasculation or to wait until the pistils are receptive. The latter method is most commonly practised, but the former has many advocates, especially in the South and West. With reference to this point, Mr. T. V. Munson says: "I always pollinate at once after emasculation, as the fresh pollen grains are usually gummy enough to adhere to the soft, spongy stigma. But the pollen grains do not begin to germinate until the stigmatic juices exude and moisten them." It must be remembered that Mr. Munson's work has been largely on grapes.

The success of this early pollination depends, first of all, upon the stage of development of the pistils when the stamens are removed. When blossoms are emasculated but one or two days before the stigmas become receptive, there seems to be no doubt but that the pistils may be pollinated immediately.

The chief advantage of pollinating at the time of emasculation is the saving in time; the chief disadvantage is the uncertainty that the pollen will remain on the stigmas until they

skin, with pus containing micro-organisms (streptococci) and white corpuscles (leucocytes). Later the grapelike tumors or fungoid growths appear and are of a red or purplish color and bleed easily, being highly vascular, and tend to grow quickly when removed. This disease proves chronic, is most difficult to remedy and must, from the description given, be familiar to most men who have had to do with draft horses, although it is alleged that a certain celebrated Scottish horse breeder once sniffed, sneered and said: "Surely here must have been a skunk about," when his olfactory nerves were assailed by an odor which really had emanated from the grease-affected legs of a stallion, of a breed in which he was not particularly interested. This expression of opinion will serve to suggest one of the most characteristic indications of grease, viz., its atmosphere-impregnating stench.

Although the disease in question is well-known to importers, dealers and breeders who handle heavy draft horses, it cannot be said that they sell stallions affected with the disease. To be sure every heavy draft horse possesses a more or less strong tendency to develop grease under certain aggravating and wholly unnatural and unnecessary conditions and circumstances, but the wise horseman obviates these causative factors and so escapes the penalty, or merely has to deal with a few cases turned over to him by disgusted patrons who have only their own ignorance and negligence to blame for the appearance of the disease in the horse they have purchased—and

legs ragged, ulcerated, studded with grapes and weeping an ichorous discharge. On arrival at the farm he was put into an 8x12 box stall away from all stock, with no window or door to look out of, with little ventilation other than that unintentionally provided, with nothing to do and nothing to see and no one to say a kind word to him or pay him frequent friendly visits. On many a farm a basement barn was the spot selected, and here the stallion stood for months at a time from the close of the breeding season to its opening in spring. For a time the attendant tried unskillful methods of grooming, but irritated the horse, of which he was scared from the start, until at length sundry nips and bites and kicks ended in actual vice, and the groom or farmer, fearing to enter the stall, left the horse alone, standing in ever-accumulating filth, and fed him corn, corn, corn, and then more corn, through a hole in the wall. Naturally these unnatural conditions induced filth of skin and overfatness and sluggish, impure blood, and all manner of ills inevitably followed in their wake. One of these, and the one most sure to come, was the grease that proved incurable and so led the owner to return the horse to the seller for "repairs" which a new stallion (of course of some other breed) was bought in his place to be similarly ill-treated to the detriment of all concerned.

On the contrary, the stallion on arrival at his new home should have been given a roomy, airy, light, cheerful box stall, not in a basement, and with a large paddock attached in which to take exercise, so that he would not feel lonely, a prisoner like a wild beast in a menagerie; for a horse is a companionable beast, wanting and needing company and friends, liking to look about him and to know the joy of living with all of the good attributes of nature such as fresh air, sunlight, fresh water, mixed rations, the little luxuries of bites of green stuff and nibbles of clean earth and the great and necessary care of thorough grooming, muscle massage, expert attention to skin and feather and abundance of exercise in company with a kind, appreciative, expert, friend and "boss" on every suitable day the year around. Work in harness is always very profitable.

Drugs cannot take the place of these natural, just and necessary things; nor can drugs, internal or external, with certainty cure the grease that has come from the unintelligent and inhuman treatment of the horse. In the first place, it is best to prevent the disease by maintaining the health of every organ of the body—not by administration of drugs, but by exercise, thorough grooming, intelligent feeding and sanitary stabling; but if a case at any time has to be treated, as early as possible inaugurate all of the healthy and natural methods of care and management outlined here and there will then be some hope of restoring the horse to his normal possession of health and vigor.

As to the treatment the aim should be to get rid of every trace of effete matter in the body and this is best done by the administration of purges and then by outdoor living throughout an entire year, during which time if possible make the horse work for his feed and let the feed be of the plainest sort—in bad cases hay, fodder, roots and bran but no oats, corn, other grain or soft mashes. Just make the stallion an ordinary work horse for the time being, but feed him spare rations so that he may work the fat off and out of his system and in so doing gather an entirely new complement of pure blood and renovate the tissues it builds and nourishes. Apart from this there is no royal road to success in treatment and each practitioner has his favorite remedy or system of treatment. It may be said, however, that Fowler's solution of arsenic given in half ounce doses two or three times daily is usually employed with benefit, and after removing the long hair from the legs (in bad cases) either powdered or liquid astringents are to be employed to help dry up the discharge and relieve the inflammation and soreness of the skin. In cases where grapes are abundant these growths have to be got rid of by use of the actual cautery which may be the special instrument of the trained veterinarian, where he can be employed or, if that is impossible, one may resort to the old plan of cutting off the growths, one at a time, with the edge of a blacksmith's shovel heated red hot applied against the neck of the growth under which a wet, cold shovel is held against the skin to prevent scorching of healthy parts.

As a sample of local treatment, somewhat different from that so often prescribed, we reproduce the following from the columns of The Australasian:—

"First clip the hair away and wash the parts thoroughly with warm water, soap and washing soda. Wipe dry with soft clean cloth. Then apply gently by dabbing (not rubbing with a piece of cloth tied on a stick, a little of the following mixture: 1. Formalin, 1-2 ounces, in one pint of water. 2. Sulphuric acid (dilute) 5 ounces, in a pint of water. Numbers 1 and 2 are to be used on alternate days. Finally dust the parts once or twice daily with equal parts of oxide of zinc and calcium carbonate (chalk) well powdered and mixed. Tie horse to prevent biting."—A. S. Alexander, V.S., Wisconsin Experimental Station.

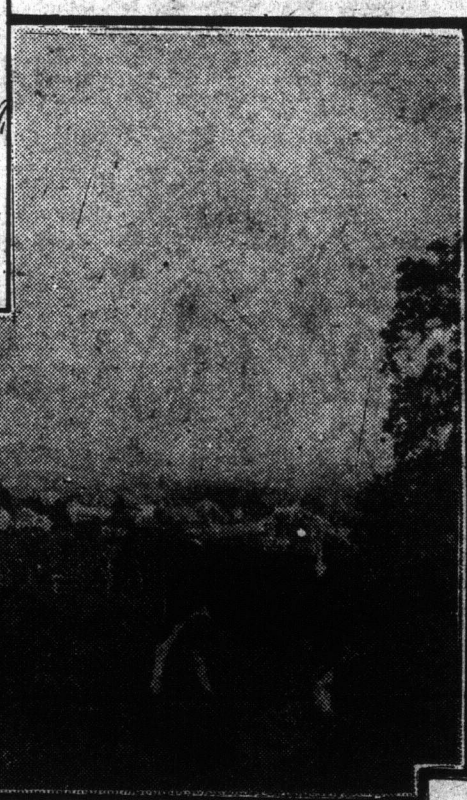
Good pasture with bathing water, and very little grain, are all the horse requires; and, when marketed, the profit is so nearly the whole amount received, that one wonders why so few geese are raised.

HOLSTEIN COWS



A Popular Breed of Dairy Cows which are being widely used by Vancouver Island dairymen.

SWAN LAKE DAIRY VICTORIA



the stone and pome fruits. The bud is held between the thumb and forefinger of the left hand and the sepals, petals, and stamens removed in two or three cuts. In some cases a scalpel with a curved blade is more serviceable. A pen-knife with a sharp, thin blade may answer just as well. Professor J. C. Whitten is partial to a knife with a blade rounded on the end, like a budding knife, but much smaller. The knife or scalpel must be kept razor sharp; if the slightest bit dull the speed of the operator is much reduced and ragged wounds or tears may be made.

Next to the scalpel the most popular instrument is a small, sharp-pointed pair of dissecting scissors. Curved scissors are preferred by Professor H. J. Webber when working on orange blossoms. For the blossoms of stone and pome fruits, I have found scissors more tire some and less efficient than a scalpel. For some kinds of blossoms, especially small ones that are partially opened, the tweezers, preferably compositors' tweezers, are a practical instrument. The stamens are grasped about half way down the filaments and broken off at that point—not pulled out.

For grape blossoms, and all others having small anthers that must be removed separately, Mr. T. V. Munson and others recommend a slender pin, such as is used in mounting small insects, with one-quarter inch at the pointed end flattened and bent into an acute-angled loop. This may be inserted into a wooden handle for convenience. For strawberries and bush fruits, Professor F. W. C. Beach prefers a little spatula made from a flattened pin and filed very sharp. Delf fingers are also very serviceable at times. Professor S. A. Beach finds that when grapes are in just the right condition he has been able to do the work most readily with thumb and finger.

There is a great temptation to make the cut too low on pome fruits, especially if using a scalpel. I have concluded that it is best to make the cut not any below the point where the stamens are inserted, and the higher the better, so far as the setting of fruit is concerned. But the higher the cut is made, the less rapid is the work and the greater is the likelihood that small stamens will escape the knife. Mr. M. B. Waite endeavors to "cut just above the top of the ovary, through the base of the calyx, below the stamens and into the nectary, leaving the centre portion of the nectary behind," and he says, further: "Doubt-

are receptive. It often happens that after blossoms are emasculated several days of cold, rainy weather intervene and keep the blossoms at a standstill. In such cases immediate pollination would not be effective. Professor I. L. Budd states that the tendency of most people is to pollinate too soon rather than too late. If emasculation is delayed, however, until the buds are nearly open, there is no doubt but that immediate pollination is successful, provided the weather continues favorable.

(To be Continued.)

AROUND THE FARM

GREASE AND GREASE HEEL

The term grease is applied to that abominable condition of the back of the legs, under the knees and hocks, in heavy draft or lighter horses, which is characterized by a thin, greyish, soapy feeling, extremely offensive smelling discharge which comes from cracks, sores or fungoid growths, called grapes by horsemen, and most usually found on the parts covered by long hair or feathers. In such cases the back part of the leg, including the fetlock and under it, is involved and the leg is found immensely swollen and at the outset of the trouble is feverish and sore. In grease heel the disease is confined to the heels and to the skin between the heels and the back of the fetlock, where ordinary scratches are found, and in bad cases it may implicate the entire coronet which will be found with hair erect, or in tags, clusters of grapes studding the skin and giving forth the fetid exudate mentioned and which often is so profuse that it flows from the affected part onto the stable floor or ground.

While horsemen differentiate between the conditions just described, they are identical in character and cause, grease being simply a more generalized outbreak of the same skin disease localized in the parts affected in grease heel. The trouble starts with erythema (simple inflammation of the skin) and soon implicates the deeper structures of the skin, including the hair follicles in the sebaceous glands; then comes a swollen condition accompanied by sluggish circulation of blood, outpouring of inflammatory lymph into the tissues, appearance of the fetid exudate and with it necrosis or death and sloughing of external layers of the

abused. For it is abuse of the heavy draft horse that brings out the disease and the abuse runs along well defined lines which easily might be avoided.

In the first place, it should be remembered by the buyer of the heavy draught stallion that every horse of such temperament inclines to become fat, heavy, sluggish and phlegmatic, and these are the conditions that inevitably lead to such ailments as grease and lymphangitis. Then, too, it should be understood that the legs of the heavy draft horse are coarser than those of the light horse, having more connective and adipose tissue, coarser skin and more profuse hair. Their circulation is somewhat sluggish compared with that of the thin-skinned light horse of nervo-sanguineous temperament, hence the tendency to stagnation and effusion of watery plasma of the blood into the loose tissues of the extremities is greater in heavy horses, and at the same time, where long hair grows upon their legs, oxidation of outer skin (dandruff or epithelium) is in excess on such parts. With these facts in mind the expert attendant uses his best endeavor continuously to stimulate circulation of the blood and activity of the excretory organs, so that effete matters of the body may be thrown off, and to this end gives his horse ample exercise every day—work in harness is best—and also grooms all of the body thoroughly, and if washing of the extremities proves necessary follows it with perfect drying of the parts, which is absolutely requisite if grease is to be avoided. Then, too, he feeds generously but intelligently. He tempers the amount and quality of food to the work in hand and the season's needs, and in everything tries to maintain the pink of condition conjointly with the perfection of health.

How different is it with many a well-meaning man who finds himself entrusted with the care and management of a heavy draft stallion and with no special training or liking for the work. It is men such as he that give the horse that kind of unintelligent attention which inevitably ends in the inducement of such a disease as "grease," and with it not uncommonly comes the other bane of the stallion seller's business, viz., complaints of indifference, partial impotency, or actual sterility.

Here is the history of a victim of such ill-treatment from the time he left his importer's hands until he returned to him in two years—a lifeless, sluggish, dirty, woe-begone object, stinking and covered with sores, his