

APPLICATION RATES - Organic Edible Bean or Green Bean Production Program

Following is some information pertaining to the control of edible bean pathogens and insects. Over and beyond the soil nutrition and the bio-insecticides (see attached material), the Dramm Liquid Fish and microbial packages are the inputs that I work with to aid in the suppression of the plant pathogens and insects. For the foliar feeding of the soybeans, the three key stages that I have been foliar feeding have been the third trifoliage, R1 and R5-6 stages. This may vary on the level of infestation and the region of the valley

Key reason to evaluate bean fields

Foliar feeding-

Insects (aphids, bean leaf beetles and leaf hoppers) are generally the vectors for plant diseases. Foliar for plant health, for suppressing insects and suppressing pathogens and viruses all simultaneously will be very profitable

Pathogenic Suppression options- White mold is the key plant pathogen to address with a biological program. The key input that we add is the Citrex. It is labeled for the suppression of white mold, Pythium, fusarium, verticillium, botrytis and other pathogens. It is an ascorbic acid base biofungicide.

Go to www.CITREX.com for more details

For further pathogenic suppression, biologicals that have been recognized to suppress pathogens include Garlic GP, fish oil, soil microbial extracts and neem oil

Insect Suppression Proposed Foliar applications

Third Trifoliage

Proposed Formula-per acre application

| | |
|-----------|---|
| 1 gal | Dramm E (use to adjust tank mix ph to 5.8-6.4) |
| 1 gal | AER Foundation |
| 1 gal | AER SP1 |
| 8 oz | Neem Blend (must have .05 -.25% in the formula) |
| 2 oz | Citrex – labeled for white mold suppression |
| 2-18 gal | water- |
| optional | Mycotrol O * |
| optional- | soybean aphid control or leaf hoppers |

adding 2-4 oz garlic oil to the formula will reduce the aphid populations as they are moving into the area. Because aphids and leafhoppers identify plants with UV sensors, the garlic oil sprayed on plants will deflect the insects for up to two week

This mix must have a ph of **5.8-6.0** for maximum results. Lower ph will destroy the microbial life of the foliar spray and a higher ph will reduce the uptake of the foliar application in the plant.

The R1 stage (first flower)- Foliar feeding is very beneficial because of the high demand for plant phosphorus. This foliar will maintain or increase the brix levels at this time. The fish hydrolysate (Dramm Fish) will improve the phosphorus demand because of the large amount of phosphorus in the fish formula.

It is critical to set the blossoms of both the edibles and the green beans at this stage. The nutrient formula will also reduce plant stress thereby reduce the abortion of small fruit. For green beans this will maximize yield.

Proposed Formula-per acre application

| | |
|----------|---|
| 1 gal | Drammatic E Fish (use to adjust tank mix ph to 5.8-6.4) |
| 1 gal | AER Foundation |
| 1 gal | AER SP1 |
| 1-3 gal | K Sulfate |
| 8 oz | Neem Blend - (must have .05 -.25% in the formula) |
| 2 oz | Citrex – labeled for white mold suppression |
| 2-18 gal | water- |

optional- soybean aphid control or leaf hoppers
adding 2-4 oz garlic oil to the formula will reduce the aphid populations

Plant Stress at R3 stage (late flower) through pod fill

Plant flowering requires large amounts of phosphorus, any plant phosphorus short fall in the plant will put the plant in stress, lower the brix. This generally is the time that the producers will also witness the buildup of the soybean aphids and leafhoppers. If the growers have used a liquid starter program (a program high in carbon including complex sugars), the aphids will generally be controlled until the later phases of plant development.

R5 to R6 stage (Edible bean pod fill and ripen)

Proposed Formula-per acre application

| | |
|-----------------|--|
| 1 gal | Drammatic E Fish (use to adjust tank mix ph to 5.8-6.4) |
| 1 gal | AER Foundation |
| 1 gal | AER SP1 |
| 1-3 gal | K Sulfate |
| 8 oz | Neem Blend - (must have .05 -.25% in the formula) |
| 2 oz | Citrex – labeled for white mold suppression |
| 2-18 gal | water- |
| | optional- soybean aphid control or leaf hoppers |
| | adding 2-4 oz garlic oil to the formula will reduce the aphid populations |

Foliar Feeding for Bean Leaf Beetle

Foliar OPTION 1- third trifoliage

Many growers have not had the insect pressure in the past to be proactive on the front end. Generally the first sign of insects is when the adult beetles begin feeding on the newly emerging soybeans. This is the prime time to suppress the advance of the beetles. Any larva that are feeding on the plant roots will pupate and emerge in July. It's at this time that quick action must be taken.

Foliar OPTION 2- R1-R3 stage

The emergence of the beetle and the flowering of the soybean plants are simultaneous over that two week period in mid to late July. Without suppression of the beetles both yield loss and bean quality will be a byproduct of the insect pressure.

Neem Blend

The foliar treated leaves will absorb and therefore contain concentration of azadirachtin, the active ingredient in the botanical neem oil for up to 15 days. I have witnessed that the chewing or sucking insects will then be reduced by up to 80% in 4-5 days. The neem oil is a growth regulator. The insects that do survive, generally, will not produce any young or mature. This includes the leaf hopper, alfalfa weevil, bean leaf beetle and aphids. From the good side, the beneficial insects are not eating the plant (herbivores) so they will not be affected

According to Doug Murray, IPM Specialist, Paw Paw, Michigan, the application of Neem oil to the soil at planting will have excellent results to reduce the bean leaf beetle larva population. According to Murray, the systemic levels of the neem will be in the plant for up to two weeks. Any larva that eat on the root nodules or root hairs will ingest the bio-insecticide and suppression them. From the good side, the beneficial insects are not eating the plant (herbivores) so they will not be affected. This insect suppression formula is also **very effectively on grubs, wire worms and cutworm.**

Mycotrol-O*

The addition of the Mycotrol-O to the starter program will inoculate the soil with additional Beauveria Bassiana, a fungi that attacks insects. The unique thing about the Mycotrol O is that it reproduces best in wet r moist conditions. I began using it in combination 6 years ago. The reason for adding it to my insect suppression program is that it is the first bio-insecticide that works better in wet conditions.

These are formulas used by Reg Destree, organic grower and consultant, LaCrosse,WI 608-785-2790

Neem oil, Garlic GP, Citrex and Mycotrol O are EPA registered bio-pesticide