

RELATION OF CHLORINE CONTENT TO TIP BURN OF AVOCADO LEAVES

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In order to avoid low temperatures the plantings of avocado trees have been located largely on slopes in close proximity to the ocean. In eliminating the hazards of frosts, unfavorable soil conditions frequently are encountered. On slopes the soil may be very shallow and may show extensive outcroppings of limestone. The irrigation water may contain considerable chlorine or sulphate, which when absorbed may bring about burning of the leaves. The strong ocean winds may also play a part in drawing up into the leaves large amounts of chlorine or sulphate, by the withdrawal of water from the leaves, the salt residues being left behind to accumulate in the leaves.

The avocado requires a continual supply of moisture and when the soil solution contains too low an amount of nitrate, the chlorine which otherwise might not be present in excessive amount, may be taken up in too large an amount and bring about tip burn. Adequate fertilization with nitrogen may reduce the burning of the leaves by the ability of the trees to put out new growth and dilute the concentration of the chlorine within the tissues of the plant by spreading the chlorine over a greater volume of growth. However, if the chlorine supply is excessive the effects on the trees may be so severe as to make the trees unable to make use of the increased nitrogen.

When irrigation water is fairly low in chlorine content but the subsoil is impervious and does not permit the salts to drain into the deeper layers of soil, the chlorine may concentrate in such soils to such an extent that when coupled with a lack of fertilization the leaves may be burned from excessive concentrations of chlorine.

A lack of available soil moisture may bring about burning of avocado leaves but even when a sufficient moisture supply is maintained, burning of the leaves has resulted. The writer has analyzed samples of leaves from various localities where the leaves were found to be severely burned even under the best cultural operations and has found that the burned leaves showed excessive concentrations of chlorine or sulphate.

The percentage of total chlorine in the dry matter of normal mature avocado leaves varied from 0.09-0.33 per cent. Avocado leaves showing tip burn contained from 0.54-1.21 per cent of total chlorine in the dry matter, most burned leaves containing approximately 1.00 per cent.

When the burned leaves fall from the trees, the branches and young twigs are very liable to sunburn. The new leaves may not attain the full size of the previous leaves that

have fallen and in time such premature leaf shedding may result in extremely small unthrifty leaves. As the new leaves are produced, the appearance of the trees is very misleading, in that they give false assurance that they are recovering and will not burn subsequently, when as a matter of fact as the summer advances the chlorine continues to accumulate and when sufficient has accumulated in the leaves, the tip burn again makes its appearance with its accompanying disappointments. When tip burn occurs there is every reason to suspect its recurrence year after year unless the chlorine is leached down away from the roots and an adequate nitrogen supply is made available.