CALIFORNIA NATIONAL FUCHSIA SOCIETY

Annual Fuchsia Flower and Shade Plant Show, sponsored by the California National Fuchsia Society, will be held Saturday and Sunday, June 18 and 19, in the Long Beach Municipal Auditorium, Long Beach, California. The show will be open to the public from 2 p.m. to 10 p.m. Saturday and from 12 noon to 9 p.m. Sunday. Admission will be $1.00.

Individual garden displays will be exhibited by California National Fuchsia Society's 30 branches, extending as far north as San Luis Obispo, featuring landscaped gardens, outdoor living areas, unique ideas and natural settings. The show will be developed around the theme "Fact or Fantasy".

Garden areas by other cooperating garden clubs will feature related shade plants.

Individual entries are open to the public as well as to society members. These will include hundreds of fuchsias, fuchsia blossoms, begonias, ferns, African violets, gloxinias and bromeliads. Separate classifications will be provided for novices who have not won a ribbon or trophy in any previous show and for experienced amateurs.

Blossoms of fuchsia seedlings for future introduction, as well as recent year's choice introductions, will be on exhibit by some of California's most prominent hybridizers.

Hundreds and hundreds of fuchsia blossoms, each variety displaying its proper name and growing habits, will be on exhibit to the viewing public.

Additional displays will feature the latest in garden equipment and material for gardeners. The Southland's most prominent shade plant horticulturists and TV and radio garden personalities will be at the show to give individual advise on garden problems.

Grand introduction of the show will take place Saturday at 2 p.m. when Miss Fuchsia Queen of 1960 will cut the ribbon, thus ushering in the opening of the show officially.

Miss Fuchsia of 1960 will be officially crowned Saturday evening by Miss Betsie Gayle Davis of Inglewood, last year's queen. Thereafter the Fuchsia Queen of 1960, assisted by her two princesses, will award over 50 trophies to winners in the various classifications.

California National Fuchsia Society is a non-profit organization with a zest to stimulate interest in and the culture of fuchsias and other shade plants, and is probably the largest shade plant society of today.

HORTICULTURE

Plant Nutrients and Manures

How the Various Elements Affect Growth

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Dr. Jacks, a widely known soil scientist, has prepared for the readers of *The New Zealand Gardener* a series of articles on the role of fertilizers and other nutrients in plant nutrition . . . these articles . . . provide the scientific explanation for the reactions of plants to the various fertilizers and manures.

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NO FERTILIZER recommendation can be made generally valid, as crops for which they are made are grown under different conditions, which make fertilizer treatments subject to study of soil, climatic and crop factors over a considerable period. Only then can recommendations be made for a definite soil type and district.

To obtain favorable responses to fertilizer treatment the grower must pay attention to the following:

1. Improvement of soil physical conditions (aeration, drainage, soil structure, water holding capacity) by sound methods of cultivation and by maintenance of organic matter, i.e. either by application of animal residues, compost, mulches, or by growing of green manure crops.

2. Improvement of soil reaction levels and their maintenance to suit the crop.

3. Use of balanced proportions of the main nutrients, and application of adequate amounts to ensure optimum yields under the prevailing conditions. Control of trace element deficiencies.

4. Placement of fertilizers in the most beneficial way, and use of these materials at the right time. Avoidance of materials likely to be injurious to certain crops.

5. Use of good seed of vigorous varieties selected for respective regional conditions.

6. Control of weeds, diseases and pests.

In general, although we discuss individual plant nutrients and their effects on growth, they must be considered in the light of being part of the plant as a unit. They can increase yield when acting in combination with other substances, and can depress yield when applied in excess either by being toxic to the plant or by upsetting the uptake of other elements essential for healthy plant development.

Nitrogen is associated with plant proteins, important growth processes and manufacturing and growth-promoting substances. Its lack affects the size, color and yield of crops and the length of the growing period. In excess it induces luxuriant top growth, but the root system remains ineffective to supply sufficient moisture, especially under conditions of partial drought. Spongy and weak tissues are produced in excess of strengthening tissues, and susceptibilities to the effects of climatic variations and diseases are increased. In addition, ripening is delayed and quality of produce is often depressed. When applied in combination with phosphoric acid and potash, it is instrumental in increasing yield and quality. Plants cannot absorb nitrogen from the air, where it constitutes 78 percent of the atmosphere, but this is utilized by certain groups of micro-organisms. Leguminous plants live in association with certain bacteria which supply them with nitrogen in combined form. These bacteria fix nitrogen from the air and provided soil conditions and nutrient supplies are adequate, may add up to 200 lb. of nitrogen per acre. Small amounts of nitrogen are also washed in by rain.

Nitrogen is not supplied by soil forming minerals but by the soil organic matter. The only soils rich in nitrogen are those amply supplied with organic matter, e.g. peaty soils, their nitrogen content being made available to plants by fermentation processes of soil micro-organisms. In mineral soils, nitrogen supplies are meager and they generally respond to supplementary applications. Plants take up nitrogen in the nitrate and ammonium form (urea, a compound rapidly absorbed by plants is also transformed into ammonium by an enzyme present in plant tissues). In most soils both forms have proved equally effective in plant nutrition and the availability of both forms to plants is sometimes of advantage. Under favorable conditions the ammonium form is rapidly transformed into the nitrate form by the action of micro-organisms. The maintenance of satisfactory reaction levels is important to ensure optimum conditions for the beneficial soil organisims. The ammonium form may, however, be of disadvantage where magnesium deficiency is prevalent, as ammonium restricts the uptake of magnesium, while nitrate promotes it.

Phosphorus plays an important part in the nutrition of soil organisms responsible for the transformation of organic matter, it is instrumental in the utilization of energy by plants and the formation of plant fats, it is an essential constituent of vital cell constituents and of many enzymes. Deficiences are made manifest by poor root development,

small leaves with greenish-red, reddish-brown, purple or bronze color, flowering and ripening are retarded, fruits are small.

Bacteria supplying leguminous plants and through them other plants with nitrogen, can only function when adequately supplied with phosphorous and potash. Adequate supplies should also be given for early growth (seeds or cuttings), as the plant requires a well developed root system for absorption of available soil supplies. Excess effects of phosphorous are highly exceptional. A high phosphate content of plant produce is desirable for the nutrition of man and animals. Soil supplies of this element represent a rather difficult problem. Supplies available to plants are rapidly converted into unavailable forms, especially in acid soils.

Added amounts are normally utilized by plants during the first year, a large part of additions being locked up by soil processes. By placement of phosphate in bands the locking-up process can be delayed, plants are able to use larger proportions of additions as these are exposed to lower amounts of soil than occurs under normal conditions of applications. In soils with high fixing power it is of advantage to use less easily soluble materials, e.g. serpentine super.

A proportion of soil phosphorus exists in organic combinations and becomes available to plants when organic matter is decomposed. Apart from supplying phosphorus to plants, organic matter is instrumental in delaying fixation, and mobilizing supplies from mineral matter. Unlike nitrogen, which in the nitrate form is rapidly leached out of the soil, phosphorus is not subject to leaching. Topsoil removal by surface erosion is the greatest cause of losses. Soils to which regular additions of phosphate have been made can thus be enriched to an extent of allowing reduction of applications after certain levels have been attained.

Potassium is taken up by plants in very large amounts. It is very mobile in the plant and accumulates where growth processes are most active. Deficiency symptoms are mostly discernible in older leaves. It acts on the vascular mechanism of plants, reducing the tendency to wilting, promotes the uptake and assimilation of energy giving carbondioxide from the air, the formation of sugars, fats and proteins, etc. It is corrective against excess nitrogen, contributing to hardening of supporting tissues bringing about resistance to lodging, and better quality fibre in plants grown for production of this material. It also gives better keeping qualities to fruit, and increases the resistance of plants to disease. An excess of potassium uptake may cause thick skin and delayed ripening of citrus fruit, and in all crops reduce the absorption of magnesium, thus accentuating any deficiency of this element. Potassium present in soil minerals becomes available to plants on weathering. Additions of potassium to the soil may to some extent be fixed by soil complexes and become unavailable to plants. Light soils are particularly poor in this element and small and frequent applications should be made to reduce leaching losses. Leaching losses in heavy soils are small owing to locking up processes. In soils high in lime content potassium deficiency may occur owing to antagonistic effects of these two elements. Deficiency is revealed by yellowing of tips and margins of older leaves, which may extend to the center and base of leaves. Yellow parts of leaves turn reddish-brown or brownish-grey and die off later. The rest of the leaf remains healthy and green. Deficiency symptoms may be particularly marked during drought periods.

To be continued

LASCA CALENDAR

Iris Society Flower Show—April 30 and May 1, 1960, Arboretum.

Arboretum District Flower Show—May 7 and 8, 1960, Arboretum