The agronomic response of the dry rice toward fertilized plantation on wetland

[1]La O. M. J. Silea, [2]Sahta Ginting, [3]Sarawa Mamma, [4]La O. Safuan

[1] Department of Plant Science, Dayanu Ikhsanuddin University, Baubau, Indonesia; [2] Department of Soil Science, Halu Oleo University, Kendari, Indonesia; [3] Department of Plant Physiology, Halu Oleo University, Kendari, Indonesia; [4] Department of Plant Physiology, Halu Oleo University, Kendari, Indonesia. Corresponding author: L. O. M. J. Silea, lmjalilsilea@yahoo.com

Abstract. The dry rice cultivation in the dry land underwent difficulties such as the low soil fertility, the limitedness of water supply, and the limited harvest frequencies with low production. To overcome these inconveniences, the dry rice can be planted in wetlands with addition of organic and inorganic fertilizers. The present research aimed to determine the agronomic response of the dry rice planted in the rice fields (without flooding) and supplied with organic and inorganic fertilizers. The research method used the Split Plot design. The research was conducted in the field (paddy), Baubau City, Indonesia. The results showed a better response of growth in the wetlands seen from several agronomist parameters. There was no interaction between organic and inorganic fertilizer. The increase of doses of the inorganic fertilizers showed a yield increase on each growing parameter observed. The best dose was 250 kg Urea + 125 kg SP-36 + 100 kg KCl and 8 t ha^{-1} organic fertilizer. The production achieved was 20.63 t ha^{-1} of dry milled grain.

Key Words: wakawondu variety, bokhasi, semi-arid land, organic fertilizer, inorganic fertilizer.

Introduction. So far, the dry rice cultivation by the farmers has been done on the dry land (*field*) when the rainy season came. The dry and semi-arid land of the humid tropics of Southeast Sulawesi, Indonesia was dominated by the type of land belonging to the Alfisol, Ultisol, and Oksisol. The Ultisol and Oksisol soil types were generally found in the humid regions which underwent the high weathering and leaching level. In addition, the phosphors and anions were fixed strongly, the water content and the soil water storage capacity was low and vulnerable to the erosion. The feature or characteristics like this might lead the productivity or the low soil fertility, so it becomes a constraint in improving the plant productivity. Therefore, the effort required to restore the soil fertility by using fertilizer. The organic fertilizer could improve the physical and chemical properties of land as described in a research conducted by Djamaluddin (1985) that the granting of the chicken manure approximately 5 t ha^{-1} plus 50 kg TSP provided the nutrient uptake of N, P and K as well as the provision of 100 kg TSP without manure application.

Several studies on the use of organic and inorganic fertilizers on the growth and production of upland rice have been studied among others by Rover (2014) that the treatment of inorganic and organic fertilizers mixture gives a real impact on the amount of grain $panicle^{-1}$, dry grain weight $clump^{-1}$, and dry weight of plants (roots, stems, leaves). Further, Ade et al (2015) reported that the fertilization of 50% organic and 50% inorganic fertilizer of recommended doses is the best treatment to the plant height and number of tillers $clump^{-1}$ plant of upland rice. The result presented by Edward (2014) concluded that the use of fertilizer of KCl from 100 kg ha^{-1} can increase the production of upland rice. Other study result indicates that the use of Urea 100 kg ha^{-1} significantly increased 'Pendok' local varieties production of upland rice which reached 7.08 ton ha^{-1} of milled rice (Zainal et al 2012). Sugiyanta (2007) concluded that the real nitrogen fertilizer increased plant height, number of productive tiller, the production of grain, panicle length. Silea (2015) concluded that the Buton local Upland rice of 'wakawondu'

verity has good tolerability compared with 'wangkariri and wakombe' varieties if cultivated in wetlands (paddy).

In addition, the limitedness of the water on the dry land did not enable to be done for years because it only relied on the rainfall as the source of water to fulfill the growth needs of the upland rice crop. One of the alternatives to overcome the problem of water stress on the upland rice cultivation in the dry land was to cultivate in the wetlands (paddy) and with addition of organic fertilizer with the right dosage to improve the productivity.

This research aimed to determine the agronomic response of the upland rice of the wakawondu variety as the local variety in Buton Island with application of bokhasi, and NPK fertilizers planted on wetlands. Bokhasi is fermented cow manure.

Material and Method. The materials used in this research are: local rice seed of wakawondu variety, bokhasi, fertilizer of N, P, K, aluminum foil, plastic insulation, net, plastic polyetilene with the size of 60 x 60 cm, which is used as a fence to prevent the entry of rats, tarpaulin which is used as a container for fermenting manure.

The tools used in the research are: thermometer, pH meter, analytical balance, oven, digital camera, composters, compost fork, hand tractor, label, and bucket with the a capacity of 25 kg, yells, hoes, meter, trays, machetes, knives, soil analysis tools, and stationery. The experiment was conducted in the field and lasted from May to December 2016.

The experiments used the split plot design in a randomized block design which consisted of two factors: the first factor was bokhasi cow dung (A) as the main plot, consisted of five levels, the dosages of 0 ton ha^{-1} (A0), the dosage of fertilizer 2 tons ha^{-1} (A1), the dosage of fertilizer 4 tons of ha^{-1} (A2), the dosage of fertilizer 6 tons ha^{-1} (A3), the dosage of fertilizer 8 tons of ha^{-1} (A4). The second factor was the inorganic fertilizer plot (B) consisted of five levels, namely 0 kg of Urea + 0 kg of SP-36 + 0 kg of KCl (B0); 62.50 kg 31.25 kg of Urea + SP-36 + 25 kg of KCl (B1); 125 kg of Urea + 62.50 kg of SP-36 + 50 kg of KCl (B2); 187.50 kgs of Urea + 93.75 kg of SP-36 + 75 kgs of KCl (B3); 250 kg of Urea + 125 kg of SP-36 + 100 kg of KCl (B4). Thus, it will be obtained about 25 combinations of treatment. Each combination of treatment was repeated for three times so that there are 75 experimental units totally. The number of plots used about 75 plots on each experimental unit by using 20 plants with the distance of plants about 25 x 30 cm, consisting of 1,500 units of plants totally.

The Urea fertilizer is given for twice, namely at the age of 7 days after planting (DAP) and at 35 DAP. SP-36 fertilizer is given during the processing of land, whereas the KCl is given for 3 times, 1/3 is given at the time of processing of the soil along with the SP-36 fertilizer, 1/3 at age of 35 DAP, and 1/3 at the age of 70 DAP. Based on the experiments of land volume used namely 1.0 x 1.5 m^2 for each plot of the experiment, the dosage of each plot was 0 g of urea + 0 gr of SP-36 + 0 g of KCl (B0); 9.37 gs of urea $plot^{-1}$ + 4.68 g of SP-36 $plot^{-1}$ + 3.75 g of KCl $plot^{-1}$ (B1); 18.75 g of urea $plot^{-1}$ + 9.37 g of SP-36 $plot^{-1}$ + 7.5 g of KCl $plot^{-1}$ (B2); 28.12 g of urea $plot^{-1}$ + 14.06 g of SP-36 $plot^{-1}$ + 11.25 g of KCl $plot^{-1}$ (B3); 37.50 g of urea $plot^{-1}$ + 18.75 g of SP-36 $plot^{-1}$ + 15.0 g of KCl $plot^{-1}$ (B4). For the 'bokhasi cow dung', the dosage of each mapping is 0 g $plot^{-1}$ (A0), 300 g $plot^{-1}$ (A1), 600 g $plot^{-1}$ (A2), 900 g $plot^{-1}$ (A3), and 1.200 g $plot^{-1}$ (A4).

The growing parameter of the vegetative plant includes:

1) The number of young plants. Calculated all the numbers of young plants formed.
2) The volume of leaf. The volume of leaf was measured by the method of the length and the width. The measurement of the volume of leaf was done the third leaf from the top, then in the middle of the leaf, and the third leaf from the bottom. The third volume of sample leaf was measured and then averaged. The formula used is:

$$V = L \times W \times C$$

Where: V = volume of leaf;
L = length of leaves;
W = width of leaves;

C = constant (0.78).

The generative growing parameter observed includes:

3) The number of productive tillers. Calculated all the numbers of seedlings which produces panicles.
4) The number of grains per panicle. Calculated for all items that are formed on each panicle.
5) The weight of 1,000 grains (g) after harvest. The measurements were done by weighing the weight of 1,000 grains after drying the water content of 14%.
6) The productivity of grain yield (t ha^{-1}) of milled rice (GKG). Calculated by using the formula: Total clump x number of productive tillers x number of grains per panicle x weight / 1,000 grains at the water content of 14%.

Statistical analysis. To know the effect of all treatments, the Analysis of Variance (ANOVA) used, if it is different from the reality, the Duncan's multiple range test used at the level of 5% by using the software package SPSS 17.0 for Windows (SPSS Inc., Chicago, IL). In graphs and figure, the original data and their standard errors are presented.

Results and Discussion

The number of young plants per clump. Based on the results of statistical analysis, it showed that the organic fertilizer and their interaction with inorganic fertilizers did not give any real effect on the number of young plants on 8 weeks after planting (WAP) (Table 1), but independently, the inorganic fertilizer application gives the significant influence among inorganic fertilizer treatment.

Table 1

Provision of organic and inorganic fertilizers against the number of young plants on the age of 8 WAP

Treatment	*Average*	*Results*
Organic fertilizer		
A0	37.30	a
A1	34.53	a
A2	33.60	a
A3	35.51	a
A4	35.17	a
Inorganic fertilizer		
B0	29.97	a
B1	34.24	ab
B2	34.75	ab
B3	36.71	ab
B4	40.45	b

The number followed by the same letter in the same column indicates insignificant difference based on a confidence level of DMRT 95%.

Table 1 show that the dosage of organic fertilizer at dosage up to 8 t ha^{-1} has not provided a significant effect. This is due, at the dosage used merely to provide the nutrients to the soil either micro or macro, but it is not yet optimal absorbed by the plants to support the growth and development of plants. The use of inorganic fertilizer given at all dosages did not show significant difference on the number of tillers formed, except between B4 treatment showed significant difference without any fertilizer (B0). The highest number of young plants was provided by the fertilizer with the dosage of 250 kg of Urea + 125 kg of SP-36 + 100 kg of KCl (B4).

The data in Table 1 shows that the higher the dosage of inorganic fertilizer applied the higher the increase of the number of tillers clumps of rice, but statistically, the dosage of N, P, K fertilizers at the B1 to B4 levels did not show any significant difference.

This fact describes that the rice of wakawondu varieties strongly responds toward the fertilization though in low dosage. The response is shown by the increase in the number of young plants with the increase of fertilization levels. However, the inorganic fertilizer with the B1 level (62.50 kg of urea + 31.25 kg of SP-36 + 25 kg of KCl) was enough to encourage the growth of the number of young plants of rice. This happens because of N, P, K fertilizers as macro nutrients can already supply sufficient nutrients in the soil, so that the increase of fertilizer dosage has revealed the increase of the response of 'wakawondu' rice plants. The sufficient availability of N in the soil will quickly respond to the vegetative growth of the plants. In the vegetative stage, the plants actively absorb the nutrients like N. the P and K as well as other micro compounds. The plants absorb N in the form of nitrate ions (NO_3^-) and ammonium (NH_4^+), both of which have been available in the soil or from the fertilizer. Larcher (1995) reported that the nitrogen is absorbed and then converted in the form of nucleic acids and amino acids for protein biosynthesis and both vegetative and generative growths.

Volume of leaf. The results of statistical analysis showed that the organic fertilizer and their interaction with inorganic fertilizer do not have a significant effect on the volume of leaf at 10 WAP (Table 2), but independently, inorganic fertilizer application provides significant effect.

Table 2

Provision of inorganic fertilizers against the volume of leaf at the age of 10 WAP

Treatment	*Average*	*Results*
B0	28.35	a
B1	31.10	ab
B2	31.63	ab
B3	34.98	b
B4	35.48	b

The number followed by the same letter in the same column indicates insignificant difference based on a confidence level of 95%.

Table 2 shows that the inorganic fertilizer given to B0, B1, and B2 did not show a significant difference to the volume of leaf. Similarly, between B1, B2, B3, and B4 did not have statistically significant difference, except in the treatment between B0 to B3 and B4 real treatment gives a different response. In this research, it is suggested that the nutrient needs a dosage of B2 to B4 tend to approach the appropriate level (sufficient and balanced) thereby increasing the vegetative and generative growth of rice plants in semi-wet lands. As pointed by Schulze & Caldwell (1995), the urea fertilizer with an appropriate dosage will increase the content of N in the rhizosphere, optimize the deployment of N evenly and stimulate the absorption and utilization of N efficiently. On the other hand, the excessive urea would be toxic to the plant so that it will interfere with the stage of development of vegetative and generative (Zheng et al 2007). In this research, the higher are the nutrient given (N, P, K), the higher is the increase of the length and the width of leaves. The variables of length and width are those variables to determine the volume of leaf. The nitrogen on plants functioned in expanding the areas so as to increase photosynthesis (Chaturvedi 2005) for the formation of biomass plants. Nevertheless, until the dosage of B4, the volume of leaf was positively correlated with the increase of the dosage of fertilizer. This correlates with the ability of plant photosynthesis. Finally, it correlates well with the production of carbohydrates, fats, oils and it ultimately increases the volume of leaf.

Productive young plants. Based on the results of statistical analysis, it showed that the organic fertilizer and their interaction with inorganic fertilizer did not have a significant effect on the number of productive young plants at the age of 10 WAP (Table 3), but independently, inorganic fertilizer application has significant effect.

Table 3

Provision of inorganic fertilizers against productive young plants at the age of 10 WAP

Treatment	*Average*	*Results*
B0	16.21	a
B1	18.71	b
B2	20.29	b
B3	21.04	b
B4	23.69	c

The number followed by the same letter in the same column indicates insignificant difference based on a confidence level of 95%.

Table 3 shows that all levels of inorganic fertilizer dosage given was significantly different without fertilizer (B0) to the number of productive young plants formed. The most numbers of productive young plants were obtained in B4 treatment. The higher the dosage of fertilizer given, the higher the increase of the number of young plants of the clumps of rice, but it was based on the DMRT dosage of N, P, K fertilizers (B1 to B4) dosage did not show any significant difference. This fact illustrates that the manure and fertilizer of N, P, K can increase the vegetative growth of rice plants (the plant height and number of young plants per clump). This happens because of the manure and fertilizer of N, P, K can provide macro and micro nutrients in the sufficient quantities, balanced for the growth and development of plants. With the addition of organic nutrient that provides micro elements, so the plant needs to support the growth and development of the rice plant can be obtained. The micro elements in the organic material in the form of 'Ca' strongly played a role in activating the formation of root hairs and reinforcing rods, the element 'S' helped in the formation of amino acids, and helps the other growth process, there is also available 'Fe, Zn' micro nutrients and absorbed by the plants for the growth of vegetative plants.

In this research, the increase of N, P, K showed the increase of the number of productive young plants formed. Behold, phosphorus has a bigger role in the generative phase compared with the vegetative phase. According to Winarso (2005), 'P' uptake when the vegetative phase of not more than 10% to 90% of nutrient 'P' absorbed during its growth phase are generative. The combination of nutrients N, P, K affects the number of productive young plants. With more and more P added in the soil allows the more the number of productive young plants. The combination of the treatment in inorganic fertilizer with complete macro nutrients (N, P, K and S) was able to increase the number of productive young plants. The number of productive tillers affects the production of grain produced. With the number of productive young plants were many then the panicles produced will be more and more, which will ultimately increase the grain production.

The increase of the number of young plants was positively correlated with increase of uptake of nutrients available. The higher the uptake, the more productive young plants were formed to reach the optimum level. The optimum point was affected by the genetic and environmental factors of the plant growth.

The number of grains per panicle. The results of statistical analysis showed that the organic fertilizer and their interaction with inorganic fertilizers give the unreal effect on the number of grains per panicle. Independently, the inorganic fertilizers give a significant effect on the number of grains per panicle (Table 4).

Table 4 shows that all levels of inorganic fertilizer dosages given significantly different results without fertilizer (B0) to the number of productive young plants formed, except in the treatment between B1 and B0 where did not show a significant difference. The highest number of grains obtained in the treatment of B4 though it was not significant with B3. The data illustrates that the higher the dosage of fertilizer applied, the higher the increase of the number of grains per panicle. However, the dosage at B3 with 187.50 kg of Urea + 93.75 kg SP-36 + 75 kg of KCl seems to be sufficient to obtain the amount of grain and was economically profitable. Although it did not indicate a

significant response but with the addition of the organic nutrients such as cow dung bokhasi providing micro elements, the absorptive capacity of the soil macro elements would increase and the crop needs to support the growth and development can be obtained.

Table 4

Provision of organic and inorganic fertilizers against the grain number per panicle

Treatment	*Average*	*Results*
B0	101.62	a
B1	108.23	ab
B2	113.70	bc
B3	120.20	cd
B4	125.78	d

The number followed by the same letter in the same column indicates insignificant difference based on a confidence level of 95%.

In this experiment, the provision of macro nutrients such as N, P, and K increased showed the increase of the number of grains per panicle formation. It means the phosphorus has a bigger role in the generative phase compared with the vegetative phase. According to Winarso (2005), about P uptake is when the vegetative phase was not more than 10% to 90% of nutrient P absorbed during its growth phase are generative. With more P added in the soil, the more the number of grains formed in each panicle. The phosphourus in the plants has a very important function in the process of photosynthesis, respiration, transfer and storage of energy, as well as the division and enlargement processes of cell in other plants. The phosphorus improved the quality of fruits, grains and very important in the formation of seeds. The phosphorus helps accelerating the development of roots and germination, can increase the efficiency of water use, and increase the resistance to the disease that ultimately improved the quality of the crop.

The combination of the treatment of organic fertilizer with complete macro nutrients (N, P, K) were able to increase the number of productive young plants. The number of productive young plants affects the production of grain produced. With the big number of productive young plants, so the panicles produced would be more and more, which would ultimately increase the grain production.

Weight of 1,000 grains of dry unhusked rice. Based on the results of statistical analysis, it showed that the organic and inorganic fertilizers had a significant effect on the weight of 1,000 grains (Table 5), but the interaction between organic and inorganic fertilizers did not give significant effect on the grain weight of dry grain.

Table 5

Provision of organic and inorganic fertilizers against the grain weight 1,000 grains dry milled

Treatment	*Average*	*Results*
	Organic Fertilizer	
A0	27.81	a
A1	28.94	b
A2	29.00	b
A3	29.45	c
A4	29.71	c
	Inorganic Fertilizer	
B0	7.86	a
B1	28.51	ab
B2	29.04	abc
B3	29.41	bc
B4	30.08	c

The number followed by the same letter in the same column indicates insignificant difference based on a confidence level of 95%.

Table 5 shows that the higher the dosage of organic fertilizer, the higher the weight of grain produced. All tested dosages of fertilizers were significantly different from the treatment without dosage (A0). Dosing 6 tons of ha^{-1} did not show a significant difference at the dosage of 8 tons/ha^{-1}. At the dosage of 6 tons/ha^{-1} was the ideal dosage given because it was more economical in terms of cost and the resulting response was not significantly different from the dosage of 8 tons/ha^{-1}. Similarly, the inorganic fertilizer was given that the higher the dosage of fertilizer applied, the better the resulting grain weight. The B3 treatment was actually the best dosage given to the inorganic fertilizers to 'wakawondu' cultivars rice cultivated in the paddy fields. Although B3 was not significantly different from B4, but it was economically more desirable than that of the recommended dosage. This suggests that organic fertilizers can reduce the dosage of inorganic fertilizer to 25%. The results of Sebayang et al (2004) concluded that the productivity of rice crops was higher when the inorganic fertilizer was combined with organic fertilizer. The increase of phosphorus fertilization tended to increase the weight gain of dried grain. According to Winarso (2005), most of the P would be mobilized to plant seeds or fruit after entering the generative phase. The establishment of rice grains are affected by nutrient uptake, resulting from organic fertilizers will increase the supply of nutrients in the amount available. The elements of N, P and K absorbed by the plants were initially used to support the vegetative growth such as the plant height and young plants increase, then the generative growth phase of these elements were used for the formation of flowers and seeds of paddy rice crops. This is why, the more the elements were absorbed, the more the increase of the formation of rice grain.

Production. Based on the results of statistical analysis, it showed that there was no interaction between organic and inorganic fertilizers to the amount of the resulting production. However, independently, the giving of organic and inorganic fertilizers had a significant effect on the level of production achieved (Table 6).

Table 6

Provision of organic and inorganic fertilizers against total production produced (tons of ha^{-1})

Treatment	*Average*	*Results*
	Organic fertilizer	
A0	13.08	a
A1	14.38	ab
A2	15.36	b
A3	18.06	c
A4	20.41	d
	Inorganic fertilizer	
B0	12.02	a
B1	14.27	b
B2	16.97	c
B3	17.40	c
B4	20.63	d

The number followed by the same letter in the same column indicates insignificant difference based on a confidence level of 95%.

Table 6 shows that independently, the treatment of A4 was the best treatment in generating the production of milled rice. Similarly, the B4 for inorganic fertilizer was the best treatment. Although it did not show a significant difference, but the best interaction was shown by the treatment of A4B4. The high production in the rice plants in response to the application of organic and inorganic fertilizers along with increased nutrient uptake, increased vegetative growth, and increased variable production. This is possible because the organic material has decomposed carefully. Fadiluddin (2009) stated that the yield and yield components were the results of the vegetative growth of rice plants. The use of organic manure combined with inorganic fertilizer significantly increases the crop production of upland rice in the paddy field. According to the result of Sebayang et

al (2004), the high productivity of rice crops derived from the treatment of inorganic fertilizers combined with organic fertilizer. The DMR test of the level of 5% was known that with the addition of organic matter about 8 tons/ha^{-1} significantly increased the production of dry grain/ha^{-1}. Similarly, the giving of inorganic fertilizer (250 kg of urea + 150 kg of SP-36 + 100 kg of KCl) to generate real weight of dry grain were higher and significantly different from the treatment of B0, B1, B2, and B3. The research data showed that the higher the dosage given, the higher the increase the weight of dry milled grain.

The main purpose of applying N fertilizer in rice plants was to increase the yield of dry matter. Usually plants take 30-70% of N given depending on the type of plant, the rate and amount of N supplied (Englestad 1997). Allegedly uptake N has a strong correlation with the weight of dry milled grain. According to Kamsurya et al (2002), with only urea fertilizer had actually been able to increase the weight of dry milled grain. The urea fertilizer was able to provide 46% N. However, the effect would be more effective if it was given in balance with other fertilizers. This fact showed that the role of organic matter was very good in providing the nutrients and helped the increase of the uptake of N, P, K which was necessary for the growth and yield of rice. These data also illustrated that the dry rice 'wakawondu' variety had a very good response to fertilization, both organic fertilizers and inorganic fertilizers. In fact, the adaptability and genetics showed a variety capable of very high production if cultivated in semi-wet lands.

The role of micro elements contained organic material in addition to providing the needs of rice plants for the growth and development, they also played a role in increasing the cation exchange capacity (CEC) of the soil so that the macro elements (N, P, K) mobilized properly and releasing the cations adsorbed colloid land so that they were available for the plants to absorb. Plants that grow can grow normally also require secondary nutrients but generally not as much as compared to the primary nutrients.

One of the factors that determine the weight of dry milled grain was the content of nitrogen in the soil. According to Buckam & Brady (1982), on cereal crops, the nitrogen enlarged the grain size and increased the percentage of protein in the seeds. The inorganic fertilizer was able to provide high nitrogen content which is easily absorbed by plants. The availability of nitrogen after blossoming can increase the seed weight. The nitrogen served in filling the seed, if the nitrogen needs can be met well at the beginning of the reproductive phase increases seed weight. The increase of the dosage of P fertilizer, causing an increase in the grain weight per clump. If the plant has entered the generative phase, the majority of P is immobilized to the seeds or fruits and other plant generative parts. The P content of generative parts of plants (seeds) was higher compared with other plant parts (Winarso 2005). The provision of phosphorus would be able to increase the weight of the seed. Phosphorus was a constituent of phospholipids, nucleoprotein and which then would be stored in the seed lot. The phosphorus had a very active role in transferring the energy within the cell; it also served to convert the carbohydrate (Hakim et al 1986) so that the weight of the seed increased.

The addition of K through KCl fertilizer affects the weight of dry milled grain. The K played a role in strengthening the stems of plants. With the fulfillment of the elements K levels in the plant, and then the plant would get stronger, so that it was not easy to undergo the lodging. With fewer plants fell down, the higher the production of grain increased. The potassium also affects the weight of the seed. The potassium worked to increase the size and the weight of grain (Gardner et al 1991). According to Roesmarkam & Yuwono (2002), besides requiring the nutrient, the seed formation also required water in sufficient quantities. Various factors affected the H_2O, CO_2, light, nutrients, and temperature, as well as age and genetics of plants. The most limited factors about the natural or agricultural ecosystems to the high plants were the availability of water. When the negative water potential (water becomes limited), the enlargement of cells initially slowed down, so the growth decreased. With just a little increase of water stress, stomata began closing and the CO_2 capture was inhibited. So, the photosynthesis was hampered by the water because of the enlargement of leaves and slow the absorption of CO_2 was inhibited.

Conclusions. Agronomically, the dry rice variety 'wakawondu' planted in the wetlands non puddle showed good response to all parameters of growth, also responds well to fertilization. All agronomic parameters tested show that increasing doses of inorganic fertilizers tends to increase traits values. The effect of the organic fertilizer during the growth and development of upland rice plants was observed on the generative phase, namely on the weight of 1000 grains and crop production. Although it does not indicate a pattern of interaction between organic and inorganic fertilizers, but independently, the highest production reached 20.63 t ha^{-1} of dry milled grain namely the treatment of 37.50 g of urea $plot^{-1}$ + 18.75 g of SP-36 $plot^{-1}$ + 15.0 g of KCl $plot^{-1}$ (B4). To bokhasi cow dung best dosage is of 8 t of ha^{-1} (A4) with the production performance of 20.41 t ha^{-1} of the dry milled grain.

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Authors:
La Ode Muhammad Jalil Silea, Dayanu Ikhsanuddin University, Department of Plant Science, Indonesia, Baubau, Jalan Sultan Dayanu Ikhsanuddin, 178, Postal Code 93722, e-mail: lmjalilsilea@yahoo.com
Sahta Ginting, Halu Oleo University, Department of Soil Science, Indonesia, Kendari, Campus Bumi Thri Dharma, Anduonohu, e-mail: sahta_ginting@yahoo.co.id
Sarawa Mamma, Halu Oleo University, Department of Plant Physiology, Indonesia, Kendari, Campus Bumi Thri Dharma, Anduonohu, e-mail: sarawa60@yahoo.com
La Ode Safuan, Halu Oleo University, Department of Agrotechnology, Indonesia, Kendari, Campus Bumi Thri Dharma, Anduonohu, e-mail: safuan65@yahoo.co.id

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