**Journal of Global Biosciences**
Peer Reviewed, Refereed, Open-Access Journal
**ISSN 2320-1355**
**Volume 9, Number 12, 2020, pp. 8213-8217**
**Online on 06th January, 2021**
**Website: www.mutagens.co.in**
**URL: www.mutagens.co.in/jgb/vol.09/12/091209.pdf**

SCAN ME

*Research Paper*

# EFFECT OF GREEN MIRACLE & SILICON ON SUNBURN OF FLOWERS OF POMEGRANATE [*Punica granatum L.*]

**Rushikesh Khandagale, Vishal Yele and Akshay Deshmukh[1]**

Department of Agrochemicals and Pest Management (AGPM),
Shivaji University Kolhapur - 416004,
[1]Devchand College, Arjunnagar - 591237,
India.

**Abstract**

This study was carried out in order to determine effect of green miracle (market formulation alcohol and fatty acids) and silicon 20% on sun burning, dropping of pomegranate flowers. The experiment conducted 4years old orchard planted at spacing at 13x7 feet. Bahar treatment was given on 24/4/2020 using Ethepon 39% SL after leafs dropped down within 11 to 15 days of bahar treatment the flower emergence started due to high temperature the small emerged flowers going to burn due to high hear water losses ,transpiration some market products were used to overcome transpiration stomatal regulation from that we used the two market formulations Green miracle (market formulation alcohol and fatty acids) and silicon 20% and observations were recorded over the sunburn of flowers, flower dropping and effect on fruit setting.

Key words: Sunburn, Flowers, Pomegranate.

## INTRODUCTION

The consumption of pomegranate fruit has many health benefits [https://nrcpomegranate.icar.gov.in/files/Publication/44.pdf]. India grows six different commercial varieties of the fruit – Ganesh, Mridula, Arakta, Ruby, Phule Bhagwa, and Phule Bhagwa Super. Being home to the finest varieties of pomegranate, the fruits have soft seeds with fewer acids. In fact, the fruit quality is much superior to those grown in Spain and Iran in edible quality and attractiveness. Mainly grown in the western parts of Maharashtra and northwestern Karnataka, followed by Gujarat, Andhra Pradesh, and Tamil Nadu, villages in the districts of Solapur, Nasik, Sangli, Ahmednagar, Pune, and Satara make Maharashtra the country's pomegranate bowl, with 71.21 % of the total

area under pomegranate cultivation in the country. In 2015-16, the area under pomegranate cultivation has sizably increased from 1,31,000 hectares to 1,81,000 hectares, with an annual production of 1.8 million tons and an average productivity of 9.88 ton per hectare, according to the 2015-16 annual report of the Solapur-based National Research Centre for Pomegranate [NRCP] [https://nrcpomegranate.icar.gov.in/files/Publication/42.pdf].

Sunlight is the primary source of energy used in photosynthesis by plants to convert carbon dioxide and water into carbohydrates, which the plant uses to make stems, leaves, roots, and

Fruits. Without this source of energy, life is not possible. Besides, sun light up to certain level is very much helpful to improve quality and production, and also reduces incidence of pest and diseases. If the intensity of sun light is beyond the optimum, plants suffer from many physiological problems and sun burn is one of them. Sunburn injury is common on fruits in due to high solar radiation levels and air temperatures, low relative humidity, and high elevations. Ultraviolet [UV] radiation is greater at higher elevations and is the greatest contributor to damage. Excess absorbed energy is the greatest contributor to cell death and sunburn.

The incidence and severity of sunburn depends upon climatic factor, cultivars, hormonal, nutritional and soil moisture. The damage caused due to sun burning which occurs up to 0.9-19.13% in different varieties. Sunburn occurs mainly where air temperature and the number of sunny hours are high during the ripening period. Sunburn also occurs when cool or mild weather is abruptly followed by hot, sunny weather. Severe sunburn alters the cuticle even more, and damages both the epidermal and sub epidermal tissues. Cell walls get thicker.

Some modern fruit production techniques can increase the risk of sunburn. Rootstock is becoming popular in fruit production and dwarfing rootstocks growing on trellis and using training systems that allows direct sunlight to penetrate throughout the canopy of tree and this can increase fruit yields and improve color development but can increase the risk of sunburn. Fruit production losses due to sunburn may be 6 to30 per cent depending on seasons and the type of fruit. When air temperatures rise above 30 to 35ºC during the day time, photosynthesis is likely to slow which will reduce potential fruit yield. The energy of sunlight can cause damage to the sun-exposed surface of the

fruit. Sunburn is more due to the direct force of the sun than air temperature [https://www.ijcmas.com/abstractview.php?ID=2773&vol=6-6-2017&SNo=131].

## MATERIALS AND METHODS

The experiment was carried out here in Pomegranate Orchard at Sangola, Maharashtra. Orchard are 5 years old having spacing of 13x7 feet. There about total 500 trees. The bahar treatment [Chemical induced stress - Ethepon 39% SL] to this orchard was given on 24/04/2020; these days are having full day sunlight with higher intensity of solar radiation. The temperature during this treatment was around 42$^{o}$C [https://www.accuweather.com/en/in/solapur/204849/april-weather/204849].

Defoliation occurs and after 8 to 10 days new leaves sprouting begins, Further after 15 to 20 days initiation of new flowers bud begins, but due to the higher intensity of sunlight newly emerged flower burns and turns brown & black, wrinkle and after few days they wither.

To avoid this problem we carried out experiment using two chemicals named Green Miracle [Alcohol & Fatty acid] and SRP [Silicon 20%] which are reported to reduce sunburn, transpiration and maximize use of water.

Green miracle [http://www.tstanes.com/products-green-miracle.html] is new generation, reflective type of anti-transpirant cum anti-stress product. It is based on long chain fatty alcohol derived from non-edible vegetable oil.

Silicon [http://www.plantphysiol.org/content/plantphysiol/53/4/638.full.pdf] is emulsion forming type of anti-transpirant.

As mentioned above chemicals that is Green Miracle and Silicon were taken to carry out this experiment, and both chemicals doses are Green Miracle [3ml/L] & Silicon [2gm/L].

Spraying of these chemicals was carried out of 24/05/2020. Spraying was carried out by Tractor mounted blower with water of 100 liters and hence chemicals used for 100 liters of water are about 300ml of Green Miracle & 200gm of Silicon.

## OBSERVATIONS

After 5 days from spraying of both chemicals that is 29/04/2020, we found new flower buds begin to emerged, further more we check flower bud begin opening after 6 days of emergence of buds and after 7 days after flower bud opening, fruit setting begins, we recorded data of both treated & untreated orchards and for yielding better observation

we taken 7 rows of orchards and sprayed them with both chemicals and other 7 rows are remain untreated, from all 14 rows, we selected one orchard as a representative of that row. After recording data from these orchards we work out on their averages and recorded these observations -

**Table.1 Table showing observations on treated and untreated pomegranate orchard**

| Parameters | Treated | Untreated |
|---|---|---|
| Number of flower bud Emerged | 340 | 320 |
| Number of flower bud Opens | 280 | 180 |
| Number of Flower bud drop down | 100 | 120 |
| Number of flowers converted into Fruit | 180 | 60 |

## RESULTS AND DISCUSSION

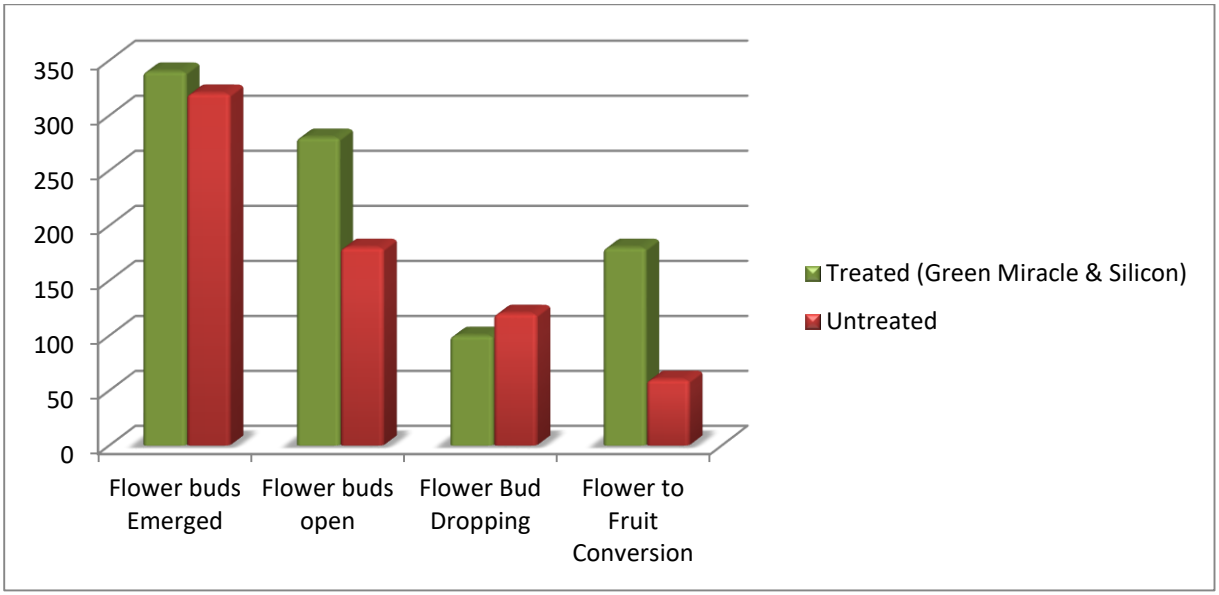


**Fig.1 Bar Graph showing results of Green miracle and Silicon on Pomegranate orchard**

From the analysis of the data we recorded that is from Table 1 & Fig 1, it is found that Green miracle and Silicon both chemicals used here are showing significant results on the orchard.

The results begin to show in the initial days of experiment from appearance of the number of buds we got on both treated and untreated orchards, It is clear in Table 1 that on treated orchards there are more number of Flower buds emerged than that of untreated orchards.

It is clearly mentioned in the Table 1 that percentage of flower buds opening is high in the treated orchards that is 82.35 % and whereas in untreated orchards the percentage of flower buds opening is 56.25 % , Difference in flower buds opening is really high and it's clear that treated orchards have more outcome than that of untreated orchard.
Flower bud dropping rate in both treated and untreated orchards is 29 % & 37 % respectively.
Overall, Treated orchard are showing greater outcome by showing more fruits bearing and that is about 34 % more than that of untreated orchard.

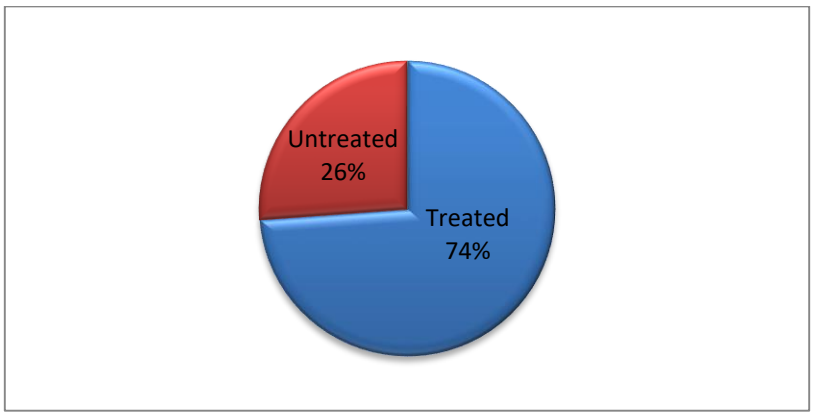


**Fig. 2 Pie chart showing the fruit bearing outcomes in treated and Untreated Orchard.**

## CONCLUSION

At the end of the experiment, it was found that applications of Green Miracle & Silicon were found to be best method to prevent sunburn in flowers of the pomegranate. Applications of Green Miracle & Silicon also increased Flower bud numbers and ultimately increase in the outcome of orchards by having more number of fruits bearing. Our experiment shows significant results on pomegranate orchards and it can be recommended to farmers, as it is showing significant results to the orchards and can improve the outcome of farmers.

## REFERENCES

[1] https://nrcpomegranate.icar.gov.in/files/Publication/44.pdf
[2] https://nrcpomegranate.icar.gov.in/files/Publication/42.pdf
[3] https://www.ijcmas.com/abstractview.php?ID=2773&vol=6-6-2017&SNo=131
[4] https://www.accuweather.com/en/in/solapur/204849/april-weather/204849
[5] http://www.tstanes.com/products-green-miracle.html
[6] http://www.plantphysiol.org/content/plantphysiol/53/4/638.full.pdf
[7] Management Strategies of Sun Burn in Fruit Crops-A Review Narayan Lal1* and Nisha Sahu2 1ICAR-NRC on Litchi, Muzaffarpur, Bihar, India 2ICAR-NBSSLUP, Division of RSA, Nagpur, MH, India
[8] The effect of maturity, sunburn and the application of sunscreens on the internal and external qualities of pomegranate fruit grown in Australia Palitha Weerakkody a, Jenny Jobling *,b,c, Marı´a Magdalena Vergara Infante b, Gordon Rogers c