

application of 30 Kg N and 20 Kg P<sub>2</sub>O<sub>5</sub>/ha as enriched Fym with azospirillum inoculation was 1.79 as against 1.15 for the same level of nutrients applied as straight fertilizers with Fym and 1.03 for the application of Fym alone. (Table 3)

The results have clearly indicated that there is a definite yield increase through fertilizer use in rainfed lax panicle sorghum grown in red soils. This yield advantage can be further enlarged by adoption of an integrated nutrient management technology wherein the fertilizer is applied in the form of enriched Fym along with azospirillum inoculation.

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## NURSERY MANURING ON GROWTH AND NPK UPTAKE OF RICE SEEDLINGS

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#### ABSTRACT

Field experiments conducted at Rice Research Station, Ambasamudram during Kar and Pishanam seasons of 1984-85 with TKM 9 and IR 20 rice varieties respectively revealed that application of DAP at 2 Kg per cent to the nursery resulted in increased seedling height, number of leaves per seedling, shoot dry weight, root length and uptake of NPK.

Rice is the major staple cereal crop in India. Lower average yield in India and Tamil Nadu can be attributed to poor soil fertility, improper water and nutrient management, pest and disease problems and unfavourable weather condition. Intensive research has also been diverted to solve the problems related to soil fertility, drainage, nutrient and pest management through coordinated networks of research all over the country. So far research attention was given to rice in the main filed management and the nursery management did not receive adequate attention. Proper management in nursery will

reflect on the behaviour of the crop in the main field. Management of rice in nursery is comparatively less expensive than in the main field. A field experiment was conducted at Rice Research Station, Ambasamudram during Kar (June - September) and Pishanam (Oct. - March) seasons of 1984-85 with the objective to study the effect of nursery manuring on the influence of growth of rice and its uptake of NPK and their interaction.

#### MATERIALS AND METHODS

Rice variety TKM 9 was the test crop during Kar season, while IR 20 was the test

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crop during Pishanam season. The experimental soil was sandy loam in texture with a PH of 5.5. The soil was medium in available N (343 Kg/ha), high in available  $P_2O_5$  (26.0 Kg/ha) and low in available Potassium (79 Kg/ha) and was free from salt hazards. The following were the nursery manuring treatments studied in four replications.

1. Diammonium Phosphate (DAP) at 2 Kg per cent as soil application,
2. Application of N at 360 g per cent as urea
3. Application of  $P_2O_5$  at 920 g per cent as single Superphosphate
4. Sprouted seed treatment with 3 per cent DAP solution and
5. Farmers method - no manuring.

There were altogether 20 plots of each 3 x 4m<sup>2</sup>. Routine cultural practices were followed in raising the nursery. For treatments 1 to 3, calculated quantities of fertilizers as per treatment schedule were added before the last levelling of plots. For the fourth treatment, the sprouted seeds after incubation were soaked in the supernatant solution of 3 per cent DAP for 20 minutes and sown after shade drying for 10 minutes. For Kar season, the seeds were sown on 10.6.84 and pulled out on 5.7.84 (25th day) for observation and for Pishanam season sowing was taken up on 6.11.84 and the seedlings were pulled out on 5.12.84 (30th day). At the time of pulling out, seedlings were uprooted with the entire root system intact and washed clean with water. From twenty seedlings selected at random from each plot, height, number of leaves per seedling and root length were recorded. One hundred number of seedlings were selected at random, oven dried and dry weight of shoot and root were recorded separately. Seedlings sampled for dry weight were used for the estimation of

total NPK contents as per the conventional procedures and from the contents of NPK, the uptake values were computed.

## RESULTS AND DISCUSSION

Seedling height was the highest in the treatment supplied with DAP at 2 kg per cent during the Kar season (Table 1). During Pishanam season, though application of urea to supply N at 360 g per cent resulted in maximum plant height, this treatment was comparable with that of DAP 2 kg per cent application. Similar trend of enhanced seedling height, this treatment was comparable with that of DAP 2 kg per cent application. Similar trend of enhanced seedling height as a result of DAP application to nursery at 2 kg per cent was reported by Venkataraman (1977) and Sivarama Shetty *et al.*, (1980). Number of leaves per seedling was also maximum in treatment supplied with DAP during Kar season and urea during the Pishanam season. Variation between the two seasons could be due to varietal and seasonal effects.

Shoot dry weight of seedling was higher in treatments supplied with DAP at 2 kg per cent in both the seasons. Similar trend of results due to the application of either DAP at 2 kg per cent or combined application of urea and superphosphate on equivalent nutrient basis were reported by Pandiamani (1982) and Rajendran (1984).

Root length of seedlings was maximum with DAP application in both the seasons. In the case of root dry weight though the application of urea to supply 360 g of N per cent resulted in maximum dry weight, this treatment was comparable with that of DAP 2 kg per cent application. Similar findings on increase in root length, and root dry weight as a result of DAP application to nursery were reported by Palaniappan (1982) and Rajendran (1984).

- 1. Seedling characters as influenced by nursery manuring

|                                       | Kar season (TKM 9) |               |                                  |                  |                                 | Pishanam season (IR 20) |               |                                  |                  |                                 |
|---------------------------------------|--------------------|---------------|----------------------------------|------------------|---------------------------------|-------------------------|---------------|----------------------------------|------------------|---------------------------------|
|                                       | Height (cm)        | No. of leaves | Shoot dry weight g/100 seedlings | Root length (cm) | Root dry weight g/100 seedlings | Height (cm)             | No. of leaves | Shoot dry weight g/100 seedlings | Root length (cm) | Root dry weight g/100 seedlings |
| P at 2 kg per cent                    | 36.8               | 5.8           | 23.2                             | 12.7             | 3.9                             | 36.1                    | 4.2           | 18.6                             | 9.5              | 3.2                             |
| at 360 g per cent as a                | 27.7               | 3.9           | 17.8                             | 10.4             | 4.4                             | 37.3                    | 4.7           | 14.3                             | 9.4              | 3.5                             |
| Ds at 920 g per cent as per phosphere | 21.9               | 4.1           | 8.2                              | 10.5             | 2.7                             | 24.2                    | 4.2           | 6.5                              | 6.4              | 2.2                             |
| Proouted seed treatment with 3% DAP   | 24.6               | 5.1           | 11.2                             | 11.6             | 2.6                             | 24.8                    | 4.1           | 8.9                              | 7.1              | 2.1                             |
| farmers method (no manuring)          | 21.2               | 3.2           | 7.0                              | 10.1             | 2.9                             | 25.4                    | 4.3           | 5.6                              | 6.3              | 2.3                             |
| CD                                    | 2.1                | 0.6           | 2.4                              | 1.3              | 1.3                             | 2.5                     | 0.2           | 1.9                              | 1.0              | 1.0                             |

Table 2. NPK uptake by seedlings (mg/100 seedlings) as influenced by nursery manuring

| Treatment                                                        | Kar season (TKM - 9) |     |     | Pishanam season (IR - 20) |     |     |
|------------------------------------------------------------------|----------------------|-----|-----|---------------------------|-----|-----|
|                                                                  | N                    | P   | K   | N                         | P   | K   |
| DAP at 2kg per cent                                              | 325                  | 177 | 507 | 293                       | 165 | 485 |
| N at 360 g per cent as urea                                      | 240                  | 123 | 378 | 216                       | 123 | 367 |
| P <sub>2</sub> O <sub>5</sub> at 920g per cent as superphosphate | 101                  | 56  | 191 | 91                        | 56  | 190 |
| Sprouted seed treatment with 3% DAP                              | 157                  | 82  | 252 | 141                       | 81  | 240 |
| Farmers method (No manure)                                       | 94                   | 43  | 160 | 84                        | 53  | 170 |
| CD                                                               | 47                   | 10  | 48  | 42                        | 10  | 46  |

NPK uptake by seedlings (Table 2) higher with DAP application in both the season (NPK @ 325:177:507 for Kar and 293:165:485 Kg/ha for Pishanam) and the lowest under farmers practice, (NPK 94:43:160 Kg/ha during Kar and 84:54:170 Kg/ha during Pishanam season). Since DAP contains N and P, its application to nursery has favourably influenced the growth of the seedlings; hence the uptake of NPK was more under this treatment. Since the treatment under "farmers method" received no nutrient addition, the uptake of NPK was lowest for this treatment. Dhanapalan Mosi and Mohammed Malik (1980) also observed enhanced nutrient uptake by rice seedlings under DAP application.

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