

Effect of Methanol Treatments on Chile Pepper and Seedless Watermelon Production in Central Arizona, 1993

N. F. Oebker, W. T. Molin and R. Gibson

Introduction

Various claims have been made for the foliar application of methanol on crop plants. Nonomura and Benson (1992) caused a stir in the plant world by announcing their findings of increased yields in watermelon, cotton, tomato, cabbage, and eggplant through the application of methanol on these crops in western Maricopa County, Arizona. A great deal of interest was shown in this report by both scientists and growers worldwide. Some of the proposed benefits for methanol application are: (1) increased yield, (2) higher sugar in fruit, (3) earlier maturity, (4) reduction in water use, (5) improved uptake of nutrients, and (6) control of whitefly.

The purpose of this study was to evaluate methanol treatments on chile peppers and seedless watermelons in central Arizona.

Materials and Methods

Methanol treatments were applied to chile peppers and seedless watermelon in commercial fields located on Sundance Farms, Coolidge, Arizona in the spring of 1993.

Two fields of chile pepper cv. 'Alpha' were used. One was transplanted and the other was direct seeded; both were started in February, 1993. Rows were 40" apart with the ultimate spacing of about 12" between plants. A drip line below the row, about 8" deep, supplied nutrients and water during the season. Methanol treatments were sprayed on the transplanted peppers on 5/14, 5/26, and 6/3 and on the direct seeded on 6/3, 6/10, 6/16, 6/24, and 7/1. Plots were one row 50' long and were replicated 4 times. Only mature green fruits were harvested from 20' of row in each plot. Transplanted peppers were harvested on 6/16 and 6/24 while the direct seeded peppers were harvested only on 7/9.

The seedless watermelons cv. TriX-313 were transplanted in late February, 1993 on 40" beds with drip lines 8" deep. Plants were spaced about 5' apart. A pollinator row was located nearby. Plots were 4 rows 25' long replicated 4 times. Water and fertilizer was applied through the drip. Treatments were made on 5/14, 5/26, and 6/3. Only the first harvest on 6/11 was recorded.

Treatments for the three experiments were:

1. Water (control)
2. Nutrients (1% Urea + .01% Fe chelate) (N)
3. Methanol (30%) (M)
4. Nutrients and Methanol (N&M)

In spraying treatments good coverage of foliage was attempted. Treatments were made with a back-pack sprayer at mid-day when temperatures were as high as 114°F.

To determine if any significance existed between treatments analysis of variance was applied to all data.

Results

In all experiments no effect was observed from any of the treatments. Although differences appeared from plot to plot, no consistent results occurred and were not significantly different when analyzed (Table 1 to 4).

No differences in quality, appearances or color were found.

Conclusion

Under the conditions of these experiments methanol had no effect on chile peppers or seedless watermelons. At this time we do not know of any scientific evidence that supports the commercial use of methanol on crop plants in Arizona.

Literature Cited

Nonomura, A.M. and A.A. Benson 1992. The path of carbon in photosynthesis: improved crop yields with methanol. Proc. Natl. Acad. Sci. USA 89: 9794-9798.

Table 1. Early and total yield of transplanted chile peppers treated with methanol at Sundance Farms, Coolidge, AZ 1993.

Treatment ¹	Average yield/20 ft. plot green fruit (lb)	
	Early ²	Total ³
1. Water	8.7	36.6
2. Nutrients (1% Urea + .01% Fe chelate)	10.5	32.9
3. Methanol (30%) (M)	9.4	38.6
4. Nutrients & Methanol (N&M)	7.0	34.7
Significance	NS	NS

¹Sprayed on plants at midday on 5/14, 5/26, and 6/3, 1993.

²Harvested 6/16, 1993.

³Harvested 6/16 and 6/24, 1993.

Table 2. Yield of direct seeded chile peppers treated with methanol at Sundance Farms, Coolidge, AZ 1993

Treatment ¹	Average yield/20 ft. plot ² green fruit (lb)
1. Water	43.2
2. Nutrients (N) (1% Urea + .01% Fe chelate)	44.8
3. Methanol (30%) (M)	52.6
4. Nutrients & Methanol (N&M)	45.4
Significance	NS

¹Only harvested once -- July 9, 1993.

²Sprayed on plants at midday on June 3, 10, 16, 24, and July 1, 1993.

Table 3. Early yield of seedless watermelon treated with methanol at Sundance Farms, Coolidge, AZ 1993

Treatment ¹	Average yield/20 ft plot ²	
	No. of fruit	Weight (lb)
1. Water	11.0	155.0
2. Nutrients (N) (1% Urea + .01% Fe chelate)	7.5	112.0
3. Methanol (30%) (M)	6.0	88.0
4. Nutrients & Methanol (N&M)	8.8	138.0
Significance	NS	NS

¹Sprayed on plants at midday on May 14 and 16, and June 3, 1993.

²Harvested June 11, 1993.

Table 4. Soluble solids of seedless watermelon fruits from methanol treated plots at Sundance Farms, Coolidge, AZ 1993

Treatment ¹	Soluble solids (%) ²
1. Water	11.2
2. Nutrients (N) (1% Urea + .01% Fe chelate)	11.3
3. Methanol (30%) (M)	10.2
4. Nutrients & Methanol (N&M)	11.4
Significance	NS

¹Sprayed on plants at midday on May 14 and 26, 1993.

²Samples taken from June 11, 1993 harvest.