# REPORT ON EXPERIMENTS ABOUT THE SEEDS' SIZE OF KINMEN EARLY KOHLRABI

by

P. N. LEE

## PREFACE

During 1957–58 Taiwan Agricultural Research Institute cultivated kohlrabies at Kinmen, Fukien. There was not a single drop of rain through all the seeding, setting, bolting and even harvesting stages. The weather was so dry that we had to solely depend on irrigation. Plants, therefore, was not brought up well. The size of seeds consequently became smaller. About 70% of grant total of seeds were small ones. We separated them by their size. Each thousand seed that weighed more than 3 gram was considered as the large size which consisted 10% of the sum total. The color of the seeds was brown-black, and the percentage of germination was about 97%. Those that weighed less than 3 gram but more than 1 gram was called the medium size. They were about 20%, brownish, and the percentage of germination was on an average of 64%. Those that weighed under 1 gram were small size. They were about 70%, reddish brown, and the percentage of germination was about 55%.

In order to study how the difference of size would effect their life and their future generation, we made a seed storage test and separate cultivation experiments. The result was as follows:

## RELATION BETWEEN THE SIZE AND VITALITY OF THE SEEDS

We packed 200 gram of samplings of each size seeds and stored them into desicator. We tested their percentage of germination on June 1 just before storage, and then continually and regularly tested them on the beginning of every three months. They were kept for 18 months from June 1958 till December 1959. The result showed a great difference between the size and life of the seeds in storage. The degeneration of the percentage of germination of the large size seeds was only 21%, after 18 months in storage, and life still reserved in the rest 76% seeds; the medium size ones degenerated to 37%, only 27% had life in them; and the small size seeds' percentage of germination was cut to 12% after 12 months in storage, the degeneration was 43%, all the seeds lost their life after 15 months. It is evident then that the small size seeds can not be stored long, and life is very short. The medium size and small size seeds do not have sound organism, their living structure will no longer exist after long-period storage.

Table 1 Percentage of Germination of Seeds in Storage

| Size of seeds | Wt. of 1,000 seeds | % of germination at harvest time | % of germination of seeds in storage | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1958 | | 1959 | | | |
| | | | Sept. | Dec. | March | June | Sept. | Dec. |
| Large seeds | 3.29 g. | 97 | 94 | 91 | 88 | 87 | 78 | 76 |
| Medium seeds | 1.38 | 64 | 65 | 60 | 56 | 46 | 38 | 27 |
| small seeds | 0.76 | 55 | 48 | 37 | 25 | 12 | 0 | 0 |

Explanation: (1) The percentage of germination of seed picking time is based on the seeds picked on May 10, and tested on June 1.
(2) Each germination experiment was the result of the average after 5 times repetition.

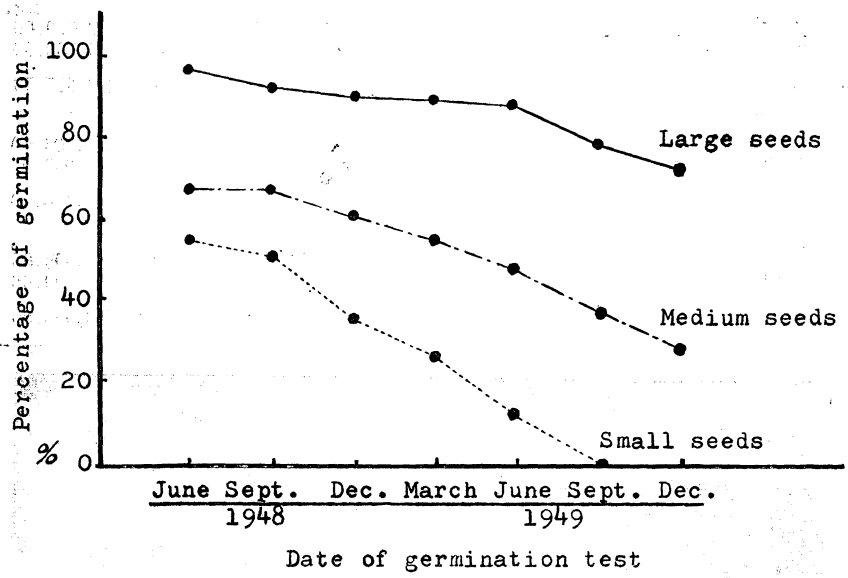



Fig. 1 Relation between the size and vitality of seeds during the storage period

## RELATION BETWEEN THE SIZE AND VITALITY OF THE FUTURE GENERATIONS

Based on the aboved said experiment, the difference between the size and life of the seeds are quite important. In order to examine the physical genetics of the future generation, we sowed seeds of difference size on September 16, 1958 and cultivated them under same environment and condition. The result: in seeding stage the cotyledon of medium and small size seeds were small, light green in color, and not very strong and healthy; while that of the large size seeds were big and strong, green color. 20 days after germination the difference among all size seeds were not worth telling. Setting on October 14, and harvest came on December 24 and January 10. They grew in the field from setting to harvest for 69 days and 86 days respectively. During that period in the field, nothing noticeable about the difference of the color and shape of the leave, or the condition of their buld, based on their

original size of seeds. As a matter of fact, the yield of large size seeds were, whether in early or later harvest, not productive as that of the medium and small size seeds. The average yield of every 10 acre of large size seeds were 2,605.0 kg. Whereas that of the medium and small size seeds were 3,414.0 kg. and 2,998.5 kg. respectively. Therefore, we can be sure that the size of seeds has nothing to do with their yield or with their future generation, but the size of seeds has great influence on seed picking. Also we must consider the demerit or percentage of germination of the medium and small size seeds.

Table 2 Yield Based on the Size of Seeds of Kinmen Early Kohlrabi

| Size of seed | Wt. of 1,000 seeds | % of germination | Date of sowing | Date of planting | Date of harvest | Days of growth | No. of plant per 0.1 a. | Yield per 10 a. | wt. per plant |
|---|---|---|---|---|---|---|---|---|---|
| | g. | | | | | | | kg. | g. |
| Large seeds | 3.29 | 97 | Sept. 16 | Oct. 14 | Dec. 24 | 69 | 50 | 2,029.00 | 405.40 |
| | | | | | Jan. 10 | 86 | 50 | 3,182.00 | 636.40 |
| Average | — | — | — | — | — | — | — | 2,605.50 | 521.10 |
| Medium seeds | 1.38 | 64 | Sept. 16 | Oct. 14 | Dec. 24 | 69 | 50 | 2,893.00 | 579.50 |
| | | | | | Jan. 10 | 86 | 50 | 3,930.00 | 785.95 |
| Average | — | — | — | — | — | — | — | 3,414.00 | 632.70 |
| Small seeds | 0.76 | 55 | Sept. 16 | Oct. 14 | Dec. 24 | 69 | 50 | 2,998.00 | 599.60 |
| | | | | | Jan. 10 | 86 | 50 | 2,999.00 | 599.80 |
| Average | — | — | — | — | — | — | — | 2,998.50 | 599.70 |

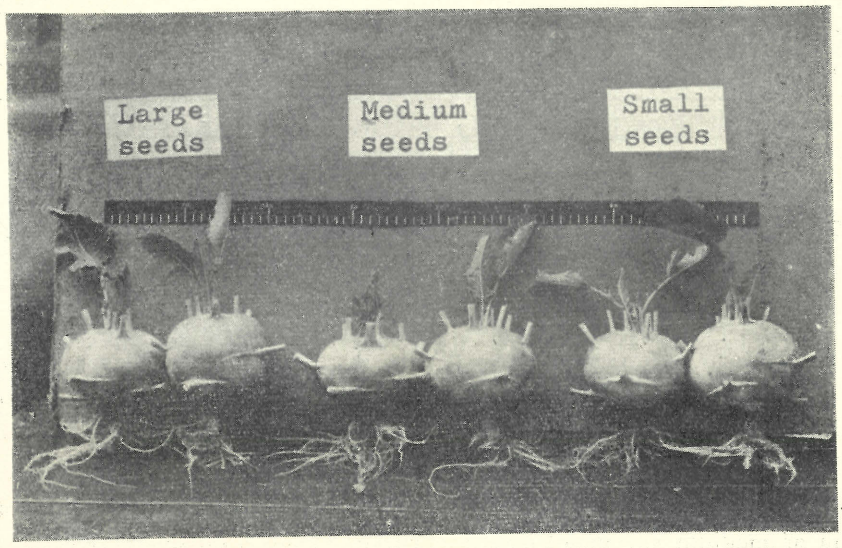



Fig. 2 Comparison between the size of seeds and the form of bulb of Kinmen Early Kohlrabi

## CONCLUSION

1. Influenced by the factors such as the environment of seed-picking place, time of planting, fertilizing, management and the different part of picking, picked the

seeds of same variety may inevitably have different size.

2. Kinmen Early kohlrabi cultivated at Kinmen did not grow well because of dry weather. The size of seeds had obvious difference.

3. The large size seeds have strong organism and promising development, they can be kept longer and still reserve life, medium and small size seeds have weak organism, they can lose their life very shortly in storage.

4. The size of seeds does not affect the yield. The medium and small size seeds can product more than the large size ones. But the germination of the former is not good, and their life can not last long in storage.

# 金門早生球莖甘藍種子大小試驗報告

李 伯 年

## 中 文 摘 要

1. 同品種蔬菜種子，受採種地環境、栽植期早晚、施肥、管理以及採種部位之不同等諸因子之影響，所採種子難免有大小不齊之實際情形。

2. 在金門採種之早生球莖甘藍，受天氣長期乾旱，發育未能十分充分，致種子形粒大小差別甚大。

3. 大粒種子發育充實，生活機能亦强，故在貯藏中不易失去生命。中小粒種子，因生活機能不强，在貯藏中易於消失生命。

4. 在產量方面，不因種子形粒變小而有差別。反而中、小粒種子之產量較大粒種子爲多。中、小粒種子發芽不佳，且在貯藏中易於消失生命，實爲美中不足之處。