



## Hybridizing and Crossing the Grape.

A REPORT FOR THE DIRECTORS OF THE FRUIT GROWERS' ASSOCIATION OF CANADA.

GENTLEMEN.—There is no practice more fascinating and instructive in the whole range of horticultural experience, than that of producing new varieties of fruits by the art of hybridizing. It brings the operator into very intimate relation with those laws which govern the production of new being. He learns that nature, in her great laboratory, contains unlimited material for the development of man's skill; it makes him comprehend that beautiful liturgical expression,—“As it was in the beginning, is now, and ever shall be.” He sees the strongest analogy between the vegetable and animal kingdoms; he acknowledges, with a subdued spirit, the harmonious relation of forces; and with a thoughtful, inward, voluntary praise, worships the ALMIGHTY.

That the mode of operation may be clearly understood, he should examine the flowers of the grape at different stages of development with the microscope. He will see that the whole cluster contains many distinct flowers, each one of which is capable of self-fertilization, and has a cap composed of five petals cohering, which is raised up and thrown off by five expanding stamens contained within the cap; each stamen holds a small cup, called an anther, at its summit, containing the pollen, or male essence, beautifully surrounding the stigma, the terminal point of the pistil or female organ—the crown of the fruit in embryo; this apex contains a viscid substance to which the pollen adheres when brought in contact by the air or insects; when the grains of pollen lodge here they cannot get away, they penetrate and are absorbed by the stigma, and pass down through the pistil to the ovules or undeveloped seed. These beautiful organs, so suitably adapted to an intelligent end, command our attention. The process of fertilization goes on without our assistance; and it is a startling fact that in a short period the compass of this earth would not be sufficient to contain the reproductive force of a single species, were there favorable conditions to sustain the life of every germ.

When we wish to produce a new variety, by crossing, we place the pollen of one variety upon the stigma of another. Let me proceed to explain intelligibly how the whole process is performed. The operator must secure a magnifying glass, sufficiently powerful to see each separate grain of pollen; a delicate pair of pincers and scissors; a camel's hair pencil; a very small clean and dry vial, with a large neck; a sheet of white, smooth, glazed paper; a thin paper bag to enclose the cluster when finished; and a label to mark the parentage. He must then on a clear dry day take the glazed paper, and with it surround as many clusters as required of any desired kind, in full flower, when scattering their pollens bounteously; snap the paper several times with the finger, it will then contain the pollen; open it carefully, gather the powder with the pencil, twirl it in the vial, and thus proceed until he have sufficient; then cork tight and put in a dark, cool place, labeled for future use. It is necessary that the flowers to be fertilized should be the last to bloom; when these are ready, which will be indicated by some of the caps being thrown off, then, with the scissors, remove two-thirds of the flowers in the cluster, with those already opened, and from the balance, with the delicate pincers, gently remove the caps; this any one will be able to do by a little skilful practice without

injury to the stigma. Cut away the stamens, with their anthers, and with the magnifier observe the viscid surface of the stigma; should there be one with a grain of pollen adhering, cut it off; if not, take the hair pencil, introduce it in the vial, great quantities of pollen will adhere, place it upon the viscid stigma of each. Take the glass again and look; if the points are covered with pollen the work is good; inclose the cluster in the paper bag, tie the mouth and label it with the parent's names; this should all be done in the morning, after the dew is gone; let the bag remain till the surrounding flowers have set their fruit and commenced growing—so as to avoid insects and stray pollen. This practice with the grape will enable the hybridizer to operate with other flowers and fruits; but he must always bear in mind that the success of this undertaking depends much upon the proper selection of the most suitable parents for a desired result; this will always be open to the judgment of each operator; and also that beside the variations of seasons, the different modes of cultivation will perpetually produce varied results. For these reasons I would recommend all those who are trying their hands in this direction, to continue their operations from season to season. It will be found also, in the course of practice, that the difference in sexual conformation prevents certain kinds from hybridizing; but I have no doubt that this disparity will be overcome by first breaking the habit of these by more mutual crosses.

Mr. William Saunders, of London, Ontario, has, with much skill and labour, produced this season the following results in hybridizing, and has kindly permitted me to lay them before you.

FEMALE OR BEARING VINE			
Clifton—	with Syrian pollen	Set 18	Berries.
“	“ Muscat Hamburg, 2 bunches	“	0
“	“ 1 failed, the other set	“	1
“	“ Buckland Sweetwater	“	30
“	“ Muscat d'Avon	“	8
“	“ Black Hamburg	“	5
“	“ Grizzly Fontignau—failed	“	0
“	“ Black do	“	0
“	“ Chasselas Musque	“	5
“	“ Royal Muscadine	“	22
“	“ Victoria Hamburg	“	19
“	“ Rose Chasselas	“	13
Total			121

OF GOOSEBERRIES			
Houghton's Seedling with	Warrington pollen	Set 6	Berries.
“	“ Roaring Lion	“	2
“	“ White Smith	“	1
“	“ Brown Girl	“	5
“	“ Ashton's Seedling	“	2
“	“ Crown Bob—failed	“	—
Total			16

Eight or ten flowers were operated on in each case, excepting Crown Bob, which was used on five only. He also operated on six or seven flowers of the Philadelphia Raspberry, with the Brinkles Orange; such were his results. Mine were as follows: I was unable to fertilize the Delaware with either the Black or Muscat Hamburgs, while one took readily with the Diana.

MALES.	FEMALES.	CLUSTERS SET	BERRIES.
Black Hamburg	Delaware	2	0
Muscat do	do	1	0
Chasselas de Fontainebleau	do	1	6
Rose Chasselas	do	1	1
do	Diana	1	13
Chasselas de Fontainebleau	do	1	24
do	do Rebecca	1	0
do	do Isabella	1	0
Muscat Hamburg	Diana	1	26
Howard Muscat	Howard's No 4	1	27
Delaware	do	1	17
Total			114

Mr. Saunders' total ..... 121-235

So slow and tedious is the process, it will be observed that only a limited amount of labour can be performed by one person during the time of flowering. Mr. Saunders exceeds me by seven berries. Now to test the quality of only a portion of these which may survive the vicissitudes of germination and other mishaps, it will take from six to eight years. I know no reason why the Government should not protect, by patent, the production of new fruits; they are in point of fact quite as worthy as any other production of science and skill.

Yours respectfully,

WM. H. MILLS.

Hamilton, 21th August 1868.

## Garden Seeds.

FARMERS are sometimes apt to be dependent on the salesman for their yearly supply of garden seed; whereas a little forethought and attention at the proper season, would not only save them annually the sums expended in purchasing seed from the store, but would ensure the required article of the proper age and quality, and would also give better opportunity of making improvements in the different varieties. To do this, however, care and judgment are necessary. It will not answer to adopt the principle of setting aside the last-ripe, or the smallest products of either garden or field, for the next year's sowing. Potatoes too small for use are unfit for planting, and late ripened seeds of any kind will probably yield a late maturing plant the next season. Let the farmer make his selection from known varieties, the qualities of which he has tested. Let him set aside early in the season a single plant or two of promising appearance, for the special object of growing to seed, and bestow on these plants special attention. He will thus secure germs that will probably yield more luxuriant growth and better quality in the succeeding product. He will certainly save himself the disappointment of obtaining old seeds instead of new, or a different variety from that which he expected. Having secured his seed, he must of course be careful to place it in security from damp or the depredations of mice, and must not omit to label each parcel with the correct name, and the date of the contents. These are simple matters, scarce calling for notice, yet in how many instances does failure come from inattention to them. We know not a few who make a point of saving seed in the fall, and yet have invariably to purchase their supply in spring. Mice, or damp, or want of care in labeling, or some other equally trifling cause, have defeated all their pains.

## Gathering Fruit.

THE appearance and the value of fruit depend very much upon when and how it is gathered. Strawberries, if picked carefully, with half or quarter of an inch of stem attached to each berry, and laid carefully in the basket, will carry better, and sell for a greater price, than when pulled hap-hazard, some with hulls and stems on, and some with them off. Again, if they are gathered when they are perfectly dry, they will keep longer and retain a better flavour than if gathered while wet. A little water not only hastens decay, but it rapidly destroys the flavour of many delicate soft varieties. After being gathered, they should never be allowed to stand out exposed to the sun, as with many varieties, it takes but a little while of exposure to a hot, clear sun, to destroy their brightness of color.

Peaches should be left on the tree until they are fully ripe, and then gathered carefully with thumb and finger, and at once laid in the basket or box in which they are to be marketed. If the bloom is rubbed off the peach by rough handling, its beauty of appearance is injured, and it will decay much sooner than if untouched. Formerly it was supposed that the peach must be gathered before being fully ripe, in order to ship it any distance, but practical experience has proved that ripe fruit, not quite soft, will carry quite as well as unripe, and command a much better price.

Pears and apples should never be picked from the tree by breaking the stems. Unless the stem will separate freely from the tree, the fruit is not ripe; it will neither eat nor cook good, and is only fit for those who want a touch of the cholera morbus. Apples, as gathered, may be sent directly to market, but nearly every variety of pear is improved in appearance and quality by keeping in close dark drawers, wrapped in flannel or soft paper, or packed in bran for a few days.

For profit, and in order to obtain the highest price, all fruit pays to be assorted into two or more grades. A few scattering large berries, apples, or pears in a quart or bushel, do not assist in advancing the price; but if carefully packed by themselves will bring the highest price, and often induce the dealer to buy the small fruit in order to get the large.—Horticulturist.