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Lemon Fruit Loss in Kitchen Garden: Causes and Remedies

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Lemon fruit loss is a complex phenomenon which may occur due to combination of factors. Optimal growing conditions including reasonable cultural practices, sufficient and frequent water supply, incorporation of mulch, timely mineral nutrition (soil supplies and foliar sprays) with smaller split doses of a proprietary mix (FYM, inorganic fertilizer and biofertilizer) and plant protection measures along selection of appropriate location for planting can significantly reduce the dramatic loss of lemon fruits in kitchen garden.

Introduction

Lemon is quite popularly grown in the northern plains of India comprising the states of Punjab, Haryana and Uttranchal where lemon has gained the importance as kitchen garden fruit. Lemon is a leading acid citrus fruit because of its very appealing colour, odour, flavour and its wider utilization than any other citrus fruit. In India, fresh fruits of lemons are primarily used for cooling effects in summers. Lemon juice is widely used in the preparation of soft drinks and possesses special dietic and medicinal values, associated with its high vitamin C content. Lemon is also used for making pickles, squash, jam, jellies, and marmalades. Lemon has characterization of bearing fruit in many flushes making its availability throughout the year but simultaneously, lemon is confronted with a very serious problem of premature shedding and fruit splitting. Some matters are more disappointing to the kitchen gardener than spending time and sweat throughout a full growing season only to end up with meager yields or less than perfect outcomes from the fruit trees. One of the most infuriating setbacks experienced by the kitchen gardener is when lemon trees so often fail to produce an acceptable crop of fruit, even though blossom has been bountiful and the initial fruit set is markedly normal. Two general major causes for this are that fruits shed prematurely or they split simultaneously. These are abiotic disorders which stems from environmental and cultural conditions. The common cause for these physiological conditions is plant stress. Various management strategies are recommended to combat both disorders.

Premature Shedding

The problem of premature shedding is a chronic one that is difficult to prevent. Normally about 98 per cent of the fruitlets that originally set on lemon trees shed till reaching maturity. Most of this drop or loss of fruitlets occurs at the end of flowering or shortly afterwards when the fruit is about pea sized. A second fall, known as the ‘midsummer’ drop usually determines what the ultimate production of fruit will be. The fruit is then usually 2 to 2.5 cm in diameter. Trees growing in the

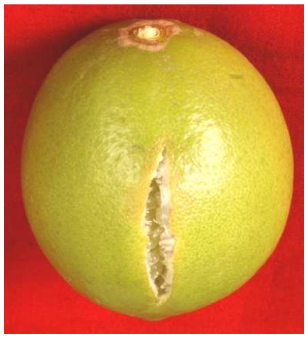
dry soils of kitchen garden often suffer a very severe midsummer drop. At this time of the year quickly intensifying temperatures and desiccating winds strengthen the fall with the result that despite usually satisfactory care and noticeable good health, the tree is practically unfruitful. The remaining 1 to 2 per cent is sufficient to produce a commercial crop of fruit.

Fruit Splitting

Lemon fruit splitting may start as early as mid summer, but most of it coincides with rainy season. The split usually starts at the blossom end of the fruit, which is the weakest point in the rind. The split may be short and shallow or it may be deep and wide, exposing the segments of the juice vesicles. Young trees are more prone to fruit splitting than older trees. Splits probably occur when water is transported from the roots of the tree and sugars are translocated to the ripening fruit, and the rind is unable to expand quickly enough to accommodate the added volume. The rind bursts open under the pressure. Rinds that have been sunburned or otherwise damaged may be less elastic than normal and therefore more apt to split.

Splitting is a long lasting problem in most gardens where lemons are grown. The number of fruits affected by this malady varies from year to year. Although the exact cause is unknown, fruit splitting is likely the result of stress to the tree. Splitting appears to be most closely related to extreme fluctuations in temperature, humidity, soil moisture and fertilizer levels. It is thought that the trouble is caused by a combination of these factors rather than by a single cause. Splitting is usually observed when growing conditions become erratic such as under water stress, uneven fertilizer supply, temperature fluctuations like hot and cold nights, and sudden rainfalls.


Fruitlet shedding stage


Early symptoms of fruit splitting


Mature cracked fruit


Cracked fruit on tree

How to Overcome the Problem

There is no specific remedy to completely overcome this premature shedding and fruit splitting, but heavy losses can be reduced by extra attention before and during the critical periods. Reasonable cultural practices should aim to supply optimal growing conditions. Trees should always have access to sufficient water and nutrients. Also plant protection measures against insect pests and diseases should be taken. Location of tree is also pre-requisite to avoid this loss. Thus, in a garden, a number of factors should be taken care of.

Moisture management: Supply enough irrigation to ensure a continuous supply of soil moisture. Under normal conditions apply moisture frequently during summers to avoid drought. Make sure that more water is supplied if conditions are unseasonably too hot accompanied by windy weather. When hot winds are anticipated, irrigate before the winds begin. After the hot winds subside,

irrigate lightly for a few days and then resume a normal irrigation schedule. Also, mulches – natural and artificial, can be used advantageously for retaining soil moisture by reducing evaporation losses. FYM can be used as natural mulch apart from being used as organic manure. Black polythene sheet can be used as artificial mulch.

Fertilizer management: Use compost and slow release fertilisers to feed the tree. This will stop sudden spurts of nutrients. Instead of a single large application of quick release fertilizer each year, smaller split doses throughout the growing season may help to keep nutrient levels constants. Timed release fertilizers offer the convenience of supplying nutrients at an even rate over the length of the growing season. Citrus trees use comparatively large quantities of nitrogen. During active spring growth, shortages of this important element can retard the tree and accentuate fruit fall. Make sure soil supplies are replenished and also the tree has enough trace elements. If the tree looks deficient in trace elements, apply a foliage spray. The most receptive time to apply nutritional sprays (Borax and K_2SO_4) is following a flush of new growth. This can also be accompanied by spray of growth regulator like NAA. Use a proprietary mix including organic manure, inorganic fertilizer and biofertilizer which will be most judicious fertilizer application practice.

Varieties: Young trees or dwarf varieties with relatively small and shallow root systems may be more susceptible to fruit splitting. Some varieties are more susceptible to splitting than others, so select stocks that resist splitting.

Plant protection measures: Damaged fruit should be removed and discarded, since they are susceptible to invading organisms that may cause disease such as Alternaria rot. Decaying fruit may also harbour fungi, bacteria, insects or other unwanted pests. As well as being wasteful, the splitting creates a good breeding ground for insect pests. Parasitic insects, particularly the black citrus aphid which is active while the fruit is still small and vulnerable, directly contribute to excessive shedding of fruit. Observe trees carefully, and control aphids if necessary.

Location: The position of the tree in the garden is often responsible for excessive fruit fall. If possible, while planting new trees, avoid windy and shaded situations, and possible competition from adjacent trees and plants. Lawn, particularly, should be kept well away from fruiting trees by shallow hoeing or by applying suitable safe weedicides. If lawn is allowed to compete with the tree, extra water should be applied to ensure the tree's needs are met. Deep digging around citrus trees should be avoided as it causes considerable damage to their relatively shallow roots.

Conclusion

The inference can be drawn that efficient management of nutrients and water is essential to have targeted quality of lemon fruits. Thus, multiple applications consisting of proper water management, good fertilizer programme and good preventive spray programme are necessary to reduce lemon fruit loss in kitchen garden.