



Twin"N" on Date Palms

LA QUINTA DATE GROWERS

COMMERCIAL TRIAL

THERMAL PLAZA BLOCK-5

SEASON 2022

By: Hector A Rochin

PROTOCOL

- Thermal, California USA.

I).- Objective:

- Demonstrate the effect and adaptation of Nitrogen-fixing microbes in sandy soils (sandy loam) in the cultivation of Date Palms of the Medjool variety.
- **In the block that is going to be treated with Twin"N" the Nitrogen Units will be reduced by 20% and the untreated will be applied 100% of the required units.**

II).- MATERIALS AND METHODS

- The trial will be conducted at La Quinta Dates Growers (Kohl Ranch Farms) in Block 5 (100% ORGANIC) of the Thermal Plaza Project on a 7-acre tract with approximately 432 Palms approximately 7-10 Ft. Tall. The main problem is the incorporation of Organic Nitrogen since there are not many reliable sources on the market.
- IT WILL TRY TO MEASURE THROUGH THE APPLICATION OF THIS PRODUCT IF THE NITROGEN-FIXING MICROORGANISMS FOR THIS TEST ARE ADAPTED TO THIS REGION AND ARE ABLE TO INCREASE THEIR LEVELS.

- III).- DEMONSTRATION TEST PROTOCOL:
- TREATMENTS:
- Two TwinN applications will be made:
- 1st application in April 2nd week
- 2nd application in May 1st week.
- The product will be injected through the drip irrigation system the second week of April (day 15 or 16 of the present) with a dose of 0.007 Dry Ounces per Acre mixed only with water from the irrigation system. (No other products will be used for this application.)
- The second application will be made the first week of May with a dose equal to the first.

- IV).- PARAMETERS TO BE CONSIDERED IN THE EVALUATION:
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- Nitrogen levels in the soil and foliage of La Palma before and at the end of the applications.
- The first sampling will be carried out with the results obtained in the last volume of the Producer's sample (most recent) and the second at the end of the season.
- Visual measurements will be made that allow us to compare and make observations that denote significant changes in the development of La Palma.



- Yield and Quality: Select sampling sites in the area under treatment and in the control area. At least five sampling sites of two furrows of 10 m long each are suggested for each treatment. In these, the production in number of fruits of each classification by size and in total weight of the Block must be quantified, in the greatest number of pinches possible, ensuring that they are distributed throughout the harvest time (preferably in all). In the end, it will be extrapolated in terms of tons per Acre.
- The data of the treated or control production, of the different sizes, will also be obtained. Or production and quality sampling by size will be carried out, sanctioned by the packaging.
- Photographic shots will be taken of the different stages of the crop in development as well as of the treated and untreated area

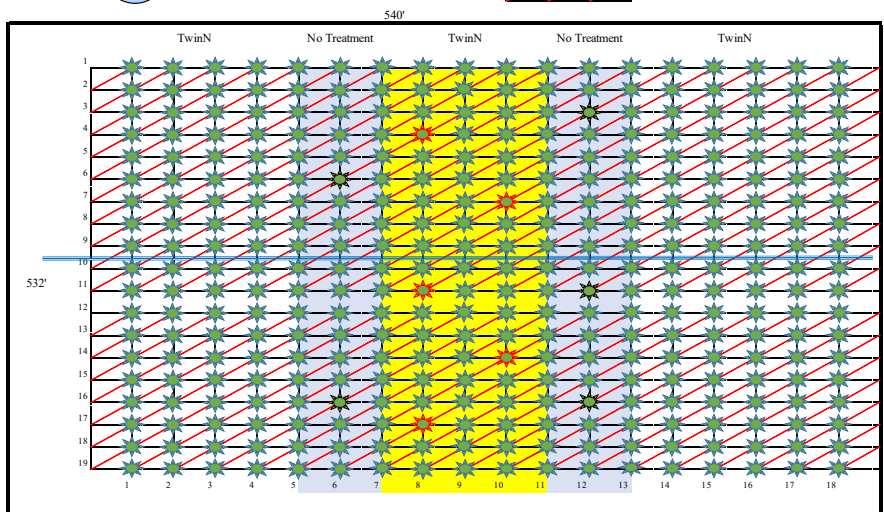




THERMAL PLAZA
BLOCK - 5



ACRES 6.6
LINES 18
TREES 342



No treatment Tree for Sample



TwinN treatment Tree for Sample

THERMAL PLAZA RANCH BLOCK-05

RESULTS AND CONCLUSIONS

- THERMAL PLAZA MEDJOOL SATE PALMS
- In the block that is going to be treated with Twin"N" the Nitrogen Units will be reduced by 20% and the untreated will be applied 100% of the required units.



RESULTS:

- SOIL ANALYSIS:
- INCREASING NITROGEN LEVELS.
- INCREASING ORGANIC MATTER.

SOIL ANALIZYS PER TREATMENT

THERMAL PLAZA TWIN "N" TRIAL ANALITICAL RESULTS										
SOIL TEST RESULTS	(01/21/2022)			1st Applic. (04/27/2022)				2nd Applic. (08/13/2022)		
	GROWER			TREATED	GROWER (Not Treated)			TREATED	GROWER (Not Treated)	
FERTILITY				FERTILITY				FERTILITY		
PARAMETER	RESULTS	UNITS		RESULTS	RESULTS	UNITS		RESULTS	RESULTS	UNITS
EC		mmhos/cm		1.04	0.8	mmhos/cm		3.46	2.54	mmhos/cm
ph				5.9	5.8			8.84	8.10	
Cationic Exchange Capacity (CE)				14.7	11.5	meq/100g		14.5	16.4	meq/100g
PARAMETER	RESULTS	UNITS		RESULTS	RESULTS	UNITS		RESULTS	RESULTS	UNITS
Ammonium Nitrogen				4.4	4.1	ppm		4.4	4.1	ppm
Nitric Nitrogen				7.6	5.6	ppm		40.9	17.2	ppm
Organic Matter				1.18	0.9	ppm		0.82	0.78	ppm
Phosphorus (Olsen)				44	27	ppm		138	119	ppm
Available Calcium	75.7	mg/Lt		2158	1661	ppm		1924	2365	ppm
Available Magnesium	27.4	mg/Lt		233	191	ppm		207	292	ppm
Potassium	5.38	mg/Lt		147	142	ppm		435	448	ppm
Available Sodium	334	mg/Lt		184	138	ppm		572	356	ppm



RESULTS IN TISSUE ANALYSIS:

NITROGEN LEVELS INCREASE

TISSUE ANALYSIS PER TREATMENT

LEAVES TEST RESULTS		(01/21/2022)		(04/27/2022)			(08/13/2022)			
		GROWER		TREATED	GROWER		TREATED	GROWER		
MACRONUTRIENTS										
PARAMETER	RESULTS	UNITS		PARAMETER	RESULTS	UNITS				
NITROGEN	1.09	%		1.22	1.11	%		1.3	1.12	%
Ammonium Nitrogen		mg/Kg				mg/Kg		275	243	mg/Kg
Nitric Nitrogen		mg/Kg				mg/Kg		<113	<113	mg/Kg
POTASSIUM	2.32	%		2.29	2.33	%		2.27	2.44	%
PHOSPORUS	0.2	%		0.153	0.152	%		0.163	0.174	%
CALCIUM	0.24	%		0.2	0.2	%		0.33	0.35	%
MAGNESIUM	0.18	%		0.138	0.139	%		0.183	0.193	%
SULFUR	0.26	%		0.26	0.28	%		0.23	0.22	%
PHYTOTOXIC ELEMENTS										
CHLORINE	1317	mg/Kg		988	974	mg/Kg		1381	1623	mg/Kg
SODIUM	<250	mg/Kg		<250	<250	mg/Kg		<250	<250	mg/Kg
Aluminum								41.8	35.9	mg/Kg

HARVEST RESULTS:

- Increase pounds harvested per tree in 28%



HARVEST REPORT

First Pic (9/06/2022)

Thermal Plaza Block-5	Twin"N"	Trees Harvested	Untreated	Trees Harvested
Field Run/Trays	595	50	358	50
Weight (8 Lb/Tray)	4,760	95.2	2,864	57.28

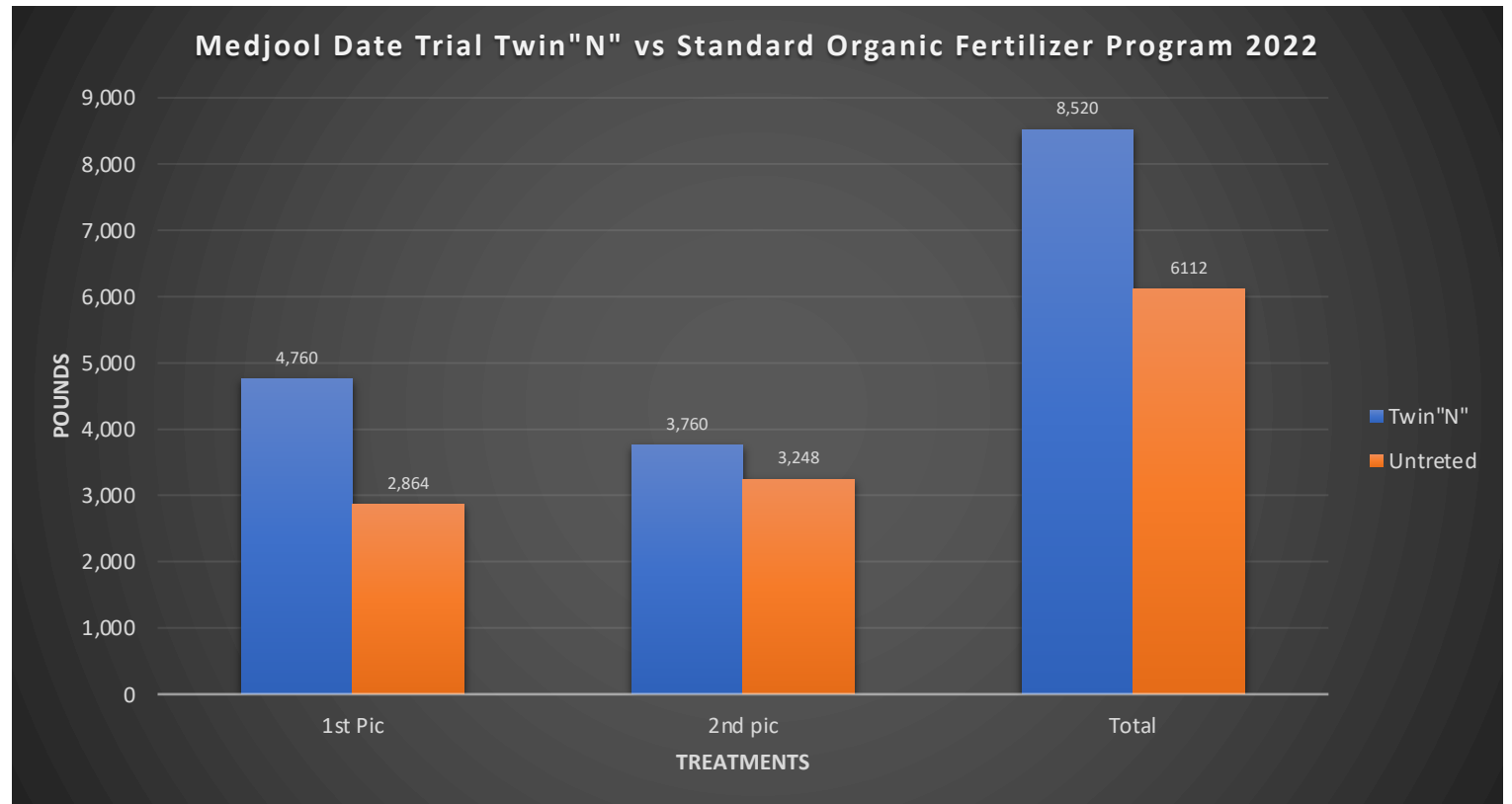
Second Pic (10/112022)

Thermal Plaza Block-5	Twin"N"	Trees Harvested	Untreated	Trees Harvested
Field Run/Trays	470	50	406	50
Weight (8 Lb/Tray)	3,760	75.2	3,248	64.96

Total Harvest in Two Pic's	8,520	50	6,112	50
Weight (8 Lb/Tray)	170	Pounds per tree	122	Pounds per tree

HARVEST REPORT

Thermal Plaza B-05	Total Pounds Harvested per Pic		
Treatments	1st Pic	2nd pic	Total
Twin"N"	4,760	3,760	8,520
Untreated	2,864	3,248	6112



QUALITY RESULTS:

INCREASE

INCREASE THE
WEIGHT PER FRUIT
IN 7.2% IN THE
FIRST PIC.

INCREASE

INCREASE THE
WEIGHT PER FRUIT
IN 28% IN THE 2nd.
Pic.

INCREASE

INCREASE THE
JUMBO SIZE IN
38% (AVG.).

INCREASE

INCREASE THE
LARGE SIZE IN 30%
(AVG.).

A dark blue circle with a white border. Inside the circle, the text "QUALITY HARVEST REPORT" is written in white, uppercase, sans-serif font, stacked in three lines. Below this, "(1ST Report)" is written in a smaller, white, sans-serif font.

QUALITY
HARVEST
REPORT
(1ST Report)

[illegible]

(2nd Report)

[illegible]

QUALITY HARVEST REPORT (3rd Report)

	Untreated (3rd Sample)						Twin"N"			
	10/11/22						9/6/22			
	<u>COUNT</u>	<u>%</u>	<u>GRAMS</u>			<u>SIZE</u>	<u>COUNT</u>	<u>%</u>	<u>GRAMS</u>	
JUMBO	9	9.0	7.48	212		JUMBO	17	17	14.81	420
LARGE	35	35.0	24.23	687		LARGE	51	51	43.25	1226
XFANCY	0	0.0	0.00	0		XFANCY	0	0	0.00	0
FANCY	36	36.0	20.39	578		FANCY	25	25	19.37	549
C-GRADE WET/SOF	0	0.0	0.00	0		C-GRADE WET/SOF	5	5	4.87	138
DRY	1	1.0	0.21	6		DRY	0	0	0.00	0
YELLOW TIP	1	1.0	0.60	17		YELLOW TIP	0	0	0.00	0
50%<(CHOICE)	15	15.0	5.93	168		50%<(CHOICE)	0	0	0.00	0
BRKN/PUFFY	0	0.0	0.00	0		BRKN/PUFFY	0	0	0.00	0
Others (Cull)	3	3	1.658	47		Others (Cull)	2	2	1.48	42
TOTAL	100	100	60.49	1715.00		TOTAL	100	100	83.77	2375
			Pounds	3.78					Pounds	5.23

Cost Investment Comparation:

- Organic Standart Nitrogen Fertilizer Program for Season-2022:
- Standard Organic Nitrogen Program (80 Unit/Tree).
- Twin with 20% N reduction with SONP (64 Unit/Tree).
- Cost per SONP per Tree --- $\$ 33.60 \times 50 \text{ Trees} = \1680.00 per Acre
- Cost per Twin"N" plus SONP per Tree --- $\$ 28.30 \times 50 \text{ Trees} = \1415.00 per Acre.
- Reduction of 16% in SONP (\$ 5.30/Tree less).
- Increase in 48.16 Lbs. per tree more than the SONP.
- Twin"N" increase the production in 28.14%

Cost Investment Comparison: (Cont.)

Nitrogen Unit for Growers secret (14%)	7	\$0.42	80	\$33.60	\$0.00	\$33.60	100%
Twin"N" (2X) with 20% N- Reduction	7	\$0.42	64	\$26.88	\$1.42	\$28.30	84%
						- \$5.30	16%

Cost Investment Comparation: (Cont.)

- Field Run cost per Pound: \$1.65
- SONP Treatment: 6,112 Lb. in 50 Trees harvested (122.44 Lb./Tree).
- Twin"N"+ SONP Treatment: 8,520 Lb. in 50 Trees Harvested (170.4 Lb./Tree).

- **Untreatment: \$202.03/Tree – \$ 10,101.5/Acre**
- **Twin"N" + SONP: \$281.16/Tree. -- \$ 14,058.00/Acre**

- **Benefit \$\$\$ \$ 79.13/Tree -- \$ 3958.00/Acre**

- **Twin"N" cost per Acre \$ 36.00**



UNTREATED



TWIN"N"

Conclusion:
Untreated VS
Twin"N"





EFFECTS OF THE
DISTRIBUTION OF TWIN"N"





EFFECT IN FRUIT AND ROOT ZONE