

ORGANIC GROWER: RESPONSIBILITIES AND CHALLENGES



CONSULTANCY RESEARCH REGISTRATION MARKETING SUPPORT

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**GROWERS RESEARCH AND INNOVATION NETWORK
(GRIN)**

ORGANIC CERTIFICATION

- Through agencies *viz.* CCOF, Organic Certifiers
- A lot of paperwork
- Time consuming
- Last 3 years records data on crops grown and products use
- Audits / renewals every year
- Consultants for fees
- Expensive



FOOD SAFETY CERTIFICATION/ AUDIT

- Consultants for fees
- Primus or Global Gap
- Very Time consuming
- MRL and E. coli
- Electricity usage
- Equipment maintenance record
- Product used
- A lot of data on safety
- Harvest crew and their data
- Cleaning/ washing
- Audits / renewals
- Expensive



WATER USAGE AND SAMPLING

- California Water Board
- Record water usage every month
- Collect water once
- Time consuming
- Ag Waiver



Pesticide use permit

- Ag County office

CITY AND NEIGHBOURS

- Farms in urban areaFUN??
- Ag Preserve... WOW
- Permitting for every single small thing including container, water tanks and fertilizer tanks etc
- Finding an engineer and time requirement
- Storm water drainage issue
- Noise control



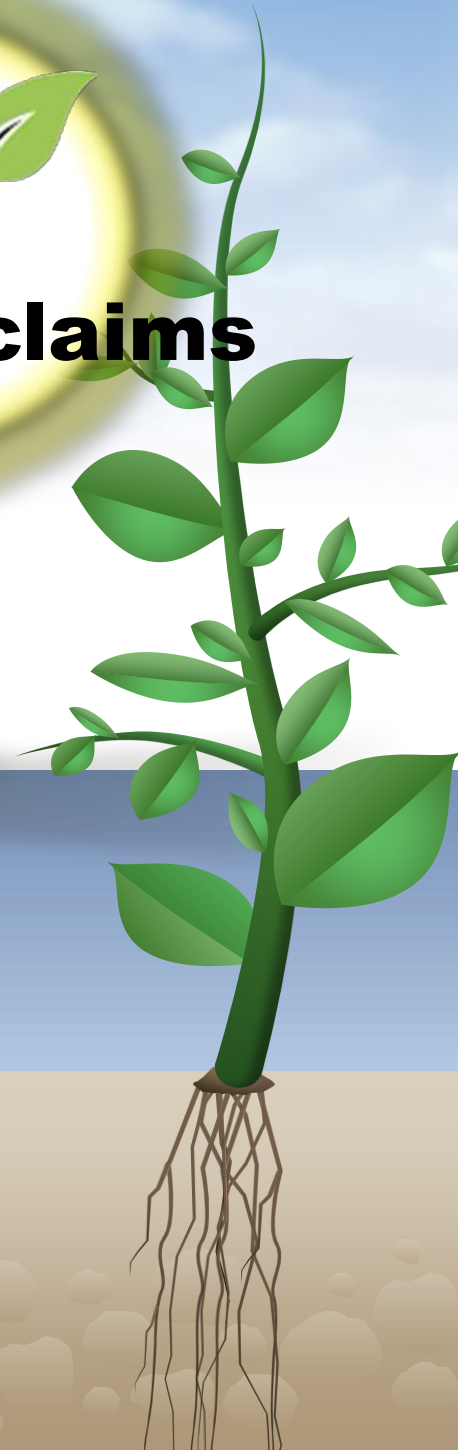
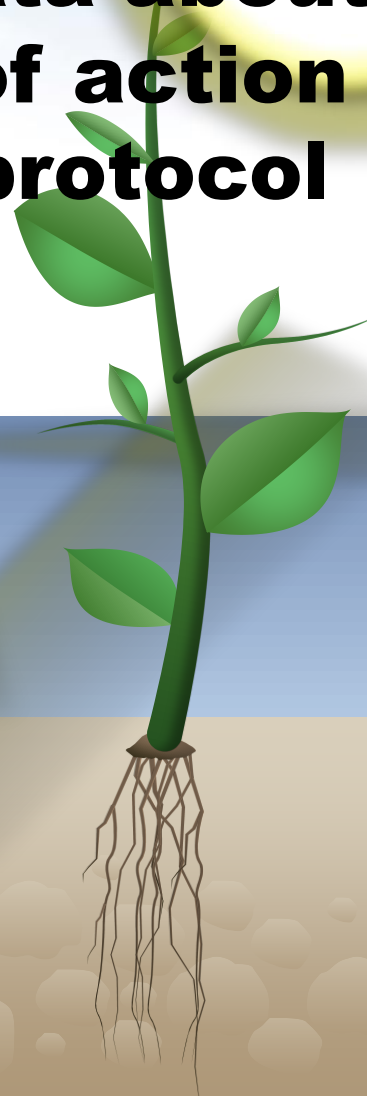
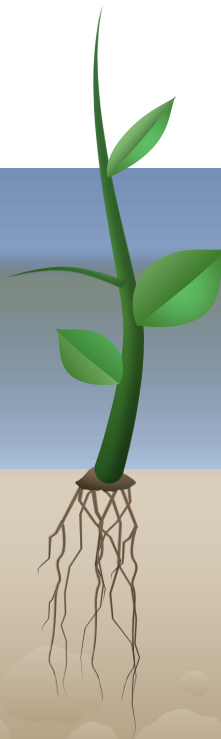
AG INPUT COMPANIES AND SALES

- 1000S of companies has millions of products in market
- 100s of new companies/products come to market every year
- Still growers look for newer products
- Every company claims their product is the best in the category
- Reliability, confusion, correct use data
- Program becomes pricy



General Thoughts : Newer Compounds

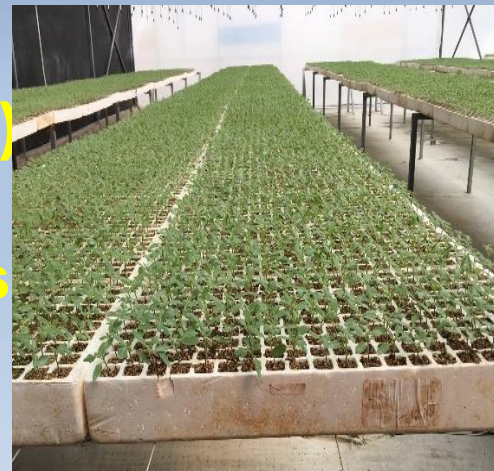
- **Very few of them works**
- **Hit and miss**
- **Do not have enough data about claims**
- **Not sure about mode of action**
- **Need to fine tune the protocol**



WHY



- **Manufacturers mis-prioritize rapid market entry with limited trial data to generate early cash flow**
- **No efficacy data in State where product to be launched**
 - Out of State or foreign country data
 - Different soil type, environmental conditions
- **No data in desired crop**
 - State grown crops
- **No data on claims**
 - Fertilizer reducer-rate reduction study
 - Beneficial microbe enhancer
 - Stress tolerant
- **Unsure about app timing(s)**
 - Crop /stage specific
- **Seen overwhelmed studies**
 - Everything looks alike



BASIC PROTOCOL



Identify: What's purpose of data to be used for

- Proof of concept
 - **Lab/ Greenhouse**
- Registration purpose
 - **RBD/ enough reps**
 - **Multiple rates/app timings**
- Label expansion
 - **Crop specific**
- Marketing
 - **Demonstration / strip with pseudo reps**
- Put enough buffers to avoid edge effect
- Compare with UTC and commercial standards
- Perform best agronomic practices

No such thing: 'All-in-one'



Identify crop specific category



Row crops

Leafy veggies

Fruiting
veggies

Bulbs

Cucs/melons

Berries

Vines

Trees, nuts

Turf and
ornamentals

Hydroponics

'All of above'
??



SMALL PLOTS RBD DESIGN



Demo /STRIP TRIAL TYPE



Large plots

Single row plots

COMMON ERRORS WHILE DEVELOPING PROTOCOLS



- **Choosing right crops**
 - Closer to what its been tested on
- **Application timings**
 - Homework /logic, crop stage
- **Application method**
 - Drip drench, foliar, shank-in, band, soil incorporation etc.
- **Carrier volume**
 - Adjust according to crop
- **Product rates**
 - Fine tune with carrier volume
 - Spray equipment, calibrate
- **Water EC/pH neglected**
- **Stress not induced**
- **Evaluation methods**
 - Meaningful data set
 - Enough replications

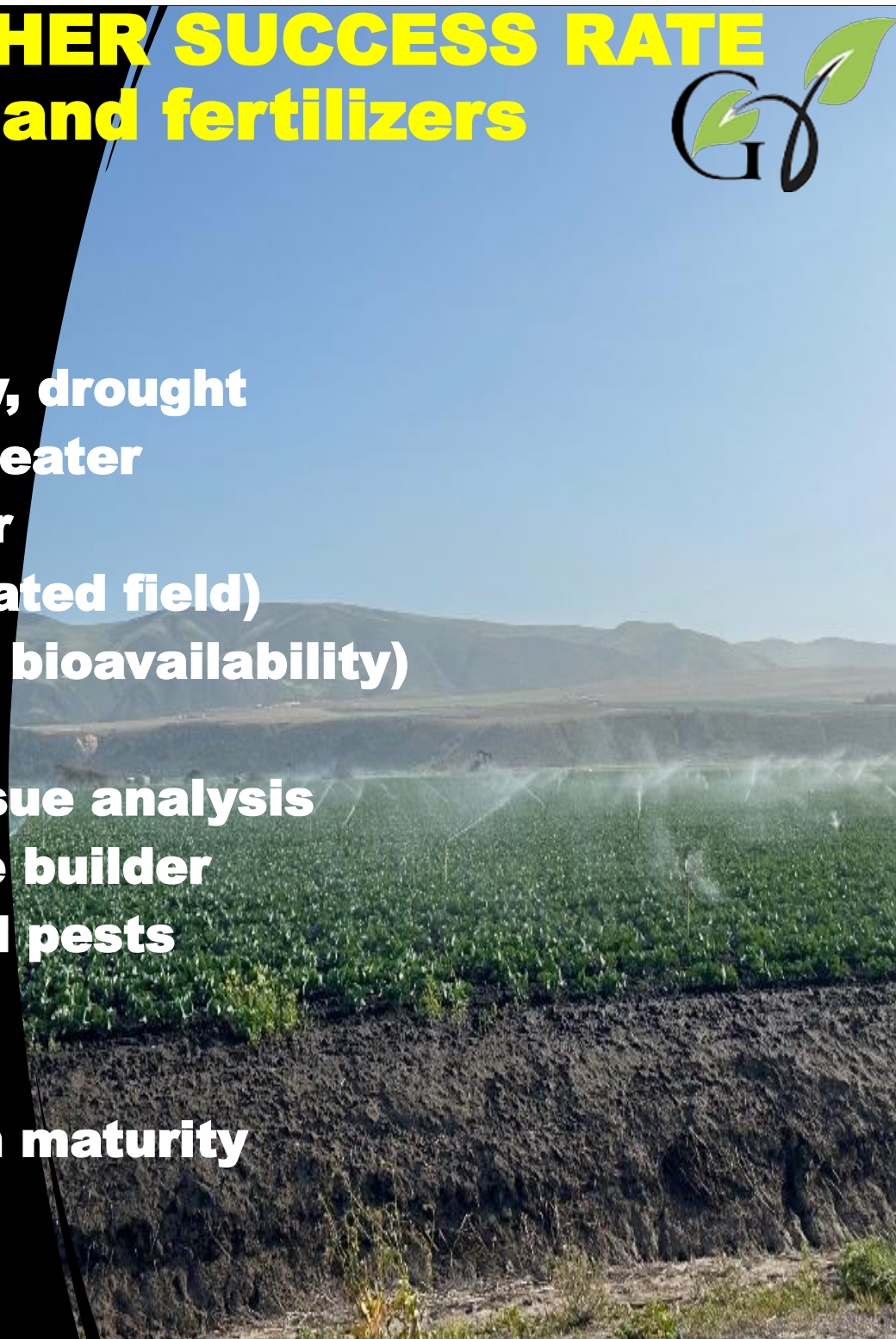


PROTOCOL FOR HIGHER SUCCESS RATE Biostimulants and fertilizers



Identify Target category

- **Stress reducer**
 - Induce : heat/cold/salinity, drought
- **Live microbes: Heavy metals eater**
- **Beneficial microbes enhancer**
 - **Metagenomics (fumigated field)**
- **Fertilizer reducer (increases bioavailability)**
 - Rate reduction studies:**
 - **deficient soil and tissue analysis**
 - Pest and disease tolerance builder**
 - **Evaluate diseases and pests**
 - Soil texture improver**
 - **Soil analysis**
 - Causes Early/Late/ Uniform maturity**
 - **Harvest early**
- **'All of above' ??**



KEY FACTORS

- **Choose Nutrient deficient ground**
- **Induce stress**
 - Lay black mulch (heat)
 - Drought – Use small capacity emitters
 - Inject salt water (Salinity)
 - Use lower end of recommended fertilizer rates as 100%
 - Consider residual soil fertility
- **Use sensitive cultivars**
- **Run trial at correct time point**
- **Mimic grower's application method**
- **Check EC and pH of carrier or irrigation water**



PROTOCOL FOR HIGHER SUCCESS RATE

Fungicides : soil borne /foliar pathogen

- **Use susceptible crop/cultivars**
- **Choose sensitive time of the year**
- **Induce humidity by micro sprinklers**
- **Over irrigate (Soil borne diseases)**
- **Place trial at right location and soil type**
- **Artificial inoculation **AT OWN RESEACH GROUND****
- **Soil sampling for CFU count**
- **Use selective fungicides for maintenance apps**



PROTOCOL FOR HIGHER SUCCESS RATE Insecticides

- Use susceptible crop/cultivars
- Choose sensitive time of the year
- Use little more N
- Place trial at right location
- Artificial inoculation **AT OWN RESEARCH GROUND**
- Use selective insecticides to get rid of beneficials to avoid population crash
- Have bigger subsample size for data collection



WHAT GROWERS EXPECT FROM A PRODUCT



- **Proven data in the neighborhood**
- **Easy storage**
- **Ease of application / tank mix compatibility**
- **Effective**
- **Use in high value cash crops**
- **Yield and quality improvement**
- **Best price to justify ROI**



WHAT DEALERS / DISTRIBUTORS LIKE TO SEE

- **Proven data**
 - Multiple crops
 - Multi-locations
 - Same state
- **Demonstration studies**
 - Large plots at commercial field
 - Strip trials
- **Suitable packaging**
- **Testing with multiple crops**
- **Suitable package and storage**
- **Price to justify ROI**



MARKET DEMAND



- **Stress reducer**
 - heat/cold/salinity, drought
- **Live microbes**
 - Heavy metals eater
 - Nutrient solubilizers
- **Fertilizer reducer (N)**
 - Increases bioavailability
- **Supply enzymes and amino acids**
- **pH reducers**
- **Saline soil/water improver**
- **Best price**



**THANK
YOU**



Disclaimer: All pictures used in this presentation are from GRIN's trials