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A NEW PARADIGM FOR CROP PRODUCTION

Most agronomists are taught about the chemical process of manufacturing photosynthates (PS). The plants breathe in carbon dioxide (for sugar formation). The roots absorb water (the solvent for chemical reaction). Chlorophyll is made in order to use the Sun's energy (for chemical reaction).

ALL other nutrients are used to manufacture biochemicals. The plant becomes a biochemical factory ... making various organic compounds ... including **Hormones**.

The hormones are the directors of the biochemistry. They determine which products are made. They determine the parts of the plant that grows ... roots, branches, leaves, flowers, terminal growth, seed filling, etc.

We can now readily understand that the amount and kind of PS that are produced will depend on:

1. Amount of carbon dioxide
2. Amount of water
3. Amount of ALL nutrients
4. Amount and distribution of hormones.

When plants grow under satisfactory conditions, the production of PS is more normal ... because the hormones are in balance ... not fertilizer.

When stress conditions exist, the heat, dry soil, or flooded soil will unbalance the hormones ... not fertilizers. The production of PS is greatly affected.

➤ There are five hormones

Auxins (IAA)
Cytokinin (CYK)
Ethylene (ETH)
Gibberellic Acid (GA)
Abscisic Acid (ABA)

➤ Each plant organ...

Leaf
Root
Stem
Flower
Seed
Branch



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Has its own natural rhythm of when the various hormones dominate the organ's growth. It is very interesting to watch them work.

IAA directs PS to new organs.

GA is the hormone that determines the amount of PS.

CYK will couple with IAA to start new organs.

ABA unloads PS out of cells and into new cells.

ETH causes more activity of each hormone that is currently dominant in each organ.

The combination of Auxins and Cytokinins determine where leaf buds occur. As the leaf begins to grow, Auxins direct "food flow" from developed leaves into the new leaves. This continues until the new leaf reaches about one-third in size.

After the new leaf obtains this size, Gibberellic acid (GA) becomes the dominate hormone...for cell sizing. At this time, the new leaf is manufacturing its own photosynthates and storing them in their cells.

It now becomes clear that Auxins (IAA) direct the flow of photosynthates into the new tissue (organ). It is GA; however, that determines the rate of flow on photosynthates for cell sizing.

The amount of photosynthates that are produced and stored in leaf cells depend on:

1. General plant nutrition
2. The amount of potassium in the cell to regulate cell wall pH.
3. The amount of polyamines in the cell to regulate cell wall pH.
4. The amount of calcium for strong cell wall formation.

After the leaf reaches its maximum size, it waits for a signal to transfer food from the cells to the developing plant organs.

1. New leaves
2. New roots
3. Seed or storage tissues

There are two hormones that are primarily involved in transferring photosynthates:

1. Auxins (IAA) which signal the direction of food flow.
 - A. Seeds have stronger signal.
 - B. Leaves have next stronger signal.
 - C. Roots have the weakest signal.

One can now understand why roots start to die after seeds appear on the plant...they starve.



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2. Abscissic Acid (ABA) will build up in the leaf in order to weaken cells...increased cell wall permeability so that photosynthates can move out of the cell into the phloem tissue.

Following is the sequence of events that discharge photosynthates from the cells into the phloem tissue (for transport to other organs).

1. K^+ moves out of the cell by a pump...ATP ASE "Mg pumps."
2. H^+ moves into the cell and makes it acid.
3. ABA enters the cell wall so that photosynthates can move out of the cell.

If the ABA level is too high, the leaf will quietly die. This is not good.

For maximum yields, photosynthates discharge should be released over a long period of time...not fast. This is determined by the hormone Cytokinin.

Since Cytokinin is produced in the roots, early dying of leaves depends on new root growth.

Since roots begin to stress after seeds come on the plant, the dying process of leaves will begin during the reproductive phase of any crop.

When a plant undergoes stress, the delicate hormone balance becomes unbalanced. This affects the plant's ability to make PS more than an unbalance of nutrients, due to **Stress**.

The above is a natural cycle. We can extend this cycle and have higher yields, if we understand The Language of the Plant.

CONCEPT 1

The nutrient that makes AUXINS (IAA) is: "P, K, Zn, Mn, B, and Ca".

The nutrient that makes Gibberellic Acid (GA) is: "N, and moisture".

The nutrient that makes Cytokinin (CYK) is: "N".

The nutrient that makes Abscissic Acid (ABA) is: "B, and Mo".

Treatment:

"25 lt Nitro Plus + 150 cc Stimulate" / Acre every 1 to 2 weeks.



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CONCEPT 2

The natural defense mechanism of the plant to both Disease and Insects are plant AUXINS.

During conditions of normal growth plants produce sufficient AUXINS to maintain resistance to disease and insects.

Therefore if the plant can be fed AUXINS in order to maintain high levels in the plant during the conditions that it cannot produce enough AUXINS the plant will be able to maintain its resistance at all times and under all conditions.

Treatment:

“25 lt Nitro Plus + 150 cc Satisfy” / Acre every week.

CONCEPT 3

In order to maintain higher yield you encourage food movement to come from top to the bottom rather than from bottom to the top.

This food movement is triggered by AUXINS and GA.

After flowering the top of the plant make more of these two hormones than the roots of the plant. When these hormones move from the top to the bottom through the phloem tissue they keep buds dormant, they cause abortion of the flowers and small fruit.

If these two hormones move upward through the xylem tissue they cause more flowering, more fruit and better quality fruit.

Action:

Apply these two hormones through the roots in a greater quantity than the top of the plant can produce, so that the hormone gradient is greater from the roots upward than from the top downward. This is extremely important after flowering begins.

Treatment:

“25 lt Nitro Plus + 150 cc Satisfy” / Acre every week.



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The orders:

Concept 1: Free choice feed of hormones.

Concept 3: The control of hormones in the plant.

Concept 2: If we do concept 1 and concept 2 we should be able to control disease and insects.

CONCEPT 4

The cause of tillering (putting up more stems or suckers) (wheat or rice or corn or for young plants like potatoes putting up extra vegetative branches), when young plants grow they make their own CYK and GA in their roots, they need extra AUXINS for cell division, they can only get AUXINS from new growth, the more vigorous the roots are growing the more AUXINS they will demand, therefore vigorously growing roots under young wheat or rice plants will cause the plant to put more tillers so the roots can receive more AUXINS . Vigorously growing roots under young potato plants will cause elongation of stolons in order to cause a new plant for more AUXINS to the roots.

If one wants to stop tillers in any plant, feed it AUXINS “IAA” so that the roots have abundance so they do not have to make new tillers.

Four years of university research shows a treatment on potato seeds with Stimulate (AUXINS) at 20 ounces per ton seed will increase yield an average 15%.

Quote:

The farmer says the biggest thing that influences my crop is weather.

1. It controls the way my plant grows
2. It controls disease problems
3. It controls insect problem
4. It controls physiological disorders of my fruits

End quote

There is only one way to control weather.

“5 gallons Nitro Plus + 6 ounces Satisfy” / Acre every week

This is going to cost? Per acre ÷ 7 days = the result is the cost you have to spend per day to control the weather.



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Usage:

- Fruit trees: two weeks before bud break and you can stop 2 – 3 weeks before harvest.

Finally, we must remove ourselves from the box of looking at every disease, every insect, every soil test, every method of tilling, and every method of nutrient placement, every nutrient, and every combination of the above.

In order to do this, we must build a new box.

In order to build this new box, the materials of construction must consist of a better understanding of The Language Of the Plant plus knowledge of the various plant hormones as well as their activity.

Can you visualize the following?

- A plant that is weather-proofed. It is resistant to all climate changes ... including drought.
- A plant that is resistant to diseases and insects
- A plant that never wilts
- A plant that stays green when grain is ready to harvest. It does not "early die".
- A plant where leaves start dying from the top – down, not from the bottom – up.
- A plant where all seeds and/or pods tend to size at the same time.

All of this sounds impossible because few have seen it. This does not mean, however, that it is not possible. Some have seen it.

If you are interested in both "thinking outside of the box" and also helping "build a new box", please contact me. We have a lot of work to do.

“WE CAN ONLY LEARN BY UNDERSTANDING THE LANGUAGE OF THE PLANT.”

Jerry H. Stoller