



## STOLLER ENTERPRISES, INC.

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Bud formation in Trees and Vines - Page 1 of 3

### **Bud Formation in Trees and Vines**

The viability of bud development and strength of flower development on any tree and vine is affected by the activity of the crop during the previous season when the bud primordia is first formed. Any tree or vine that has a heavy cropping will normally have weaker buds and poor pollinating flowers for the next season. This results in a lower yield. Also, if the tree or vine is under severe stress the previous season, the bud primordia and bud strength as well as flower pollination for the next season's crop is generally poor. If one leaves fruit on the tree too long, the bud primordia and strength of the flower pollination the next season is weaker.

It appears that a heavy fruited tree or vine will have restricted shoot growth. This means that the competition of the fruit for photosynthates is greater than the competition of the apical growth points. One could therefore conclude that the amount of IAA and Gibberellic acid in a developing fruit (in total) is greater than that which is developed in the apical meristem tissue. This is why shoot growth is restricted on heavily fruited crops.

On the other hand, when the fruit load is light, it does not favorably compete with the IAA and GA that is being developed in the apical tissue. Therefore, the shoot growth is much greater when there is a light crop on the tree or vine. This can also be promoted by the liberal use of nitrogen.

On most trees and vines, the bud primordia are being formed in the new woody tissue. It is on the second year tissue that the greatest amount of fruit occurs. Therefore, the new tissue and the new bud primordia have less IAA and GA in order to draw photosynthates from the mature leaves on the tree or vine.

From the above analysis, it would appear that some bud primordia are aborted. But more importantly, the bud primordia, which survives tends to be weaker. This restricts vigorous bud development. In turn, it restricts the viability of the flowers and the pollen.

The above can be seen as one observes the tree or vine. When the bud primordia from the previous year's crop is weakened, the bud formation period and the flower formation period is extended. This is true for any tree or vine, which has been weakened, or under stress for any reason. This is particularly true for a tree or vine that is in the process of decline.



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### **If the above is true, one could attack this problem from one of two directions:**

1. Foliar spray IAA and GA (**Calcium 5 S**) on the terminal growth of any tree or vine that is heavily fruited. This would encourage more photosynthate movement to the apical tissue and also the new bud primordia. This may delay the sizing and maturity of the fruit that is on the tree. It would, however, create stronger bud primordia for the next season's crop. This would also greatly increase the viability of the flowers and the pollination, which occurs during that period. It would also increase the young fruit let's ability to have normal cell division.
2. When the buds begin forming during the next season, one could spray an Auxins containing compound (**Calcium 5 S**) liberally on the buds that are being formed. This would increase the bud vitality and its ability to initiate cell division, even though it has been weakened from the previous season. The strength of pollen formation and the flower could perhaps be related to Cytokinin unavailability for normal cell division after pollination occurs.

One could then spray **LOAD** approximately 2 weeks before flowering on the buds that have been first treated with the Auxins containing compound (**Calcium 5 S**).

In addition to promote normal cell division, one could spray a Cytokinin product (**Calcium 5 X**) on the young fruit lets when they are between 2 mm and 7 mm in diameter.

Wherever bud primordia are healthy from the previous season, the spraying of new buds, flowers, and young fruit lets would not be as necessary as if these primordia were weakened during the previous season during the period of their initiation.

The problem of alternate year bearing, and the fruitfulness of any tree or vine for fruit selection, is always affected by the viability of the primordia from the previous season's crop. The above 2 methods can be used in order to strengthen the buds, flowers, the ability to pollinate, and also the cell division of the young fruit let.

The cell division of the young fruit let will determine the ability of that fruit to avoid any physiological disorder during the period of cell sizing.



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Although this has not been studied in detail, we do know that an Auxins spray will always increase the viability of the buds and the flowers. Therefore, one could only assume that the buds from the previous season do not have sufficient Auxins for normal cell initiation. This will vary by degree. A heavy fruit load or fruit load that maintains on the plant for a long period of time, or other stress, will inhibit the bud primordia from having adequate Auxins and/or Cytokinin for next year's buds.

The above may be even as simple as the build up of ABA in the bud primordia for next year's crop. The ABA level may be so high that it decreases the ability of new cell division in both the bud and flowers. As we know for any seed crop, the addition of IAA and/or GA will reverse this direction in order to overcome the stored amount of ABA that will be in any organ of any seed. This would be a very plausible explanation of why buds and flowers have such weakness from the primordia that developed under stressful conditions of the previous season's crop. The primordia are driven into a pre-dormancy due to the build up of ABA. Or, one could consider this a lack of IAA and GA. ABA build up will always follow.

As can be seen from above, the bud primordia must be treated in the same manner as the seed for which one desires greater germination and vigor. We know by experience that the addition of Stimulate and/or Cytokinin will reverse the ABA in the stored seed and cause the seed to germinate with greater speed and viability.