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Dry matter accumulation and nutrient uptake of transplanted rice and zero till maize as influenced by nutrient levels and weed management practices

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Abstract
"A field experiment was conducted during "*kharif"* and "*rabi"* seasons of 2022-23 and 2023-24 at S.V. Agricultural College Farm, Tirupati in "split-plot design" with three replications to know the effect of different nutrient levels and weed management practices on transplanted rice and zero till maize. Among the different nutrient levels, significantly higher dry matter production, nutrient uptake and grain and straw yield were obtained with the application of 150% RDF in transplanted rice *fb* 125% RDF in zero till maize. Among the weed management practices tested, higher dry matter production, nutrient uptake and grain and straw yield were recorded with HW twice at 20 and 40 DAT, which was at par with PE application of triafamone + ethoxysulfuron 67.5 g ha^{-1} *fb* halosulfuron-methyl 67.7 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT in transplanted rice. In zero till maize, HW twice at 20 and 40 DAS recorded the higher dry matter production, nutrient uptake and kernel and stover yield which was statistically comparable with PoE application of mesotrione + atrazine 875 g ha^{-1} at 20 DAS *fb* HW at 40 DAS on sandy clay loam soils of "Southern Agro-Climatic Zone of Andhra Pradesh". The lowest higher dry matter production, nutrient uptake and yields were obtained with the application of 100% RDF in transplanted rice *fb* 75% RDF in zero till maize. Unweeded check (W_6) resulted in lower dry matter production, nutrient uptake and grain and straw yield in both the crops".

Keywords: Nutrient levels, weed management practice, dry matter production, nutrient uptake and yield

Introduction
Rice (*Oryza sativa* L.) is a key cereal crop that feeds one-third of the world's population and grows in a variety of climatic and agro-ecological zones. In India, rice is cultivated in an area of 46.5 million hectares with a production of 135.54 million tones and productivity of 2.85 t ha^{-1} (Ministry of Agriculture and Farmer's Welfare, Government of India, 2023-24). Transplanting in puddle soil is the most popular and traditional method for cultivating rice in irrigated lowland environments. Nutrient management must be sound and balanced in order to meet production targets in a sustainable manner. Chemical fertilizer is the fastest way to reverse the rate of nutrient extraction from the soil. Weeds are one of the biggest challenges to good crop production. Depending on the intensity of weed infestation, yield losses in transplanted rice may vary from 29 to 63%. The diverse weed flora under transplanted conditions significantly reduced the grain yield (Jaswal and Singh, 2019) [9]. Continuous rains during the cropping season, along with scarcity and high labor wages during peak weeding operations, particularly in the crop's early stages, make weeding extremely difficult and unprofitable. Farmers want an alternative low-cost weed management technique to achieve broad-spectrum weed control and higher rice output. In light of these circumstances, herbicides have emerged as a significant and dependable tool for weed control.
Maize is the world's third most significant cereal crop, following wheat and rice. Maize is cultivated on 9.68 million hectares in India, with a total yield of 31.51 million tons and a productivity of 3195 kg ha^{-1}. The rice-maize cropping system covers 3.5 million hectares in Asia, whereas it is planted on 0.53 million hectares in India. Zero-tillage improves soil qualities

and lowers production costs, but also results in higher yield loss due to significant weed infestation and uneven nutrition. "Rice and maize are both very nutrient-demanding crops". Maize is becoming increasingly important in conservation agriculture since it is a widely spaced crop with a modest growth rate in its early stages. Crop establishment and weed management strategies are crucial in zero tillage maize cultivation but difficult to manage using traditional methods such as hand weeding. Chemical weed control is an efficient and cost-effective control method for modern crop production (Yadav *et al.*, 2022) [19]. When herbicides with distinct modes of action are blended, they bind to different target sites in the target weed, reducing the possibility of target site resistance in vulnerable species. "Technological advancements in herbicide mixing with various active components, such as ready mix or tank mix herbicides, are beneficial for achieving broad-spectrum weed control".

Materials and Methods

A field experiment was conducted during *kharif* and *rabi* seasons of 2022-23 and 2023-24 at S.V. Agricultural College Farm, Tirupati**.** The soil of the experimental site was a sandy clay loam texture, neutral in reaction, low in electrical conductivity, low in organic carbon, low in available nitrogen (250.2 kg ha^{-1}), medium in available phosphorus (26.2 kg ha^{-1}) and available potassium (305.4 kg ha^{-1}). Rice variety "NLR-34449" was taken as the test variety. The experiment was laid out in "split-plot design" with the treatments in main plot comprised of three nutrient levels *viz.*, 100% RDF (N_1), 125% RDF (N_2) and 150% RDF (N_3) under main plots and six weed management practices assigned to sub plots *viz.*, Pre-emergence (PE) application of pretilachlor 750 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + pyrazosulfuron-ethyl 25 g ha^{-1} (tank-mix) at 20 DAT (W_1), PE application of penoxulum + butachlor 820 g ha^{-1} (ready mix) *fb* bispyribac-sodium 25 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} (tank-mix) at 20 DAT (W_2), PE application of triafamone + ethoxysulfuron 67.5 g ha^{-1} (ready mix) *fb* halosulfuron-methyl 67.7 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} (tank-mix) at 20 DAT (W_3), PE application of bensulfuron methyl + pretilachlor 660 g ha^{-1} (ready mix) *fb* hand weeding at 40 DAT (W_4), hand weeding (HW) twice at 20 and 40 DAT (W_5) and unweeded check (W_6). The RDF for rice crop in Southern Agro-Climatic Zone of Andhra Pradesh was 120:60:40 kg N: P_2O_5: K_2O ha^{-1}. Twenty seven days old seedlings were transplanted with a spacing of 20 cm x 10 cm @ two seedlings $hill^{-1}$. Application of nutrients was done as per the treatments in the form of urea, single super phosphate and muriate of potash, respectively. Nitrogen was applied in three splits at initial, tillering and at panicle initiation stages. Entire quantity of phosphorus was applied at the time of transplanting and potassium was applied in two splits, ½ at the time of transplanting and the remaining ½ at panicle initiation stage. Pre-and post-emergence herbicides were sprayed as per the treatments.

Immediately after harvest of the rice, bold and healthy seeds of maize (DHM-1117) @ 20 kg ha^{-1} were dibbled at a spacing of 60 cm x 20 cm under no-till condition manually to obtain required plant population. The treatments in main plot comprised of three nutrient levels *viz.*, 125% RDF (N_1), 100% RDF (N_2) and 75% RDF (N_3) under main plots and six weed management practices assigned to sub plots *viz.*, Post-emergence (PoE) application of topramezone 25.2 g ha^{-1}at 20 DAS *fb* hand weeding at 40 DAS (W_1), PoE application of halosulfuron-methyl 67.7 g ha^{-1} + ethoxysulfuron 20 g ha^{-1} (tank-mix) at 20 DAS *fb* hand weeding at 40 DAS (W_2), PoE application of halosulfuron-methyl 67.7 g ha^{-1} + tembotrione 100 g ha^{-1} (tank mix) at 20 DAS *fb* hand weeding at 40 DAS (W_3), PoE application of mesotrione + atrazine 875 g ha^{-1} (ready mix) at 20 DAS *fb* hand weeding at 40 DAS (W_4), Hand weeding twice at 20 and 40 DAS (W_5) and Unweeded check (W_6). The RDF for rice crop in Southern Agro-Climatic Zone of Andhra Pradesh was 240:80:80 kg N: P_2O_5: K_2O ha^{-1}. Application of nutrients was done as per the treatments in the form of urea, single super phosphate and muriate of potash, respectively. One fourth dose of nitrogen along with entire dose of phosphorus was applied at the time of sowing while potassium was applied in two splits, ½ at the time of sowing and the remaining ½ at tasselling and silking stage. The remaining quantity of nitrogen was applied at 25-30 DAS, 45-50 DAS and 60-65 DAS. Post-emergence herbicides were sprayed as per the treatments. Five plants were selected at random from net plot area and labeled with tags for recording parameters during crop growing period. The data recorded on various parameters of crop during the course of study was statistically analyzed by following the analysis of variance procedure as suggested by Panse and Sukhatme (1985) [15]. Statistical significance was tested with F test at 5 per cent level of probability and compared the treatment means with critical difference. Based on the nutrient content in grain and straw of rice crop, the uptake of N, P and K was worked out and expressed in kg ha^{-1} using the following formula

$$\text{Nutrient uptake (kg ha}^{-1}) = \frac{\text{Nutrient content (\%) x Dry matter production (kg ha}^{-1})}{100}$$

Results and Discussion

Dry matter production of transplanted rice

Dry matter production of transplanted rice at harvest was significantly influenced by different nutrient levels and weed management practices (Table 1.). Among the nutrient levels, higher dry matter production was recorded with 150% RDF (N_3), which was significantly superior to 125% RDF (N_2). This might be due to enhanced metabolic activity, the taller plants with more number of tillers and larger leaf area that resulted in efficient photosynthesis because of increased availability of vital nutrients, which inturn led to increased dry matter production. These results are in close conformity with Kumar *et al.* (2017d) [10]. Significantly lower dry matter production was recorded with 100% RDF (N_1).

With regards to weed management practices, higher dry matter production was observed with HW twice at 20 and 40 DAT (W_5), which was statistically comparable with PE application of triafamone + ethoxysulfuron 67.5 g ha^{-1} *fb* halosulfuron-methyl 67.7 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT (W_3). This might be owed to better control of all categories of weeds resulting in increased availability of nutrients that led to improved crop growth, plant stature and number of tillers, which inturn resulted in increased dry matter production. The results were in agreement with the findings of Mohapatra *et al.* (2021b) [13]. The next best weed management practice was PE application of bensulfuron methyl + pretilachlor 660 g ha^{-1} *fb* HW at 40 DAT (W_4), which was comparable with PE application of penoxulum + butachlor 820 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT (W_2), but significantly superior than PE application of pretilachlor 750 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + pyrazosulfuron-ethyl 25 g ha^{-1} at 20 DAT (W_1). The lowest dry matter production was observed with unweeded check (W_6), which was significantly lower than rest of the weed management practices. This might be due to

reduced number and size of the leaves including tillers per unit area and finally decreased the dry matter production as a result of severe competition offered by weeds.

Nutrient uptake by transplanted rice

Nutrient uptake *viz.*, nitrogen, phosphorus and potassium by transplanted rice were varied significantly due to nutrient levels and weed management practices (Table 1). With respect to different nutrient levels, nitrogen, phosphorus and potassium uptake by transplanted rice was found to be higher with 150% RDF (N_3), which was significantly superior to 125% RDF (N_2). This is attributed to higher application of nutrients that enhanced the mineralization process, which inturn increased the availability of nutrients that led to an increased nutrient uptake by the crop. The results are in accordance with Adilakshmi *et al.* (2022) [1] and Awio *et al.* (2023) [2]. While the uptake of nutrients was lower with 100% RDF (N_1).

Among the weed management practices, higher uptake of nitrogen, phosphorus and potassium by transplanted rice was observed with HW twice at 20 and 40 DAT (W_5), which was statistically at par with PE application of triafamone + ethoxysulfuron 67.5 g ha^{-1} *fb* halosulfuron-methyl 67.7 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT (W_3). Higher nutrient uptake under these treatments was due to better control of weeds leading to lower depletion of nutrients by weeds and higher nutrient uptake by rice crop. Similar results were reported by Barla *et al.* (2021) [4]. The next best weed management practice in recording higher uptake of nutrients was PE application of bensulfuron methyl + pretilachlor 660 g ha^{-1} *fb* HW at 40 DAT (W_4), whih was comparable with PE application of penoxulum + butachlor 820 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT (W_2) and significantly higher with PE application of pretilachlor 750 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + pyrazosulfuron-ethyl 25 g ha^{-1} at 20 DAT (W_1). The lowest uptake of nutrients by transplanted rice was recorded with unweeded check (W_6), which was significantly lower than rest of the weed management practices. This might be due to severe weed infestation during entire crop growth period lead to decreased stature of growth and dry matter production by crop and finally reduced uptake of nutrients by crop.

Grain and straw yield of transplanted rice

Data pertaining to grain and straw yield of transplanted rice was significantly influenced by nutrient levels and weed management practices (Fig. 1). Among the nutrient levels, the highest grain and straw yield was observed with 150% RDF (N_3), which was significantly superior to 125% RDF (N_2). This might be due to adequate supply of nutrients that allowed the rice crop to synthesize more chlorophyll content and better production and translocation of photosynthates resulted in higher yield attributing characters and ultimately higher grain and straw yield of rice. The results were in conformity with the findings of Adilakshmi *et al.* (2022) [1]. The lowest grain and straw yield was recorded with 100% RDF (N_1), which was significantly lower than rest of the nutrient level.

With respect to different weed management practices, hand weeding twice at 20 and 40 DAT (W_5) was statistically at par with PE application of triafamone + ethoxysulfuron 67.5 g ha^{-1} *fb* halosulfuron-methyl 67.7 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT (W_3) in obtaining higher grain and straw yield and both of them were significantly higher than rest of the weed management practices. This might be due to lower crop weed competition for growth resources throughout the crop growth period that enabled the crop for greater utilization of growth resources, which enhanced the vegetative and reproductive potential of the crop resulting in higher yields. The results are similar with those of Jaiswal and Gupta (2020) [8] and Mohapatra *et al.* (2021b) [13]. The next best weed management practice was PE application of bensulfuron methyl + pretilachlor 660 g ha^{-1} *fb* HW at 40 DAT (W_4), which was significantly superior to PE application of penoxulum + butachlor 820 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT (W_2) and PE application of pretilachlor 750 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + pyrazosulfuron-ethyl 25 g ha^{-1} at 20 DAT (W_1) with significant disparity between the later two. The lowest grain and straw yield was observed with unweeded check (W_6), which was significantly lower than rest of the weed management practices. This might be due to severe weed competition and poor assimilation of photosynthates.

Table 1: Dry matter production and nutrient uptake (kg ha^{-1}) of transplanted rice at harvest as influenced by nutrient levels and weed management practices (pooled data of two years)

Treatments	Dry matter production (kg ha^{-1})	Nutrient uptake (kg ha^{-1})		
		Nitrogen	Phosphorous	Potassium
Nutrient levels (N)				
N_1: 100% RDF	11143	66.6	14.64	82.5
N_2: 125% RDF	12300	76.3	16.58	92.2
N_3: 150% RDF	12923	84.0	18.12	99.9
S.Em±	155.9	1.53	0.267	1.66
CD (P=0.05)	612	6.0	1.05	6.5
Weed management practices (W)				
W_1: PE application of pretilachlor 750 g ha^{-1} *fb* bispyribac-sodium 25 g ha^{-1} + pyrazosulfuron-ethyl 25 g ha^{-1} (tank-mix) at 20 DAT	11135	66.7	14.66	82.7
W_2: PE application of penoxulum + butachlor 820 g ha^{-1} (ready mix) *fb* bispyribac-sodium 25 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} (tank-mix) at 20 DAT	12206	76.2	16.56	92.2
W_3: PE application of triafamone + ethoxysulfuron 67.5 g ha^{-1} (ready mix) *fb* halosulfuron-methyl 67.7 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} (tank-mix) at 20 DAT	13425	85.6	18.44	101.6
W_4: PE application of bensulfuron methyl + pretilachlor 660 g ha^{-1} (ready mix) *fb* hand weeding at 40 DAT	12723	79.6	17.24	95.6
W_5: Hand weeding twice at 20 and 40 DAT	13851	88.9	19.09	104.8
W_6: Unweeded check	9391	56.8	12.67	72.7
S.Em±	213.3	1.59	0.291	1.42
CD (P=0.05)	616	4.6	0.84	4.1

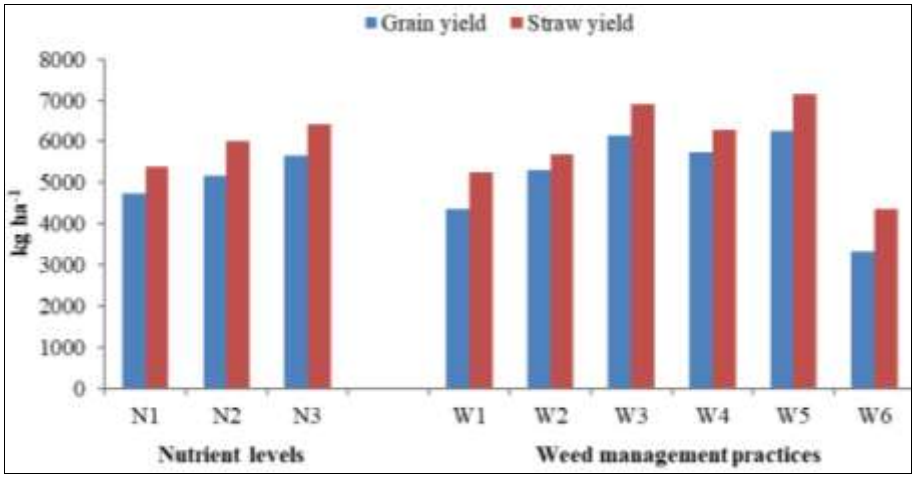

Fig 1: Grain and straw yield (kg ha^{-1}) of transplanted rice as influenced by nutrient levels and weed management practices (pooled data of two years)

Dry matter production of zero till maize

Nutrient levels and weed management were significantly differed the dry matter production of zero till maize at harvest (Table 2). Significantly higher dry matter production was obtained with 125% RDF (N_1). Enhanced growth of maize under better supply of nutrients might have increased the photosynthetic area, resulting in the form of higher plant height and leaf area index leading to higher dry matter production. These results were in close association with findings of Deewan *et al.* (2018) [6]. The next best nutrient level was 100% RDF (N_2), which was significantly superior to 75% RDF (N_3), which was lower than rest of nutrient levels.

Among the weed management practices, higher dry matter production was obtained with HW twice at 20 and 40 DAS (W_5), which was statistically comparable with PoE application of mesotrione + atrazine 875 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_4). This might be due to effective control of all the categories of weeds during the entire crop growing period might have produced better stature of crop as reflected by taller plants, higher leaf area index and enhanced photosynthates, which in turn resulted in higher dry matter production. Similar findings were also reported by Harisha *et al.* (2023) [7] and Wasnik *et al.* (2022) [18]. The next best weed management practice was PoE application of halosulfuron-methyl 67.7 g ha^{-1} + tembotrione 100 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_3), which was significantly superior to PoE application of halosulfuron-methyl 67.7 g ha^{-1}+ ethoxysulfuron 20 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_2) and PoE application of topramezone 25.2 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_1) with significant disparity later two. Significantly lower dry matter production was recorded with unweeded check (W_6). This may be owed to more absorption of water and nutrients by the weeds than crop during the entire growing period leading to lower plant height, LAI and ultimately the dry matter production.

Nutrient uptake by zero till maize

Nutrient uptake *viz.*, nitrogen, phosphorus and potassium by zero till maize at harvest were significantly influenced by nutrient levels and weed management practices (Table 2). Significantly higher nutrient uptake *viz.*, nitrogen, phosphorus and potassium by zero till maize was recorded with application of 125% RDF (N_1) followed by 100% RDF (N_2). This might be due to higher application of nutrients that enhanced the mineralization process, which inturn increased the availability of nutrients that led to an increased nutrient uptake by the crop. The results obtained in this study are in line with the findings of Shid *et al.* (2022) [17] and Ram *et al.* (2023) [16]. The lowest nutrient uptake was resulted with 75% RDF (N_3), which was significantly lesser than rest of the nutrient levels.

With regards to weed management practices, higher nutrient uptake *viz.*, nitrogen, phosphorus and potassium by zero till maize was observed with HW twice at 20 and 40 DAS (W_5), which was statistically at par with PoE application of mesotrione + atrazine 875 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_4). This might be due to higher crop dry matter production and higher nutrient uptake in corresponding treatments because of reduced competition for nutrient uptake. The nutrient uptake by crop and associated weeds follow an inverse relationship grown in a community. These results were in accordance with the findings of Deewan *et al.* (2018) [6] and Kumar *et al.* (2017b) [11]. The next best weed management practice in recording higher nutrient uptake was PoE application of halosulfuron-methyl 67.7 g ha^{-1} + tembotrione 100 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_3), which was significantly superior to PoE application of halosulfuron-methyl 67.7 g ha^{-1} + ethoxysulfuron 20 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_2) and PoE application of topramezone 25.2 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_1) with significant disparity between the later two. Significantly lower nutrient uptake was registered with unweeded check (W_6), this might be due to heavy weed infestation that resulted in increased competition for growth resources, which in turn reduced the growth parameters, dry matter production.

Kernel and stover yield o zero till maize

Kernel and stover yield of maize differed significantly with different nutrient levels and weed management practices (Fig. 2). Among the various nutrient levels, significantly higher kernel and stover yield was recorded with the application of 125% RDF (N_1), which was superior to rest of the nutrient levels. Précised application of nutrient levels might be accountable for amplifying yield parameters and in turn the yield. This was in consonance with the findings of Naveen *et al.* (2023a) [14]. The next best nutrient level in recoding higher kernel and stover yield was 100% RDF (N_2) followed by 75% RDF (N_3), which was significantly recorded the lowest kernel yield. This might be due to poor availability of nutrients, which led to deflated stature of growth parameters, yield attributes and finally lower yields.

Among the weed management practices, higher kernel and stover yield of zero till maize was observed with HW twice at 20 and 40 DAS (W_5), which was statistically comparable with PoE application of mesotrione + atrazine 875 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_4). This might be due to lower crop weed

competition for growth resources throughout the crop growing period enabling the crop for maximum utilization of resources, which enhanced the vegetative and reproductive potential of the crop that might have reflected in the form of higher yields of zero till maize. The results corroborates with the findings of Harisha *et al.* (2023) [7], Balaji *et al.* (2022) [3] and Chhokar *et al.* (2019) [5]. The next best weed management practice was PoE application of halosulfuron-methyl 67.7 g ha^{-1} + tembotrione 100 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_3) which was significantly superior to PoE application of halosulfuron-methyl 67.7 g ha^{-1} + ethoxysulfuron 20 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_2) and PoE application of topramezone 25.2 g ha^{-1} at 20 DAS *fb* HW at 40 DAS (W_1) with significant disparity between the later two. Unweeded check (W_6) recorded significantly lower kernel and stover yield. This might be due to greater competition for growth resources among the crop and weeds as evident by the lowest crop stature, lesser dry matter production, which impoverished partitioning efficiency of assimilates from source to sink that lead to diminished yield attributes and yield of maize.

Table 2: Dry matter production and nutrient uptake (kg ha^{-1}) of zero till maize at harvest as influenced by nutrient levels and weed management practices (pooled data of two years)

Treatments	Dry matter production (kg ha^{-1})	Nutrient uptake (kg ha^{-1})		
		Nitrogen	Phosphorous	Potassium
Nutrient levels (N)				
N_1 : 125 % RDF	11039	164	31.2	166
N_2 : 100 % RDF	9814	148	28.5	150
N_3 : 75 % RDF	8362	132	25.6	134
SEm±	**124.5**	**3.6**	**0.61**	**3.8**
CD (P=0.05)	**489**	**14**	**2.4**	**15**
Weed management practices (W)				
W_1 : PoE application of topramezone 25.2 g ha^{-1}at 20 DAS *fb* hand weeding at 40 DAS	8845	129	24.2	131
W_2 : PoE application of halosulfuron-methyl 67.7 g ha^{-1} + ethoxysulfuron 20 g ha^{-1} (tank-mix) at 20 DAS *fb* hand weeding at 40 DAS	9660	144	27.1	146
W_3 : PoE application of halosulfuron-methyl 67.7 g ha^{-1} + tembotrione 100 g ha^{-1} (tank mix) at 20 DAS *fb* hand weeding at 40 DAS	10769	161	29.8	164
W_4 : PoE application of mesotrione + atrazine 875 g ha^{-1} (ready mix) at 20 DAS *fb* hand weeding at 40 DAS	11553	179	35.2	182
W_5 : Hand weeding twice at 20 and 40 DAS	11962	186	36.5	188
W_6 : Unweeded check	5640	89	17.9	91
SEm±	**209.3**	**3.6**	**0.52**	**3.6**
CD (P=0.05)	**604**	**10**	**1.5**	**10**

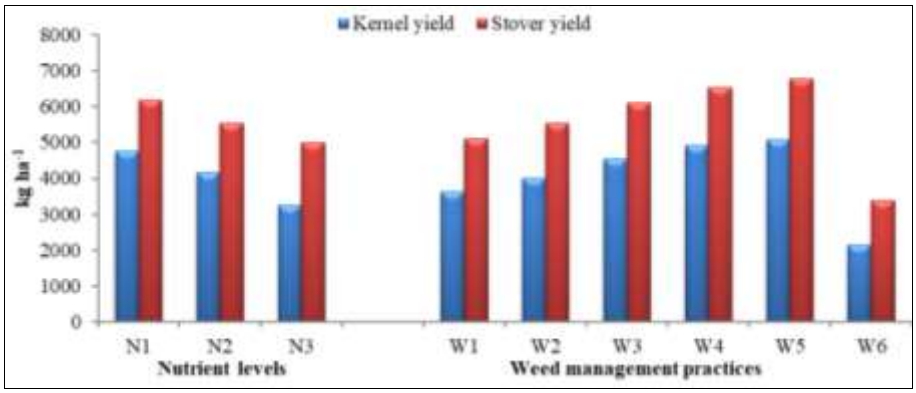

Fig. 2: Kernel and stover yield (kg ha^{-1}) of zero till maize as influenced by nutrient levels and weed management practices (pooled data of two years)

Conclusion

From the results it can be concluded that, in transplanted rice, significantly higher dry matter production, nutrient uptake and grain and straw yield were obtained with the application of 150% RDF. Among the weed management practices tested, higher dry matter production , nutrient uptake and grain and straw yield were recorded with HW twice at 20 and 40 DAT, which was at par with PE application of triafamone + ethoxysulfuron 67.5 g ha^{-1} *fb* halosulfuron-methyl 67.7 g ha^{-1} + fenoxaprop-p-ethyl 60 g ha^{-1} at 20 DAT. In zero till maize, significantly higher dry matter production, nutrient uptake and kernel and stover yield were obtained with the application of

125% RDF. With regards to different management practices, higher dry matter production, nutrient uptake and kernel and stover yield were recorded with HW twice at 20 and 40 DAS, which was statistically comparable with PoE application of mesotrione + atrazine 875 g ha^{-1} at 20 DAS *fb* HW at 40 DAS on sandy clay loam soils of Southsern Agro-Climatic Zone of Andhra Pradesh.

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