ALASKA AGRICULTURAL EXPERIMENT STATIONS
SITKA, ALASKA
Under the supervision of the
UNITED STATES DEPARTMENT OF AGRICULTURE

CIRCULAR No. 2

# BULB GROWING IN ALASKA

BY

C. C. GEORGESON
Formerly Director of the Alaska Agricultural Experiment Stations

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## ALASKA AGRICULTURAL EXPERIMENT STATIONS, SITKA, KODIAK, FAIRBANKS, AND MATANUSKA

[Under the supervision of the Office of Experiment Stations, United States Department of Agriculture]

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CONTENTS



The information in this circular is intended for the use of settlers and homesteaders in Alaska who are interested in the more general growing of hardy flowering bulbs in the Territory. Alaska is very poor in native ornamental plants, and although the Alaska agricultural experiment stations do not specialize in flower growing, the Sitka station in 1923 began an experiment which was later extended to the stations in the interior, to determine the possibility of growing bulbous plants in the Territory. The experiment has demonstrated that hardy flowering bulbs, including narcissus, tulips, English iris, gladiolus, the Regal lily, and hyacinths can be propagated on a commercial scale in Alaska. Lovers of these beautiful flowers should grow their own bulbs so far as possible, as some varieties can no longer be obtained in commercial quantities from foreign countries on account of the risk of introducing pests. Narcissus bulbs, shipped interstate by American growers, are required by a Federal quarantine to be inspected and certified to be free from pests and diseases, and certain States have placed similar restrictions on the sale of other kinds of bulbs.

## NARCISSUS

A few narcissus bulbs have been grown in pots every year at the Sitka station and have always been successfully brought into bloom. To learn whether such bulbs would reproduce by dividing into two

or more and whether the bulblets could be brought to flowering size in Alaska, the Sitka station in August, 1923, obtained several hundred bulbs of narcissus from the United States bulb station, Bellingham, Wash. The bulbs were planted in late September, wintered well, and bloomed in the spring of 1924 as well as do similar plants in the more southerly latitudes. When the tops died down in early June, the bulbs were lifted, separated, and dried, and the new bulbs that had formed were sorted and prepared for planting in late September, 1924. A few of the larger bulblets bloomed in the spring of 1925, and when the growing season was over and the tops had died down, the lifting, sorting, and planting process was repeated.

The season of 1926 was favorable to plant growth, and many of the bulblets bloomed, and together with the bulbs in the original planting produced a profusion of flowers. When the bulbs were lifted at the

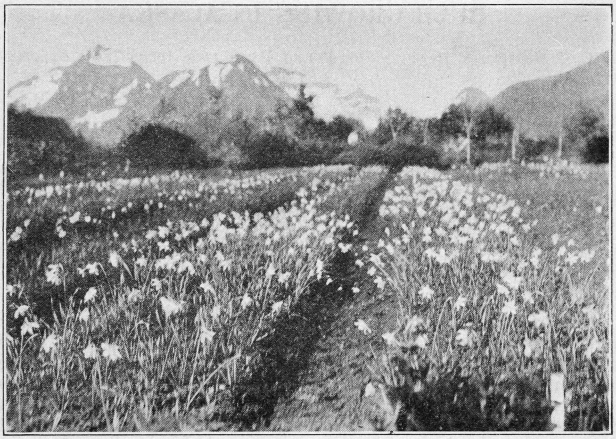

FIG. 1.—Narcissus. Two central beds, variety Mrs. Langtry. Sitka station, 1927

close of the next blooming season most of the varieties showed a large increase in number of bulblets. To provide ample drainage for the bulbs and safeguard them from the excessive rains the beds were raised some 5 inches before planting. As the result of the large increase in bulbs over the original few hundred specimens, over 10,000 narcissus bulbs of all sizes were ready for planting in the fall of 1926. In 1927, the fourth summer of the experiment, the plantings made a fine display of flowers, and many of the bulbs originating at Sitka had developed to normal blooming size.

Results of the experiment show that bulbs originating in Alaska can be propagated normally and that the bulblets not only can be brought to blooming size in two or three years, but also made to produce handsome flowers. Figures 1 and 2 show a portion of the display of narcissus from bulbs which were grown on raised beds in 1927.

It is erroneously thought by some that narcissus bulbs should be grown on sandy soil. The narcissus is not particular as to the kind

of soil in which it grows but for successful flowering requires a well-drained soil. The soil should be so well drained, in fact, that heavy rains will not make it boggy. During the first three years the experiment was under way at Sitka, the bulbs were planted on ground exhibiting considerable variation as regards drainage. On low ground the bulbs were later in blooming and in maturing than they were when grown on well-drained soil. When only low, peaty ground is available the bulbs should be planted on beds which have been raised at least 5 inches above the surrounding walks. The row system of planting is not well adapted to low ground because rows are not so easily raised as are beds which are 3½ or 4 feet wide.

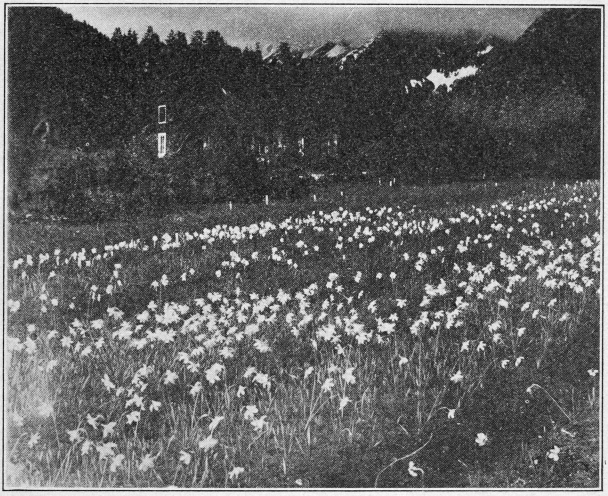

FIG. 2.—Narcissus. Foreground, variety Mrs. Langtry; center, Elvira, a poetaz variety. Sitka station, 1927

It is not necessary to dig narcissus bulbs every year. Once a plentiful stock has been secured, the bulbs should be left undisturbed in the ground for at least two years. Propagation may of course be hastened by separating the clusters yearly. Sometimes bulbs which have been forced in pots during the winter are discarded as useless. Such bulbs should be planted out as soon as the blooms fade and given a chance to mature bulblets. These bulbs will propagate as well as those which are planted especially for the purpose.

### FORCING DAFFODILS

Daffodils, a name applied to a group of narcissus, may be easily forced into bloom during any part of the winter. Only large, well-developed bulbs should be used for the purpose. At Sitka these are planted in late September in 5-inch or 6-inch pots which are half

filled with good garden soil. A potsherd is placed over the hole in the bottom of the container to permit drainage. From two to four bulbs, depending upon the size, are placed in each pot. The bulbs are then covered with soil and watered, and the containers are labeled and buried in the earth to protect them from frost. Roots form during this time. The containers may be removed a few at a time, beginning about December 15, and kept in a cellar or in a room in subdued light where the temperature is a little above freezing until the tops are about 2 inches high. They can then be placed in the full light in a window of a warm room, but should not be exposed to too high a temperature or the flowers will blast. They should be

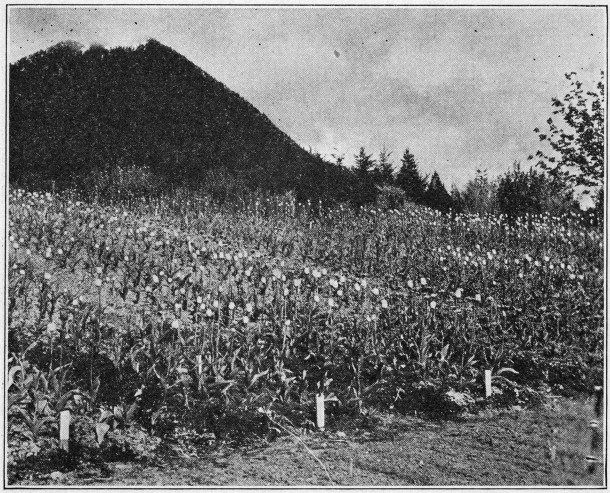

FIG. 3.—Tulip beds at the Sitka station, 1927

watered occasionally, but not kept too wet. The plants bloom usually about January or February.

Hyacinths may be similarly treated.

### VARIETIES

Varieties of narcissus proving to be adapted to the climate of Alaska include Emperor, a large, yellow, early bloomer; Empress, which bears flowers having a white perianth and a golden-yellow trumpet; White Queen, which produces large, white flowers with a pale lemon corolla; Mrs. Langtry, a mid-season kind with a white perianth and pale primrose cup; poetaz Elvira, which bears sweet-scented white flowers with a yellow corolla; poeticus Recurvus, the flowers of which have stems of medium height and are white with an eye margined deep orange red; Minnie Hume, the flowers of which have a large white perianth and a lemon cup; double Campernelle, which bears yellow, sweet-scented flowers on a slender flower stalk;

Conspicuus, the flowers of which are mid-season and have a rich sulphur perianth and a corolla fringed with orange; and Ariadne, which bears white flowers with medium length stems and an ivory-white corolla. Doubtless there are other varieties as good as those above mentioned and some that are better.

## TULIPS

What has been said about narcissus bulbs applies equally to tulip bulbs. (Fig. 3.) A few tulip bulbs were obtained from the United States bulb station at Bellingham, Wash., in 1923. These increased so successfully that over 17,000 were ready for planting at the Sitka station in the fall of 1926. The tulips were treated in all respects like the narcissus bulbs and have given the same good results. Without doubt tulips can be successfully grown on a commercial scale in any suitable place in southeastern Alaska. The location, however, should be selected with care. Nearly all the soil in the region is rich in vegetable matter and in many places requires artificial drainage. A muck soil can be improved by the addition of a liberal amount of coarse sand, or by raising the beds sufficiently to facilitate drainage.

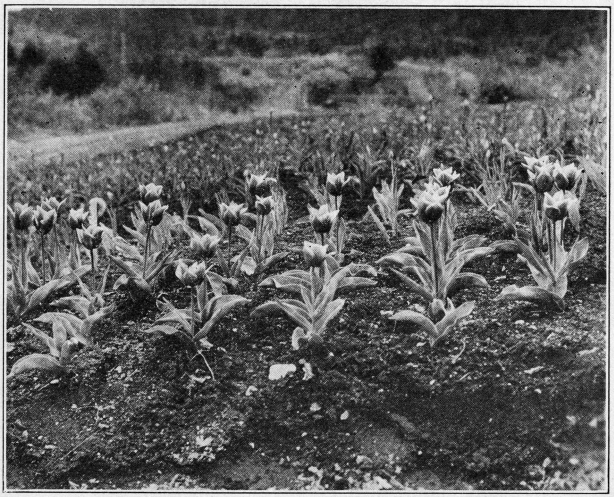

FIG. 4.—Tulips. Variety Bakhuis. Sitka Station, 1927

### VARIETIES

The varieties of tulips that have been found to thrive at Sitka include the following: Blanche Bourde, a dwarf-growing kind bearing handsome, double, purple flowers edged with pink; Yellow Rose, a dwarf-growing kind with yellow, double flowers; La Reine, a dwarf-growing kind which bears white flowers slightly tinged with

rose; Golden Crown, a dwarf-growing kind bearing yellow flowers with edges of the perianth tinged with pink; Mrs. Blugbro, a dwarf-growing kind with yellow flowers tinged on the edges with pink; Golden Queen, a dwarf-growing kind with yellow flowers; Bakhuis, an early, dwarf-growing kind with purple flowers (fig. 4); Carl Becker, a tall-growing kind with light purple flowers; White Queen, a tall-growing kind with flowers blending from white to rose pink; Pense Amere, a tall-growing kind with deep purple flowers; Provost des Excille, and Reine Wilhelmine, tall-growing kinds with deep pink flowers; Vuurbaak, with flower stalk of medium height and crimson color; Rosalind, with red flowers which are white inside at the base (fig. 5); Gesneriana Rosea, with flower stalk of medium

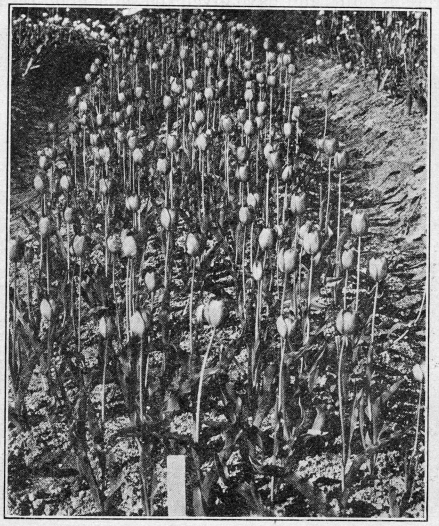

FIG. 5.—Tulips. Variety Rosalind

height and red flowers which are black inside at the base; Maiden Blush, a medium-tall kind with white flowers penciled with cerise; William III, a medium-tall kind with very dark flowers splashed on the inner side with yellow; Remembrance, a tall-growing, late kind with purple flowers; *Tulipa sylvestris*, which is of medium height and bears yellow flowers; Madame Krelage, a tall-growing, late kind, with deep rose-colored flowers; and Ouida, a tall-growing kind with crimson-scarlet flowers.

## ENGLISH IRIS

In the summer of 1924 a few English iris bulbs were obtained from the same source as the other bulbs and grown at Sitka. Some of them bloomed in a satisfactory manner in the spring of 1925. At the

close of the growing season they were lifted, and the newly formed bulblets were separated. All were again planted in September. The lifting, sorting, and planting process was repeated in 1926. In July, 1926, the flowers made a magnificent display. They bloomed about a month later than narcissus and tulips. The iris not only bloomed profusely but also formed new bulblets in abundance. Approximately 2,800 of the bulbs were planted in the fall of 1926 and gave promise of making a fine display of bloom in 1927. The drawback to all bulbs for use as ornamental plants is their short blooming period.

## GLADIOLUS

The gladiolus is rapidly becoming a general favorite all over the country. (Fig. 6.) The garden forms are mostly of African origin

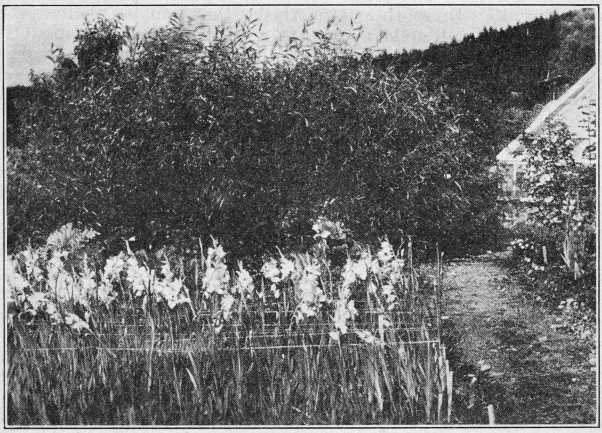

FIG. 6.—Gladiolus at Sitka station

and are not so hardy as are the narcissus and the tulip. Gladiolus will not survive if left in the ground over winter. In 1923 half a dozen full-grown corms of each of several varieties of gladiolus were tested at the Sitka station to learn their adaptability to the climate. These grew successfully, bloomed, and formed a few cormels. It was evident that to obtain a stock of gladiolus the cormels would have to be brought in from the outside and raised to blooming size in Alaska. A few thousand cormels were therefore obtained in the open market at $1 per thousand in 1924. These were planted, and in 1925 some grew to blooming size. The plants were lifted in the fall, and properly dried, and the cormels were separated and sorted. All were again planted in the spring of 1926, and some of the larger ones made a fine display of bloom. Of the 20 varieties tested, the kind known in the States as "America" excelled in point of size and beauty of flower. At the close of the growing season the plants were again

lifted, and the many thousands of cormels which had formed were separated and sorted. Unfortunately all the stock which was ready for planting in the spring of 1927 was destroyed when the propagating house burned April 5. A few corms of each of a dozen varieties were immediately purchased and planted. They are now growing and give promise of bloom, but it will take some years before another supply of home-grown stock can be brought to blooming size in Alaska. The experiment has amply demonstrated that cormels can be formed and brought to blooming size in Alaska.

A drawback to the gladiolus is that it blooms late in the summer. Root formation takes time, and the flowering stems do not appear even on the earliest varieties before early July. The blooming period is therefore chiefly in August, and late-blooming varieties may be caught by cold weather before they bloom. The corms should be wintered in a frost-free place and planted in the spring, preferably about May 15. In southeastern Alaska they can be planted about May 1, but they will make no growth until the soil warms up. Often cormels which seem to be too small to bloom will send up a flower stalk. Cormels at the station which were no larger than a good-sized thimble showed bloom and could be classified by colors. A selection should be made from the earliest bloomers for perpetuation.

## THE REGAL LILY

The Regal lily (*Lilium regale* or *L. myriophyllum*) was also tested at the Sitka station. The plant grows wild in China, whence it was introduced into North America some years ago. It grows to a height of 3 feet and produces many narrow leaves and large, fragrant blooms. It will not thrive in a mucky, poorly drained soil and makes its best growth on a gravelly hillside.

Bulbs of blooming size are expensive, but they can be raised from seed. At the Sitka station bulbs were raised from an ounce of seed sown in flats in the propagating house in the spring of 1924 and transferred to the open in May. They made poor growth, but approximately 50 per cent of them survived the winter of 1924–25 without protection. They were left in the ground and a large percentage again survived the winter 1925–26, but suffered from the excessive rains. In September the seedlings were transplanted to a specially prepared bed which was dug 12 inches deep and filled to a depth of 4 inches with coarse gravel and topped with a layer of soil 8 inches deep. They survived the winter of 1926–27 and began to make vigorous growth in the spring of 1927. It may require an additional two years to develop them to blooming size, but the results show that the Regal lily will thrive in Alaska and can be propagated from seed for distribution to garden lovers who have the proper facilities for raising the seedlings.

## TESTS IN THE INTERIOR

In the summer of 1926 it was decided to experiment with narcissus, tulips, and crocus at the Fairbanks and Matanuska stations to learn how the plants would thrive under interior conditions. Of the narcissus, the varieties tested included Emperor (32 bulbs), Ariadne (103 bulbs), and Conspicuus (95 bulbs). Of the tulips, the varie-

ties included Bakhuis (32 bulbs), William III (100 bulbs), Ouida (136 bulbs), and Madame Krelage (46 bulbs). Each station received 430 crocus corms. All the bulbs were planted in the fall. Of the tulips, the Bakhuis came through and bloomed at Fairbanks, and only a fair percentage of the Madame Krelage lived and bloomed. The Madame Krelage was the only variety showing signs of life in the spring of 1927. All the other bulbs, including the crocus, winter-killed. At Matanuska, three narcissus bulbs of the variety Emperor survived the winter and bloomed. Of the tulips, 16 of the Madame Krelage bulbs survived the winter. All the other varieties winter-killed.

The experiment at the interior stations is not conclusive. The bulbs arrived too late to give good results. They should be planted not later than the last of August if they are expected to form roots before the ground freezes. Further tests should be made at these stations with early plantings.

## GENERAL CULTURAL DIRECTIONS

Bulbs can be successfully grown both in the house and out of doors if they are given the proper care and attention.

Pots or boxes well filled with good soil may be used for indoor cultivation. The bulbs should be covered with soil to a depth of 3 or 4 inches and kept in a dark, frost-free place for about two months to form roots. Holes should be bored in the containers to permit drainage. After seven or eight weeks the containers can be transferred to the living room, where the plants will bloom. By good management the grower can have sweet-scented flowers from February until spring.

For out-door cultivation bulbs should be planted in September in southeastern Alaska and in the latter part of August in the interior. The bulbs should be sorted and each variety kept by itself. They should be set 6 to 8 inches apart in rows 18 inches apart. The bulblets likewise should be sorted and spaced from 5 to 7 inches apart, depending upon size. The larger bulbs are, of course, better, small bulbs often failing to bloom. At the station it is the practice to stretch a line from one end of the bed to the other to mark the rows. Holes 4 or 5 inches deep are then made with a blunt dibble at given distances in the row. The bulbs are set upright in the holes so that the tip will lie 3 or 4 inches below the surface. They are then covered with soil. The method of planting usually followed was slightly modified in the fall of 1926, beds 4 feet wide being raised approximately 5 inches above the surface of the ground. The bulbs were planted 8 inches apart each way in rows across the beds. Raising the beds provides good drainage for the young plants and causes the soil to warm up sooner than it does when level planting is practiced. The Russians who settled in Sitka always raised their garden beds a few inches above the level for all sorts of vegetables, including potatoes. The practice is recommended especially for regions where the rainfall is heavy.

In the interior the beds should be covered with a layer of straw, fine brush, or other litter about 6 inches deep to keep the plants from freezing. The covering helps to hold the snow, which is the best

protector. In southeastern Alaska protection is needed only to prevent the ground from heaving. A layer of seaweed, straw, or fine brush may be used for the purpose. Repeated freezing heaves the surface soil, and in the process lifts the plants and tears their roots. In many instances the plants are found dead on the surface in the spring, with the roots exposed.

Bulb plants make successful border decorations, or they may be planted in little groups here and there, where they will harmonize with the shrubbery. They may also be planted along the sides of the house. The tall-growing kinds should be placed in the background when the dwarf kinds are to be planted in the same bed with them. Tulips, some of which are tall, should be set in the background. Daffodils do not vary greatly in height, but the varieties Paper White and poetaz Elvira should preferably be in front and the varieties Emperor and Empress, which are taller, in the rear.

The blooming period varies with the season and the latitude from the latter part of April to the middle of June. After the plants have bloomed the bulbs should remain undisturbed in the ground until the tops wither. They may then be lifted and dried in the shade and the bulblets separated and classified according to size. Gladiolus bulbs should be lifted every year. The other kinds of bulbs need not be lifted every year. If they are left undisturbed from year to year they will continue to bloom freely. Tulips should be lifted every other year. When the blooming season has passed the ground may be planted with other flowering plants, such as calendulas, zinnias, asters, florist's stock (6 and 10 weeks), and snapdragons. These can be planted regardless of the bulbs in the ground.

## DUTCH METHOD OF PLANTING

The Hollanders have been professional bulb growers for hundreds of years. The method they follow has presumably been developed from long experience. They evidently obtain better results from the bedding system than from planting in rows. Every square foot of land is utilized in the Netherlands, and labor is more abundant and the wages less there than in the United States. At the United States bulb station, Bellingham, Wash., the conventional Dutch method of planting is followed.

Preparatory to planting, the ground is thoroughly spaded or plowed. Beds about 40 inches wide are then laid off. The beds may be of any convenient length, but usually are 50 or more feet long when the bulbs are to be grown on a large scale. The beds are separated from one another by a pathway 12 inches wide. After the land is accurately staked out the soil in the first bed is removed with a shovel to a depth of 4 inches and thrown to one side. The bottom of the bed is smoothed and left even. A homemade marker is used to lay off rows 6 inches apart across the bed. The marker is essentially a rotating cylinder 40 inches in length and of any convenient diameter, with laths set 6 inches apart in the periphery for marking the rows. The bulbs are sorted, selected, and set in the depressions formed by the marker. Usually the work is done by one man on each side of the bed. All bulbs regardless of size are set in rows 6 inches apart. The larger bulbs are spaced 7 to the row, the second

size 9 to the row, the third size 11 to the row, the fourth size 14 to the row, and the fifth size, or the smallest, 21 to the row. In the last-mentioned instance the bulbs may be set in clusters of two or three each to the hole. All bulbs are covered with soil to a depth of 4 inches. As soon as the first bed is planted the second bed is started. The method requires considerable labor, but it has its advantages. Space is economized, the soil is thoroughly pulverized, and the bulbs are uniformly covered and are set at uniform distances so that their place is known before the young plants appear.

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