***EVALUATION OF THE* EFFECT OF FOLIAR APPLIED HORMONES TO ABORT YOUNG FRUIT (NAA); TO INCREASE PRODUCTION OF PEPPERS (FOLIAR FEEDING); AND TO CAUSE RED FRUITS TO RIPEN EVENLY AND HARVEST MORE EASILY (ETHEPHON, ABSCISIC ACID), IN BELL PEPPER.**

2015

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INTRODUCTION/OBJECTIVES:

1. Remove young fruits chemically to avoid hand thinning,
2. To cause all remaining fruits to become red at the same time,
3. To cause an abscission layer to form in the peduncle of red peppers,
4. To enhance root development in young transplants,
5. To evaluate foliar feeding with Stoller products.

METHODS AND MATERIALS:

Indobuteric acid was soil drenched shortly after transplanting.

Naphthalene acidic acid, ethephon, foliar nutrients and abscisic acid were applied by hand sprayers.

TREATMENTS:

1. Untreated control
2. NAA
3. IBA
4. Abscisic acid and Ethephon
5. Foliar feeding

Site Location:	Live Oak Ranch, Le Grand, California
Host Crop Variety:	Classic
Plot Description and Size:	Two lines on one row by 10 feet long, replicated 4 times
Experimental Design:	Randomized complete block

Application Conditions:

IBA APPLICATIONS:

Date:	Mar 20, April 9, 2015
Time:	9:00 a.m., 2: p.m.
Wind:	Calm, Lite NW
Sky:	Clear, Clear
Temperature: Date:	66 F, 72 F

FOLIAR FEEDING APPLICATION:

Date:	April 17, 2015
Time:	8:00 a.m.
Wind:	Calm
Sky:	Clear
Temperature:	78 F

NAA APPLICATIONS:

Date:	April 28, May 16, June 5, 2015
Time:	2: p.m., 9: a.m., 1: p.m.
Wind:	NW, Calm, Calm
Sky:	Clear, Cirrus clouds, Clear
Temperature:	72 F, 76 F, 88 F

ABCISIC ACID APPLICATIONS:

Date:	July 7, 2015
Time:	10:00 a.m.
Wind:	Lite WNW
Sky:	Clear
Temperature:	78 F

ETHEPHON APPLICATION:

Date:	July 7, 2015
Time:	10:00 a.m.
Wind:	Lite WNW
Sky:	Clear
Temperature:	78 F

ASSESSMENTS: Pepper yields

RESULTS:

EXPERIMENT # 1- NAA TREATMENTS

Naphthalene Acidic Acid (NAA) applied three times at a rate of 0.11%, appears to have caused the early fruits to abort compared to an untreated control. Table # 1 shows pounds/acre and 40 lb boxes/acre of non-graded peppers for each of three harvests in all four replications as compared to an untreated control.

Table # 1 - NAA treated yields compared to an untreated control.

UNTREATED CONTROL

	Harvest dates					
	June 15		June 26		July 7	
	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac
REP I	25841	646	24482	612	9069	227
REP II	26137	653	24534	613	3624	91
REP III	22216	555	18644	466	6098	152
REP IV	22635	566	13208	330	6098	152
TOTALS	96829	2425	80868	2021	24889	622
					TOTAL BOXES	5068

NAA TREATED

	Harvest dates					
	June 15		June 26		July 7	
	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac
REP I	17512	438	17947	449	13853	346
REP II	18766	469	18244	456	7510	188
REP III	16344	409	19812	495	6865	172
REP IV	15978	399	12685	317	9061	227
TOTALS	68600	1715	68688	1717	37289	932
					TOTAL BOXES	4365

The first harvest (June 15) shows 2425 boxes of peppers/acre for the untreated control and 1715 boxes/acre for the NAA treated plots. There were clearly fewer fruits in the NAA treated plots indicating that some were aborted, and small peppers were noted on the ground. The second harvest (June 26) had similar results with NAA treated plots yielding lower than the untreated control. However, the third harvest (July 7) was reversed with the untreated control yielding 622 boxes and the NAA treatment yielding 932 boxes. Although the NAA treatment had more pounds of peppers they may have been smaller since they were set at a later date.

EXPERIMENT # 2 – IBA TREATMENT

Indolbuteric acid (IBA) treatments to new transplants resulted in improved growth and increased yields in 2014. The same test this year did not provide the same results since the untreated control outyielded the IBA treated plots by 1316 boxes/acre. The reason for the reversal is unclear, but it was noted that the 2015 test did not exhibit the extra height in plants that occurred in 2014. Realizing that this experiment was not requested, the researcher simply wished to verify 2014 results. The University of California system requires positive benefits three years in a row before the data are accepted. Table # 2 shows the results.

Table # 2 - IBA treated yields compared to an untreated control.

UNTREATED CONTROL

	Harvest dates					
	June 15		June 26		July 7	
	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac
REP I	25841	646	24482	612	9069	227
REP II	26137	653	24534	613	3624	91
REP III	22216	555	18644	466	6098	152
REP IV	22635	566	13208	330	6098	152
TOTALS	96829	2425	80868	2021	24889	622
					TOTAL BOXES	5068

IBA TREATED

	Harvest dates					
	June 15		June 26		July 7	
	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac
REP I	17616	440	11012	275	11012	275
REP II	23680	592	7910	198	7911	198
REP III	19367	484	16606	415	8765	219
REP IV	20944	524	2649	66	2649	66
TOTALS	31607	2040	38177	954	30337	758
					TOTAL BOXES	3782

EXPERIMENT # 3 – FOLIAR FEEDING TREATMENT

Substitute, Bioforge, Sugar Mover and More Power were foliarly applied to pepper plants on April 17th. The plants set fruit well and appeared very healthy all season. Table #3 shows that they did not yield as well as the untreated control during the first and second harvests. However, the third harvest yielded 942 boxes compared to 622 boxes for the untreated control. Total boxes for all three harvests were 5230 boxes and 5068 boxes for the foliar fed treatment and the untreated control, respectively.

UNTREATED CONTROL

	Harvest dates					
	June 15		June 26		July 7	
	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac
REP I	25841	646	24482	612	9069	227
REP II	26137	653	24534	613	3624	91
REP III	22216	555	18644	466	6098	152
REP IV	22635	566	13208	330	6098	152
TOTALS	96829	2425	80868	2021	24889	622
					TOTAL BOXES	5068

FOLIAR FEEDING TREATMENT

	Harvest dates					
	June 15		June 26		July 7	
	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac	Lbs/ac	Boxes/ac
REP I	17712	443	18496	462	7475	187
REP II	24203	605	25945	649	17965	449
REP III	28193	705	18313	458	4391	110
REP IV	20700	518	17974	449	7859	196
TOTALS	90808	2270	80728	2018	37690	942
					TOTAL BOXES	5230

ABSCISSIC ACID TRIAL

Abscisic Acid was applied foliarly at a rate of 1.0 gm/l to cause an abscission layer in the peduncle where it attaches to the main stem. The fruits were allowed to turn red and a subjective harvest was conducted. Live Oak Farms personnel, Dominic Giampouli and Mike Marchini were engaged to hand pick peppers and judge any effects that abscisic acid may have had. Knowing that there was little time before the crop had to be shredded, the researcher added 0.1 pt/ac ethephon to hasten ripening.

Subjective results were as follows:

1. Abscisic acid treated peppers separated cleanly between the fruit stem (peduncle) and the main plant, resulting in a full length stem on the fruit. The untreated control peppers resulted in a short fruit stem broken near the calyx. Placing an index finger under the stem usually remedied the problem of a broken peduncle, but the practice was not necessary in the abscisic acid treated plots.

2. Less effort was required to harvest peppers from the abscisic acid plots than the untreated control. Simply lifting the pepper slightly was all that was usually necessary.

CONCLUSIONS:

This year's work provided indications that NAA may be beneficial in removing early fruits, but detailed investigations are needed to determine rates and timings to give best results.

Also, foliar feeding with low analysis N and K, and some micronutrients and hormones gave yields greater than the untreated control. The causative element could be identified and isolated, but these same products have given increased yields in almond, walnut, tomato and cotton in the past few years of testing.

Finally, abscisic acid showed some promise in helping to form an abscision layer in the peduncle of red fruit to enhance ease of harvesting. Again, optimum rates and timings will need to be examined.

March 20, 2015 – Transplanting peppers into test plot field

March 20, 2015 – Applying IBA to new transplants for enhancement of root growth.

March 22, 2015 – Transplanting completed

April 28, 2015 – Application of NAA to abort first fruits

May 16, 2015 – Some small fruit missing

June 5, 2015 – Test in progress

June 15, 2015 – Date of first harvest

June 26, 2015 – Second harvest of peppers

July 7, 2015 – Third harvest and date of abcisic acid application

July 10, 2015 – View of abcision layer between main stem and peduncle

July 10, 2015 – Dominic showing abcision layer

July 10, 2015 – Inspecting peppers at test plots