Cytokinin the "RIGHT HAND" helping IAA regulate plant growth.

Cytokinin is an important hormone working with IAA. Cytokinin can be regarded as the "RIGHT HAND" helping IAA regulate plant growth.

So, if Cytokinin is the "right hand" of IAA, where is it produced? It is produced primarily right in the brain of the plant, in the root tip! IAA, the "TOP BOSS" in plant growth needs critical control of Cytokinin production right where decisions are made. That is why it is primarily produced in the brain, the root tip. Cytokinins can also be produced early in the development of key tissues such as the ear in corn. It along with IAA is instrumental in active development of the crop.

Why does IAA need critical control of the level of Cytokinin? This happens because the ratio of IAA/Cytokinin is the "KEY" to whether the plant produces more root growth or more shoot growth. Together, IAA and Cytokinin promote cell division and also cell growth.

Plant growth, or more specifically shoot or root growth or for that matter any part of the plant, depends on a critical ratio of IAA/Cytokinin. For example, with a high ratio of IAA/Cytokinin the plant has more root growth. A low IAA/Cytokinin ratio and the plant has more shoot growth.

Why is this decision of the amount of IAA/Cytokinin decided in the brain, the root tip of the plant. Let us go back to IAA, the "TOP BOSS" in plant growth. IAA is primarily made in the meristematic tissue of the shoot, the tip. Then it is transported all the way down the plant and eventually some of it gets to the root tip. In the meantime, a lot of the IAA is used along the way. It has to look after encouraging sugar production, sugar movement from the leaves to other parts of the plant and sugar movement to the buds, then flowers and fruit of the plant and a whole host of other plant machinery. After doing all of these "duties", there is a lot less IAA in the root than there was initially in the shoot tip, in fact there may be 1,000 times more IAA in the shoot tip than in the root tip! The IAA was "used up" along its transport down the plant. But, what IAA is left over after all those "jobs" that had to be done is the key amount of IAA that determines the IAA/Cytokinin ratio, the amount of Cytokinin that the root tip senses it needs to

produce and give the kind of growth that the plant requires. Thus the amount of Cytokinin that is required for the "perceived" need of the plant is produced in the root.

But we can change the "perceived" need and encourage the crop plant to produce better than it would under whatever stress to which it is subjected. For example, if there is too much rain, then apply X-Cyte. Under "too much water stress" the plant may perceive a need to senesce, to die. It will hurry up to complete seed production, even it is just barely enough to make the next generation survive. But, our knowledge of the hormones lets us "resurrect" the plant. We can "turn the plant around" with Cytokinin! Cytokinin is good at making new shoot growth, new vegetative growth. Anytime in the growth of the crop when we need more vegetative growth Cytokinin is the helper. And every time new shoot growth is made, there is more IAA made in the shoot tip. We made the plant renew itself!

We know that Cytokinin retards senescence (tendency towards life cycle completion or death) of the crop plant. We think it counteracts the senescing effect of stress ethylene and ABA (abscisic acid). We know that cytokinin acts like an anti-oxidant.
We know Cytokinin stimulates shoot growth. The new shoot growth is a desirable shoot growth with large leaves and lateral branching. We know Cytokinin stimulates active root growth. This is especially important at the time of flowering and later when root growth normally is strongly reduced. We still have a lot more to learn though!
Our work together will enhance our knowledge of how to use this hormone as well as others.

It is our knowledge of how to control the plant with hormones that really makes a difference in crop production. It is with Stoller products that we have the control of crop growth that allows the grower to enhance the part of the plant that gives an economic return. It is that control that returns larger profits to the grower.

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