

**EFFECT OF HYDROGEN CYNAMID, MINRAL OIL AND
GARLIC OIL ON BUD OPENING, VEGETATIVE GROWTH
AND FRUITING OF "BASATEEN MKM" PEAR CULTIVAR.**

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6. SUMMARY

The present investigation was conducted during two successive seasons in 2017 and 2018 on 5-year-old trees of the pear cultivar 'Basateen MKM,' budded on *Pyrus betulifolia* rootstock and grown in sandy soil in a private orchard at south Tahreer City, El Beheira Governorate, Egypt. The trees were healthy, free of defects, spaced at 4 × 5 m; open center trained and drip irrigated.

A total of seventy-eight trees were selected for the study and the same recommended regular horticultural practices were followed for all of them. The trees were subjected to different spraying treatments at the dormant bud stage at two different times (January 10 and 15) in each season. The spraying treatments were:

- T₁. Control (water only).
- T₂. 1 % hydrogen cyanamide (HC)
- T₃. 2 % hydrogen cyanamide (HC)
- T₄. 0.5 % garlic oil (GO) at
- T₅. 1 % garlic oil (GO) at
- T₆. 1% hydrogen cyanamide (HC) + 0.5 % garlic oil (GO)
- T₇. 1% hydrogen cyanamide (HC) + 1 % garlic oil (GO)
- T₈. 2% hydrogen cyanamide (HC) + 0.5 % garlic oil (GO)
- T₉. 2% hydrogen cyanamide (HC) + 1 % garlic oil (GO)
- T₁₀. 1% hydrogen cyanamide (HC) + 1 % mineral oil (MO)
- T₁₁. 1% hydrogen cyanamide (HC) + 2 % mineral oil (MO)
- T₁₂. 2% hydrogen cyanamide (HC) + 1 % mineral oil (MO)
- T₁₃. 2% hydrogen cyanamide (HC) + 2 % mineral oil (MO)

This experiment consisted of 26 treatments (13 treatment X 2 times) arranged in a factorial analysis in a randomized complete block design with three replicates for each treatment and one tree for each replicate.

Therefore, The objective of this study was to examine the effects of timing and concentration of various rest breaking agents (Dormex, garlic oil, and mineral oil), alone and in combination, on floral and vegetative bud opening time, vegetative growth parameters, leaf mineral content, fruit set, yield, and quality of Basateen MKM pear trees, under conditions of inadequate winter chilling in Egypt.

The result of this experiment could be summarized as follows:

1. Chilling hours was significantly higher and more effective in the second season than that of the first one.
2. All treatments led to the break of bud dormancy and compensated for the lack of chilling requirements compared with that of the control in both seasons. Furthermore, treatments of HC and GO hastened the time of budbreak by 10 days when compared to the untreated control in both seasons.

3. Spraying trees in the second season with different chemicals was more effective in improving budbreak than the first spraying.
4. Trees treated with 1% HC exhibited the highest values for the percentage of vegetative buds as compared to that of the untreated control and other treatments in both seasons. Individual application of 1% GO provided superior increase in the percentage of flowering buds as compared to that of the control and other treatments in both seasons.
5. All vegetative growth parameters were enhanced with 1% HC when compared to untreated control in both seasons.
6. The first spraying date (January 10) was more effective than the second for all vegetative growth parameters during both seasons.
7. Spraying trees with 1% HC induced the highest values for leaf N, P, and K content as compared to that of the control in both seasons.
8. All the treatments significantly increased the percentage of final fruit set and yield in both seasons compared to the untreated control trees.
9. GO alone or in combination with HC at different concentrations significantly reduced the average fruit length when compared to the untreated control.
10. GO alone or in combination with HC at different concentrations and HC with MO at different concentrations significantly decreased the average fruit diameter compared to the untreated control in both the seasons.
11. All the treatments significantly decreased the average fruit size, fruit weight, and fruit firmness compared to the untreated control in both the seasons.
12. The final fruit set percentage, as well as the total yield, were significantly higher in the second date of application than that in the first one. On the contrary, the average fruit weight, fruit size and fruit firmness were significantly higher in the first season than in the second one.
13. The average fruit acidity percentage was found to be significantly decreased than the untreated control.
14. The treatments of GO in all the treatments alone at 0.5% and 1%, HC 1% combined with GO at 0.5%, HC at 2% combined with GO at 0.5 and 1%, and HC at 1% combined with MO at 1% significantly increased the content of total soluble solids (TSS) compared to the untreated control.
15. All the treatments significantly increased the TSS/acid ratio compared with the control in the second season. Furthermore, the effect of the application dates on TSS content, acidity and TSS/acid ratio did not differ significantly in both the seasons.

Conclusion

Due to the U.S. Environmental Protection Agency (EPA) classifies dormex® at the highest toxicity category (category I), highly polluting, therefore, we recommend spraying the "Basateen MKM" pear trees with either 0.5% or 1% Go on (15th January), only under conditions similar to those of the present experiment.