THE EFFECT OF FERTILIZER TREATMENTS ON THE GROWTH AND FLOWER PRODUCTION OF ANEMONE CORONARIA AND RANUNCULUS ASIATICUS

By

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A C K N O W L E D G E M E N T

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SUMMARY IN ARABIC	

The research work is always needed to attain higher yields and better quality flowers. Actually, no branch of Agriculture is changing more rapidly than is Floriculture.

The supply of the necessary nutrient elements is an important factor in determining successful production. For this reason the effects of nitrogen, phosphorus and potassium as the three major nutrient elements, were studied on the growth and flowering of Ranunculus asiaticus Linn. and Anemone coronaria Linn.

Ranunculus is a perennial herbaceous plant that is used as an annual. It is native to Southeastern Europe, Asia Minor, Syria and Persia (Post 1959). It flowers in the spring in colors and shades of yellow, orange, red, pink, purple and white. The variety Ragionieri used in this research offers the colors mentioned.

Anemones are native to the Mediterranean region. Anemone coronaria varieties are the only ones grown as florist crops (Post 1959). The flowers of the variety St. Brigid used in this work are red, pink, violet, blue and white in color.

[illegible]

Moret ([illegible]) supplied anemone plants with one to two applications of calcium nitrate at [illegible] grams per square meter before flowering. He reported that anemone plants did well on the Morrocan littoral on deep, light, fresh soils well supplied with humus.

Brenchley and Johnstone (1956) reported that the high nitrogen applications for anemone plants should be balanced by sufficient potassium oxide.

Jeff (1957) found that nitrogen had a depressing effect on the total yields of anemone, and a surprisingly low yield was also obtained from two plots receiving potassium only. While in 1958, he showed that plots receiving phosphorus and potassium or potassium alone generally gave the best results. Nitrogen had a depressing effect on yield of anemone except when given in a complete fertilizer. Later in 1959 he reported that dung alone gave higher yields than dung plus nitrogen, phosphorus and potassium or than any combination of nitrogen, phosphorus and potassium. But adequate potassium and a good balance between phosphorus and potassium were important. On soil with a pH below 6, the growth of anemones was severely checked. Top dressing with inorganic nitrogen especially in autumn, depressed the yield of flowers. Jeff (1960) reported that a good balance of phosphorus and potassium showed highest anemone yields, also these results were obtained as a result of supplying dung. In (1961) he found that the value of balanced phosphate and potash manuring was again apparent. There were certain responses to nitrogenous top dressings in mide-August, including better leaf color, longer stems and sometimes higher flower yields of anemone.

Scott (1951) found that the precentage of potassium in sweet potato vines decreased during the period of growth of the fleshy roots. The uptake during the first two months of the season amounted to about 5% of the total. The vine growth accounted for most of the potassium utilization during the third month while accumulation of potassium in the growth of the fleshy roots accounted for practically all of the potassium uptake during the last two months of the season.

Bonnet et al (1951) reported that in an experiment on two acid soils in Peurto Rico, significant yield increases were obtained by treating sweet potato with lime, phosphorus and green manure.

Wong et al [illegible] reported that excesses [illegible] may stunt or kill sweet potato plants either by causing toxicities or by producing nutrient defficiencies.

Sasso (1961) applied ammonium nitrate around the basis of Amulet dahlia plants four times from mid-July to mid-October each application at the rate of 20, 40 or 60 kgs. of nitrogen per hectar. The number of flowers per plant was significantly raised by nitrogen and its lowest rate proved slightly superior to the others. Flower size, stalk length, stalks diameter, average flower weight and tuber weight were not significantly affected.

Mc. Clellan et al (1951) found nitrogen to be the most effective in gladiolus cormels nutrition in the form of ammonium nitrate.

Brewer et al (1954) reported that increasing nitrogen application to gladiolus from 20 to 60 lbs. per acre was accompanied by 20% more florets per spike and 50% increase in the weight of flower spikes. The corm size and weight were also increased. Increasing nitrogen to a rate of 180 lbs. per acre reduced the number of harvested corms.

Woltz (1955) found that the small gladiolus corm required more fertilizers, especially nitrogen, than did large corms. He (1955) also showed that the omission of nitrogen was a factor in reducing the number of floret per spike in gladiolus. In order of decreasing effect magnesium, potassium, phosphorus and calcium defficiencies lowered the average floret count and potassium, magnesium, nitrogen and calcium defficiencies resulted in shorter spikes. Potassium and magnesium appeared to ielay flowering. The weight of the spikes was reduced by the omission of nitrogen, calcium, phosphorus and magnesium in that order. The leaf production was most affected by nitrogen, potassium and phosphorus defficiencies.

Woltz (1956) studied the effect of nitrogen, phosphorus and magnesium on Rosa van Lima gladiolus variety at varying levels of calcium and showed that the flower production was seriously decreased by the high levels of the three elements at the low calcium supply. He (1957) found that when the nitrogen was applied at 160 lbs. per acre, the flower production was increased by increasing potassium oxide from 160 to 320 lbs. per acre. He (1959) showed that in a nitrogen phosphorus potassium experiment, the results were variable in gladiolus but there was a tendency towards lower yields in minus-phosphorus plots. He also (1959) reported that nitrogen was the element most likely to produce a response in gladiolus. It should be applied partly as nitrate, partly as ammonium.

Guttay et al (1957) found that the fertilization rates produced significantly higher yields of gladiolus corms the first season than did the lower rates. During the second season there was little difference in the yield of corms, but all fertilizer treatments increased the weight of flower spike and the number of florets per spike.

Mantrova (1958) reported that the complete fertilizer in the early stages of development depressed growth but became effective after the fifth leaf stage, and the response of plants to nitrogen, phosphorus and potassium improved through out the growth period. Later (1960) he found that nitrogen fertilizers placed in the soil at a depth of 8-10 cms together with phosphorus fertilizers placed at a depth of 25-30 cms had the most favourable effect on the quality and length of life of gladiolus flowers.

Mega et al (1959) found that total nitrogen in the whole gladiolus plants was abundant especially in the period f flower spike elongation and during growth of the new corm, but at flowering time a decrease became noticeable. As regards phosphorus the total amount in the whole plant decreased during the earlier stage of growth, and during the last stage of growth. The fact that potassium occurred in greater a bundance than nitrogen and phosphorus throughout the growing period suggested the desirability of applying greater amounts of potassium than of nitrogen and phosphorus.

Kosugi (1961) noticed with gladiolus in sand that increasing the phosphorus level increased both phosphorus and nitrogen absorption.

The seeds of Ranunculus asiaticus Linn. vr. [illegible]ieri were supplied by the Ferry Morse Seed Company, Mountain View, California, U.S.A. - during August, 1961.
The Anemone coronaria vr. St. Brigid seeds were imported from Rex Pearce Seed Company, Morestown, New Jersey, U.S.A., during August, 1961.

The pots used in all the experiments were 20 cms. in diameter. They were filled with nile silt before planting. The plants were watered daily during the whole period of growth.

First Year Experiments:

Ranunculus asiaticus Linn.

The ranunculus seeds were sown on September 18th, 1961 in propagation boxes. The seedlings were transferred to no.8 pots on October 29th, 1961. On January 9th, 1962 only two plants were kept in each pot. On January 18th, 1962, the two plants with the soil around their roots were placed in a bigger size pot of 20 cms diameter.

The calcium superphosphate fertilizers were added on January 27th, 1962 and the calcium nitrate and potassium sulphate on January 28th, 1962.

Anemone coronaria: (Linn.)

The anemone seeds were sown on September 20th, 1961 in propagation boxes. The seedlings were transferred to the 8 cms pots on November 6th, 1961. Thinning the seedlings was made on January 31st, 1962 to two plants in each pot. The seedlings were placed into the 20-cms. pots on February 4th, 1962.

The calcium superphosphate, potassium sulphate and half the amounts of calcium nitrate were added on February 8th, 1962. The other half of calcium nitrate was added on February 23rd, 1962.

Second Year Experiments:

Ranunculus asiaticus: (Linn.)

Sowing the seeds was on September 18th, 1962 in the propagation boxes. The seedlings were transferred to the 8-cm. pots on November 17th, 1962 and were thinned on December 13th, 1962 to two plants in each pot. They were transferred to the 20-cms. pots on December 25th, 1962. The calcium superphosphate, potassium sulphate and half the quantity of calcium nitrate were added on January 8th, 1963. The other half of calcium intrate was added on January 28th, 1963.

Anemone coronaria:

The seeds were sown on September 18th, 1962 in propagation boxes. The seedlings were transferred to the 8-cm pots on November 18th, 1962.
Thinning the seedlings to two plants in each pot was on December 13th, 1962. They were placed into the no. 20 cms. pots on December 31st, 1962.

The fertilization with calcium superphosphate, potassium sulphate and half the amount of calcium nitrate was on January 15th, 1963. The other half of calcium nitrate was added on February 4th, 1963.

Each treatment plot contained three or four pots and were replicated three times. The randomized block design was used.

Third Year Experiments:

Ranunculus asiaticus: (Linn.)

The seedlings were transferred to the 8-cm . pots on November 22th, 1965 and were thinned on 1st of January, 1966 to two plants in each pot. They were transferred to the 20-cm . pots on January 8th, 1966. The calcium superphosphate, potassium sulphate and half the quantity of calcium nitrate