Water Resources Research Institute

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Impact Assessment Report of Malaysian Made Liquid Fertilizers (Branded as Green Spot Fertilizer) on Selected Plantations at Satrameel Subwatershed Conditions of Islamabad

Liquid fertilizers named GSF 1 (Maroon) & GSF 2 (Green) provided by Ghadeer Inc (M) Sdn, Bhd Malaysia, were tested over selected fruit plant nurseries, mature orchard and vegetable seedlings at Satrameel Field Station of NARC, Islamabad.

The impact evaluation of both types of Liquid Fertilizer in context of selected growth parameters was made through experimental setup and report of analysis is attached herewith.

With best regards

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Executive Summary

Two types of Malaysian liquid fertilizers Manufactured by Ghadeer Inc (M) Sdn. Bhd., Malaysia branded as GSF-1 (In Maroon Color) and GSF-2 (In Green Color) were tested at Satrameel Field station of WRRI-NARC Islamabad on selected fruit plant nursery seedlings and established orchard plants from October 2011 to April 2012. It was told by the Manufacturers that GSF 1 having maroon color should be applied on plants during maturing/flowering/fruiting stage and GSF 2 having green appearance should be tested against young seedlings during growing stage and nursery plantations. The doses were calculated in consultation with fertilizer Manufacturer and 10 ml of Green Spot Fertilizer-2 (GSF-2) was diluted with 1000 ml of water and foliar applications were made over young fruit plants. Similarly, for mature orchard, the Green Spot Fertilizer-1 (GSF 1) was added in with same concentration. The experiment was conducted at Satrameel Field Station of WRRI-NARC, Islamabad. The impact of respective applications was quantified in terms of growth parameters (i.e. plant girth and height measurements) and comparison was made with plants, which were not provided with liquid fertilizers (i.e. Control). The experiment was made statistically homogeneous by selecting same number of plants for treated and control conditions. The growth parameters were observed every after two week time.

The GSF 2 applications were tested for wide range of young fruit plant seedlings available at nursery of Satrameel and those included Pomegranate, Leechi, Falsa, Mangoes and Citrus. While, GSF 1 was tested for mature lemons, Citrus and Italian olives. Except for Italian Olives, which remained fruitless for last more than 15 years, the dose of GSF 1 was same as 10 ml per 1000 ml of water. In case of olives, the concentrated dose of GSF 1 was applied every after 15 days (100 ml). In case of Olive, the indicators established for impact assessment was the fruiting (if any) on plants. Although during time of flowering for olives, there

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remained extreme drought conditions at Satrameel, which forced no irrigation or rainfall contributions, still, some flowerings was established and fewer fruits (though of very reduced size). But this particular olive application was made to ascertain the impact on fruit plants, which are fruitless for nearly two decades. The impact was though slight but still visible and prominent.

Overall, it was concluded through the experimental results and based upon physical reviews that both GSF 1 & 2 are effective on selected plants and contributed towards plant growth. Though no planned study was carried out for vegetable seedlings impact, but still some applications were made and significant response in growth of vegetable seedlings were observed both for seasonal and off-seasonal vegetables.

Based upon limited experimentation and associated outcomes, it is ascertained that the both products are effective and can be used under Islamabad conditions. Though more detailed studies are required to trace its effects for other plantations and especially field crops under different ecological conditions, but still preliminary results showed effectiveness in profound means. The results of experiments for all types of plantations at Satrameel during report period have been processed and **Annexed** as self-explanatory meanings.

A carefully review of data indicated that liquid fertilizer has produced best results for Lemon, Leechi, Citrus snfFalsa, followed by Pomegranate. The least impact on pomegranate may be due to the fact that during application times (Nov onward) it was dormant time for deciduous plantations like Pomegranate, while rest all plantations were under ever green class, so was impact more profound.

The Malaysian partners, who provided with the testing materials and remained very patient for outcome of this trial experiment, require the due acknowledgement. We hope in future we can explore more options and avenues of collaborations top better serve the poor farming community. Wishing all the best for your side.

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1. Results and Discussions

The impact of GSF 2 was tested on Pomegranate, Leechi, Lemon, Mango and Falsa through 10 ml/ L of water foliar applications every after 15 days. The growth parameters (plant girth and height) were monitored every after 15 days and results are summarized in Annexure attached. The results of applications are discussed in brief as below;

1.1. Impact on Leechi

The impact of leechi was very significant and during experimental trial period (Mid Nov 11 –April 12), the average girth was increased from 0.78 cm to 1.4 cm(80% increase), while height increased by 31 % on average basis for treated plants. The corresponding measurements for control were 54 % and 15 % respectively. Thus applications of GSF 2 has net increased the girth and height for leechi by an amount of 26 and 16 % respectively.

1.2. Impact on Lemon (Young)

Similarly, the young lemon plants was also studied by applying GSF 2 (green) liquid fertilizer and growth data measurements revealed that average girth and height of treated lemon increased by 9% and 15 % respectively. Corresponding Control measurements showed growth during report period by 0% and 7% respectively. Thus net growth attributed towards GSF applications over control conditions was 9 and 8 % for girth and height of lemon plants.

1.3. Impact on Falsa (Young)

The quantified impact of GSF 2 on Falsa seedlings over control was by an amount of 8 % and 1 % respectively. Referred to Annexure for details.

1.4. Impact on Mangoes (Young)

The experiment was also expanded to trace impact over mango young fruit plants. The data measurements indicated that during trial period, the treated

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plants grown from 2 cm to 2.7 cm (35 % girth gain) and 28.5 cm height to 40.83 cm thus indicating 43 % increase. Net growth over control plants was in tune of -6 % and 6% for girth and height respectively.

1.5 Impact on Citrus (Mature)

During same experiment, another Malaysian product named GSF 1 having maroon appearance was also tested on mature fruit plants available at Satrameel. The results of application for mature citrus plants indicated that average girth and height was increased by 6 % and 22 % respectively. While net growth over control plants was 0 % and 13%. Thus plants treated with liquid fertilizer increased more height than control plants, while girth remains unchanged.

1.6 Impact on Pomegranate (young)

During report period, the impact of GSF 2 (green) was also tested on pomegranate plants. Pomegranate belongs to deciduous fruit plant family and during most time of experiment, it was having dormant growth and therefore was not an ideal time for testing growth against any fertilizer application to see its impacts. However, still GSF 2 was applied on regular basis and in dosage as described above. The growth of treated plants increased by 11 and 9 percent respectively.

1.7. Impact on olive Trees (Mature)

During same experimental period it was mutually decided to trace the impact of GSF 1 on mature olive (Italian grafted). It was also decided that since there plants were not producing any fruit during last 10-15 years, therefore the best performance indicator would be fruiting on these plants. As a result two plants were selected and treated with concentrated dose of GSF 1 (100 ml per two weeks). Through during flowing time, there was acute shortage of irrigation/rainfall waters at Satrameel, due to which excessive flowing was not

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visible. However, due to GSF 1 applications, at least some flowers only on treated plants were witnessed and fewer fruits on olives were also visible. This indicated that GSF 1 can be helpful in plants which have not produced fruits for longer times. However, further testing is required for other types of fruit plants. In case of Satrameel, it did provided some success on olive plants.

1.8. Impact on Vegetable Seedlings

Though no planned data was taken to trace impacts of GSF 2 over young seedlings, however, it was tested and physical observation indicated that applications of green liquid was very effective on vegetable seedlings both for seasonal and even under tunnels for off-seasonal plants. This indicated that these might be helpful nutrient for quick vege. growths. More detailed studies, however, can be undertaken to explore the level of effectiveness on various vegetables.

2. Conclusions

Limited testing of GSF 1 and GSF 2 at Satrameel on various fruit plants indicated that these are effective nutrients for plant growths. The effect was more profound over evergreen type fruit plants than deciduous. Moreover, an impact on vegetable seedlings was also quite encouraging. Random soil analysis was conducted at Satrameel and it was noted that the fertility/NPK level of the soil was exceptionally high as compare to the last 20 years data. Based upon Satrameel experimental work, this may be effective for young nursery fruit plants and vegetable seedlings. Further and specific testing may be required for adaptation for various plants and agro ecological conditions.

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