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# Economic Analysis of Medicinal Herbs in Glori Lily (*Gloriosa Superba L.*) Under Integrated Nutrient Management Practices

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**ABSTRACT**

*Field investigation was carried out at the farmer's field, Devanur village, Ariyalur District, Tamilnadu during July 2007 - December 2008 to find out the effect of integrated nutrient management practices on the economics of glory lily (Gloriosa superba L). The experiment was laid out in split-plot design with three replications. The treatments consisted of different organic manures in main plots (M1-Control, M2-Farm Yard Manure (FYM) @ 12.5 t ha-1, M3- Enriched Farm Yard Manure (EFYM) @ 750 kg ha-1 and M4-Pressmud compost @ 5 t ha-1) and different levels of inorganic nitrogen in sub-plots (S0-Control, S1-100% N, S2-75% N, S3-50% N, and S4-25% N ). The results of the experiment revealed that application of EFYM@750 kg ha-1 (M3) recorded the highest gross income, net income and return per rupee invested. Among the different levels of inorganic nitrogen, application of 100 % N (S1) recorded the highest value of economics. With regard to interaction effect, application of EFYM @ 750 Kg ha-1 + 75 per cent recommended N (90 kg ha-1) (M3S2) gave the highest gross income of Rs.1663686 ha-1, net income of Rs.1288024 ha-1 and return per rupee invested of Rs. 4.62.*

**KEYWORDS : Gloriosa superba, INM, Economic analysis, BCR ratio.**

## INTRODUCTION

Glori lily (*Gloriosa superba* L.) is an important medicinal crop. India is endowed with a rich wealth of medicinal plants. The is an annual demand of Gloriosa was 65.4 t during 2001 A.D and it would be 100.5 t in 2005 A.D. with an annual growth rate of 15.4 per cent. In India, it is cultivated in an area of 2000 ha and in Tamilnadu around 1000 ha with an annual production of 650mt of seeds and tubers. Glori lily is a highly profitable medicinal crop. The productivity of glori lily depends on the source and amount of nutrient supply under which it is cultivated. Although soil supplies some amount of nutrients (native), it is imperative to meet the requirements by way of balanced external nutrient supply *viz*., organic and inorganic sources. Among different nutrient supply technologies, use of organics for increasing the production is emphasized because continuous use of chemical fertilizers have led to several hazards in soil by heavy withdrawal of nutrients (Prasad and Singh, 1981) and nutrient imbalance (Singh *et al.,* 1989) and ultimately resulting in the reduction of crop yields.

## MATERIALS AND METHODS

Field experiment was conducted during July-2007 to Dec-2008 under rainfed condition at the farmer's. The experimental field was red loamy soil with pH 6.5, available nitrogen (231 kg ha$^{-1}$), available phosphorus (16 kg ha$^{-1}$) and available potassium (293 kg ha$^{-1}$). The experiment was laid out in split-plot design with three replications. The treatments consist of four main plot treatments *viz*., $M_1$ – Control, $M_2$ – FYM @ 12.5 t ha$^{-1}$ , $M_3$ – EFYM @ 750 kg ha$^{-1}$ and $M_4$ - Pressmud compost @ 5 t ha$^{-1}$and Sub-plot treatments consisted five levels of inorganic N *viz.,* $S_0$-control $S_1$-100 per cent recommended nitrogen (120 kg ha$^{-1}$), $S_2$-75 per cent recommended nitrogen (90 kg ha$^{-1}$) $S_3$-50 percent recommended nitrogen (60 kg ha$^{-1}$) and $S_4$-25 per cent recommended nitrogen (30 kg ha$^{-1}$)The nitrogen (N) was supplied through urea. A common dose of 50 kg $P_2O_5$ and 75 kg $K_2O$ ha$^{-1}$ was followed. Observations on seed yield and tuber yield were recorded based on the prevailing market prices and the economics of production cost were worked out.

## RESULTS AND Discussion

Different organic manures and nitrogen levels exerted significant influence on seed and tuber yield. Among the different sources of organic manures tested, application of EFYM @ 750 kg ha$^{-1}$ ($M_3$) registered the highest seed and tuber yield of 512.65 and 1828.40 kg ha$^{-1}$, respectively. Application of inorganic nitrogen at 100 per cent (120 kg ha$^{-1}$) recorded significantly higher seed yield of 672 kg ha$^{-1}$and tuber yield of 2075.29 kg ha$^{-1}$. Application of EFYM @ 750 kg ha$^{-1}$ combined with 75 per cent recommended nitrogen @ 90kg ha$^{-1}$ ($M_3S_2$) found to be superior among the treatments. This treatment registered the highest seed yield of 791.28 kg ha$^{-1}$ and tuber yield of 2380.50 kg ha$^{-1}$. EFYM not only supplies a variety of macro and micro nutrients to the soil, but also improves the physico-chemical and biological properties of the soil which helps to maintain the soil productivity and soil health (Cooke, 1982).

Application of EFYM @ 750 kg ha$^{-1}$ + 75 per cent recommended N (90 kg ha$^{-1}$) ($M_3$ $S_2$) registered the highest net return of Rs. 1288024 ha$^{-1}$ and higher return rupee$^{-1}$ invested of Rs. 4.62, respectively. Application of EFYM @ 750 kg ha$^{-1}$ + 100 per cent recommended N ($M_3S_1$) was found to be next in terms of net return and return rupee$^{-1}$ invested. Increased and continuous availability of nutrients with integrated use of EFYM @ + 75 per cent N increased the seed yield and tuber yield might be the reason for higher gross income, net income and return rupee$^{-1}$ invested. Similar findings of higher net income and BCR due to integrated use of EFYM + nitrogen in maize was reported by Tolessa and Friesen (2001).

## Conclusion

Based on the above results, it can be concluded that the integrated use of EFYM @ 750 kg ha$^{-1}$ and 75 per cent recommended N (90 kg ha$^{-1}$) is found to be an appropriate agro-technique for augmenting the productivity and profitability of glori lily. EFYM not only supplies a variety of macro and micro nutrients to the soil, but also improves the physico-chemical and biological properties of the soils which help to enhancing the soil microbes, maintain the soil productivity and soil health.

**Table1. Effect of INM on seed yield, tuber yield (kg ha$^{-1}$) and economics analysis of glori lily**

| Treatments | Seed yield (kg ha$^{-1}$) | Tuber yield (kg ha$^{-1}$) | Total cost of cultivation (Lakh Rs. ha$^{-1}$) | Gross return (Lakh Rs. ha$^{-1}$) | Net return (Lakh Rs. ha$^{-1)}$ | Return per rupee invested (BCR) |
|---|---|---|---|---|---|---|
| $M_1$ $S_0$ | 373.00 | 1670.75 | 288145.62 | 948825 | 660679.38 | 3.20 |
| $M_1$ $S_1$ | 672.00 | 2075.29 | 311693.95 | 1428987 | 112829.05 | 4.58 |

| Treatments | Seed yield (kg ha$^{-1}$) | Tuber yield (kg ha$^{-1}$) | Total cost of cultivation (Lakh Rs. ha$^{-1}$) | Gross return (Lakh Rs. ha$^{-1}$) | Net return (Lakh Rs. ha$^{-1}$) | Return per rupee invested (BCR) |
|---|---|---|---|---|---|---|
| **$M_1$ $S_2$** | 634.50 | 2034.34 | 301143.67 | 1371702 | 1071558.33 | 4.55 |
| **$M_1$ $S_3$** | 552.76 | 1875.72 | 309765.22 | 1226028 | 936262.78 | 3.95 |
| **$M_1$ $S_4$** | 413.85 | 1708.20 | 295275.04 | 1009080 | 723804.96 | 3.41 |
| **$M_2$ $S_0$** | 423.57 | 1723.60 | 288915.72 | 1025364 | 736448.28 | 3.54 |
| **$M_2$ $S_1$** | 731.41 | 2256.81 | 396109.67 | 1554735 | 1158625.33 | 3.92 |
| **$M_2$ $S_2$** | 684.76 | 2087.76 | 387563.62 | 1448040 | 1060476.33 | 3.73 |
| **$M_2$ $S_3$** | 561.73 | 1892.67 | 370179.90 | 1241877 | 871697.10 | 3.35 |
| **$M_2$ $S_4$** | 466.56 | 1786.03 | 340090.77 | 1095681 | 75590.23 | 3.22 |
| **$M_3$ $S_0$** | 512.65 | 1828.40 | 293467.98 | 1163700 | 87023.02 | 3.96 |
| **$M_3$ $S_1$** | 781.72 | 2353.88 | 374615.88 | 1644228 | 1269612.12 | 4.38 |
| **$M_3$ $S_2$** | 791.28 | 2380.50 | 360061.93 | 1663686 | 1288024.07 | 4.62 |
| **$M_3$ $S_3$** | 728.38 | 2165.15 | 355732.16 | 1523601 | 1149868.84 | 4.28 |
| **$M_3$ $S_4$** | 617.70 | 2011.31 | 350043.03 | 1344633 | 974589.97 | 3.84 |
| **$M_4$ $S_0$** | 460.46 | 1765.68 | 289253.95 | 1082256 | 793002.05 | 3.74 |
| **$M_4$ $S_1$** | 745.56 | 2294.76 | 385447.90 | 1583100 | 1197652.10 | 4.10 |
| **$M_4$ $S_2$** | 689.58 | 2093.24 | 374901.85 | 1455468 | 1080566.15 | 3.88 |
| **$M_4$ $S_3$** | 578.56 | 1905.15 | 364518.13 | 1265817 | 901298.87 | 3.17 |
| **$M_4$ $S_4$** | 472.13 | 1785.74 | 340029.06 | 1102278 | 762248.94 | 3.24 |
| **$S.E_D$** | M - 0.4<br>S - 0.98 | M - 2.07<br>S - 1.74 | | | | |
| **CD(P=0.05)** | M - 1.81<br>S - 2.01 | M - 5.08<br>S - 3.54 | | | | |

(Cost of Tuber @ Rs. **300** kg$^{-1}$, Seed @ Rs. **1200** kg$^{-1}$)

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