Impacts Minimum Number Of Combination On Farm Man-Days And Fertilizer Dosage Application To Rice (Oryza Sativa.L) Grain Yield In Sub District Majalaya, Karawang Regency On Covid-19 Pandemic Period

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ABSTRACT

This study aims to know minimum number of a combination on farm man-days and fertilizer dosage used to rice (Oryza Sativa.L) grain yield on Large Scale Social Distancing (LSCD) period implemented caused by Covid-19 pandemic in Karawang Regency the research was conducted in Majalaya village, Karawang Regency from August to December 2020. An experimental method had been carried out based on a randomized block design which consisted of three number on farm man-days used combined by three dosage of fertilizer treatments, i.e., T1 (number man-days 100%+ dosage fertilizers 100%), T2 (number man-days 100% + dosage fertilizers 80%), T3 (number man-days 100%+ dosage fertilizers 60%), T4 (number man-days 80%+ dosage fertilizers 100%), T5 (number man-days 80%+ dosage fertilizers 80%), T6 (number man-days 80%+ dosage fertilizers 60%), T7 (number man-days 60%+ dosage fertilizers 100%), T8 (number man-days 60%+ dosage fertilizers 80%), T9 (number man-days 60%+ dosage fertilizers 60%). There were 3 times replication. Observed variable was rice grain yield (tons/hectare). Results indicated that the aplication at T1 to T9 significantly different to almost all obeserved variable and application at T1 (5.85 tons/hectare) was the best, but it was not significant to T4 (5.80tons/hectare). Suggestion for rice farmers in around of Karawang Regency, that rice farming feasibles on New Normal Adaptation Period by minimum number on farm man-days used must be more than 80% recommended man-days used and 80% of fertilizer dosage fertilize standard application.

Keyword: Covid-19 pandemic, rice, man-days, fertilizer, grain yield

INTRODUCTION

Rice (Oryza sativa L.) is a food crop consumed by most of the world population. Rice belongs to the family Poaceae (Graminae) and subfamily Oryzoidea. Rice is produced in about 42 countries and recognized as staple food some countries in continent of Asia, America, Africa, and serve as a primary source of food for more than a billion of the world's population. The world rice market is only 7 per cent of global production as internationally traded, and most of the rice produced is consumed domestically (FAO, 2012). Asia, where about 90 per cent of rice is grown, has more than 200 million rice farms, most of which are smaller than one hectare of field rice area (FAO, 2012). The global area of rice was 157.46 million hectares, with a production of 758.9 million tons and rice grain yield of 4.46 tons/ha respectively in 2017 (FAO, 2017). China was the leading country of rice producer followed by India, Indonesia and Bangladesh in 2014-15 (www.agricoop.nic.in). Indonesia is ones of rice producer country in the world. In 2019, rice was cultivated on 10.68 million hectares with a mild dry paddy production as rice grain yield of 54.6 million tons equal a rice production of 32.76 million tons and a paddy rice grain yield of 5.11 tons / ha. In 2019, in Karawang Regency, rice was cultivated on 185,807 hectares with a mild dry paddy production of 1.117 million tons equal a rice production of 641,290 tons and paddy rice grain yield of 6.02 tons / ha (BPS,2020). In 2019, Indonesia rice stock of 2.7 million tons, and Karawang Regency contributed Indonesia rice stock of about 400,000 tons, equal 15 percent (BPS,2020).

Karawang Regency is one of regencies in Indonesia as a productive regency of rice production and it known as granary of rice. A part area in northern of Karawng regency, suitables for optimum growth of rice caused by geographic position, environmental climate, soil, irrigation and skilled farmers. Skilled farmers in meticulous plant care of rice is an important factor to optimum growth and yields of rice plant (Sugiono *et,al* , 2018). Land use in Karawang Regency regulated by local land use regulation called Rencana Tata Ruang Wilayah Kabupaten Karawang where Majalaya village, Sub district Majalaya is set as an agricultural village. There is not land conversion from agricultural, especially rice field area to other purpose like industrial or settlement area. Land area Majalaya village are 3.04 km^2 or 304 hectares, consist of 246 hectares (80%) as rice field and others 58 hectares.

 DOI:

Majalaya village have 3809 population in 2019, and 80% worker in productive age as farmers, especially rice farmers.

World Health Organization (WHO) recommended prevention of Covid-19 pandemic by implementation of lockdown area policy in early 2020. It implemented Large Scale Social Distancing (LSSD) as semi-lockdown in limited area by government Republic of Indonesia, and government West Java Province in Governoor Regulation No. 36/2020 recommended by Helath Ministry Regulation No. HK.01.07/Menkes/289/2020 to implemented LSSD in whole of region West Java Province, included Karawang Regency and sub-district Majalaya. It was disturbed rice farming in sub district Majalaya, especially meticulous rice plant care activities and supply of subsidies chemical fertilizer.

Impact of minimum number combination of on farm mandays and fertilizer dosage application to rice grain yield of rice farming as a research should be done based on all information above.

MATERIAL AND METHOD

The research was conducted in the experimental field rice of Agriculture Faculty, University of Singaperbangsa Karawang, during August to December 2020. The experimental field rice is located at Pasir Jengkol Village, beside of Majalaya Village, Sub district Majalaya between 06,302° S and 107,368° E and falls in a humid climate. There were 27 plots of a (10 x 10) m^2 wet field rice. The soil was an alluvial representing an Entisol (Typic FAO). The soil had sandy loam texture, 5.9 pH, 0.22 dS/m EC, 145 kgs/hectare available N, 72 kgs/ha P and 98 kg / ha exchangeable K. The experiment was arranged in single factor of randomized block design (RDB) with three replications.

Standard of on farm man-days was determined by survey to Majalaya rice farmer and checked to Sub district Majalaya Agriculture Extension Service. Onehundred percent recommemded man-days for rice farming in Majalaya sub district showed in table 1.

Table 1. Standard man-days for rice farming

No	On Farming Activities	Man-days (MD)
1	Soil preparation	40.00
2	Seedling	8.50
3	Transplanting	12.60
4	Fertilizing	4.80
5	weeding	10.00
6	Irrigation	13.30
7	Spraying (pesticide, herb.)	36.00
8	Harvesting	24.00
9	Others	25.00
	Total MD	**174.20**

Standard of dosage fertilizers was determined by survey to Majalaya rice farmer and checked to Sub district Majalaya Agriculture Extension Service, and 100% dosage fertilizer were Urea of 200 kgs/hectare, NPK of 150 kgs/hectare and SP36 of 100 kgs/hectare. The treatments tested were as follows: T1 (number man-days 100%+ dosage fertilizers 100%), T2 (number man-days 100%+ dosage fertilizers 80%), T3 (number man-days 100%+ dosage fertilizers 60%), T4 (number man-days 80%+ dosage fertilizers 100%), T5 (number man-days 80%+ dosage fertilizers 80%), T6 (number man-days 80%+ dosage fertilizers 60%), T7 (number man-days 60%+ dosage fertilizers 100%), T8 (number man-days 60%+ dosage fertilizers 80%), and T9 (number man-days 60%+ dosage fertilizers 60%). There were 3 times replication in each treatment. The plots were minimmum irrigated and 2 cm of standing water was maintained by daily addition of water. Grain yield was determined from each plot and adjusted to the standard of harvest mild dry paddy fresh weight (Sugiono *et al.*, 2017). Statistical data analysis subjected to one-way analysis of variance (ANOVA) using SPSS version 20 software. Duncan's multiple range test (DMRT) was performed to test the significance of difference between the treatments.

RESULT AND DISSCUSION

Rice farming activities i.e; soil preparations, seedling, planting, fertilizing, irrigation, weeding, spraying, and harvesting. In table 1, it showed that numbers man-days/hectare of standard rice farming activities; soil preparations 40.00 man-days/hectare, seedling 8.50 man-days/hectare, transplanting 12.60 man-days/hectare, fertilizing 4.80 man-days/hectare, irrigation 13.30 man-days/hectare, weeding 10.00 man-days/hectare, spraying 36.00 man-days/hectare, harvesting 24.00 man-days/hectare, and other activities 25.00 man-days/hectare. Total 174.20 man-days/hectare and equal Rp 15,678,000.00 / hectare, where unit price of man-days in sub district Majalaya is Rp 90,000.00 / man-days.

There were first and second plow in soil preparations. Good soil preparation has been found to have a remarkable effect on product uniformity. Rice plants can grow and develop more easily in loose and loamy soil, and irrigated. Farmers often plow deeply depend of plow size, so that they can get rid of weeds and other meterial like rocks to the soil can become suitable; soft, well-drained and well aerated, in order to optimum growth of rice (Nurlela *et al.* 2012). The standard number of on farm man-days in soil preparation was using hand tractor and wedding using hoe and other tools followed straw and stubble chopping following which the soil was trampled and then straw and stubble were work into the mud. Three wedding were done.

The rice seeds used Ciherang variety seeds. It is a high grain yield and short-term yielding varieties. The Ciherang rice is popular rice and more liked by

domestic consummers. Potential rice grain yields as mild dry paddy production Ciherang variety is 5-8 tons per hectare. Two rice varieties are planted in Majalaya village and plant characteristics vary widely, since rice is grown under a wide range of field conditions and cultivation methods. The plant characteristics are often critical factors limiting the technical improvement of farming operations or the labor efficiency of rice production as well as the yield potential and quality of rice. In order for the farmers to cope with a wide range of paddy growing conditions, two distinct types of rice varieties are recommended by the agriculture extension service of department agriculture Karawang. There are high yielding short term varieties implemented in Majalaya village, it calls Ciherang variety and Inpari 32 variety. Seedling is done in limited field rice area where it is wet and muddy but not watered deeply and raise 10-15 cm height. Drainage canal constructed for proper water removal. It added manure and small amount of chemical fertilizer to increases seed vigor and allows easier uprooting for transplanting seedling when 20 day old. Seedling of rice needs 7.5-8.5 man-days.

Transplanting of seedlings are transplanted at 25 cm intervals. The tops of the seedlings are cut off to reduce water loss and give more rigidity to the plants after transplanting. Transplanting is done by dibbling with a wooden bar. The types and shapes of dibbling tools vary considerably depending upon field conditions including soil moisture content, soil hardness and extent of leveling. Transplanting are done by two farmer and work together. The first farmer walks ahead with his dibbling bar, and the second farmer follows him to place seedlings into the holes which he made. The average man-days needed for transplanting is 12-13 man-days per hectare.

Weeding aquatic weed growth is a major problem to a wet paddy farmer. Climatic conditions are favorable for continuous weed growth throughout the year, since Karawang receives occasional rainfalls even during the dry season. Yet due to a lack of irrigation, the amount of water in the field is insufficient to control the weeds. These conditions make weeding more difficult and labor-consuming. Weeding is usually done by hand once or twice between transplanting and harvesting. The common tool is a small round-ended iron blade set at right angles to a shaft which is imbedded in a wooden handle called Sabit. Usually, farmers squat between the stubbles of growing rice and cut away the thick weeds. Weeding is the most tedious task of all the labor stages in the farming cycle. The efficiency of the work is often lowered by hot, and humid weather conditions during the rainy season. About 7-10 man-days are required to weed one hectare of standard paddy field. Since many farmers consider that weeding is neither a rewarding task nor an urgent need, they often put off its completion and allow themselves to accept haphazard work. This is not to say that the importance of weeding is overlooked. Nonetheless the degree of weeding varies considerably from farm to farm depending upon the diligence of farmers. The introduction of herbicide has been unconditionally welcomed by the farmers.

Scheme of fertilization involves 3 major fertilizers applications, the first at the same time with planting and other 2 times at 28 and 56 days after planting (Salma *et al*. 2019). Under this scheme, it applied interchangeably Urea of 200 kgs/hectare, NPK of 150 kgs/hectare, and SP36 of 100 kgs/hectare. There is not supply other inorganic fertilizer contains Kalium, except NPK in Sub district Majalaya. Farmer used NPK for fulfil of Kalium needed by rice plant. It caused reduce amount of Urea and SP 36 fertilizer Pests and diseases checked by observing carefully the shape and color of leaves and rice straw (Mulyono *et al*. 2016). Pesticides were used Sidamethrin 50 EC of 3-4 ml/l per hectare or Virtako of 150 ml/ hectare to prevent kind of planthoopers as destroyer rice straw and leave like Nilaparvata Lugens, Scirpophaga Incertulas, and Sogatella Furcivera. Herbcide used Goldstar. Observing and spraying pesticide need 36 man-days per hectare Preharvesting the rice plants was done by stopping all irrigation, and let the rice another 15 days before harvesting (Nurmala *et al*. 2012). It would be the color of paddy becomes yellow. One hundred and fifteen days after planting, the rice was ready to be harvested by conventional harvesting tool. Harvesting requires 24 man-days per hectare and is also a labor-consuming operation. The harvesting operation must particularly be timely in order to get high quality grain and minimize field losses. A delay in harvesting results in over-ripening and over-drying, and induces cracking damage.

Univariate Analysis of variance (Anova) showed that there was one treatment significant difference of rice grain yield per hectar to other treatments. Duncan's Mean Range Test (DMRT) showed that treatment of T2 and T4, not significant to T1 as controle treatment wich it combined standard man-days of rice on farm and dosage of fertilizer application, and significant difference to other treatment. (Table 2).

Table 2. Mean rice grain yield (tons/hectare)

No.	Treatment	Rice grain yield	DMR Test
1	T1	5.85	a
2	T2	5.57	ab
3	T3	4.45	c
4	T4	5.80	a
5	T5	5.65	ab
6	T6	4.80	c
7	T7	5.48	b
8	T8	5.05	b
9	T9	4.02	c

Data analysised by SPSS seri 20.

Based on data in Table 2, treatment T4 of combined 80% on farm man-days standard and 80% dosage fertilizer application causes decrease rice grain yield but not significant compared by using controle

treatment T1 as standard combined on farm man-days in rice farming and fertilizer application. Treatment T9 of combined 60% standard on farm man-days and 60% standard dosage fertilizer application would be decrease about 31.2 % rice grain yield below controle treatment T1. Effect on rice grain yield combined treatments of different rates number on farm man-days and chemical fertilizers dosages on rice grain yield are shown in Table 3. The highest mean grain yield was obtained from the controle treatment T1 (5.85 tons/hetare) followed by T4 (5.80 tons/hectare), T5 (5.65 tons/hectare), and T2 (5.57 tons/hectare) are not significant but not involve 60% standard dosage fertilizer. I were also significantly higher than T3 (4.8 tons/hectare), T6 (4.6 tons/ hectare), and T9 (4.08 tons/hectare). Treatment T3, T6, and T9 are lowest rice grain yield involve 60% standard fertilizers application indicated that fertilizing rice on farm must be minimum use 80% standard fertilizer application.
When LSSD implemented in pandemic covid19 period or it continued to New Normal Adaptation (NNA) period which a regulation implemented peoples included farmer must be stay at home for a long time. It would be decreases using number of on farm man-days for rice farming and supply of chemical fertilizers in sub district Majalaya. Minimum number combined on farm man-days and fertilizer application is 80% standard of combined on farm man-days and fertilizer application.

CONCLUSSION AND SUGGESTION

There were conclusions of this research:

1. Using combined of 80 % standard on farm rice farming man-days and fertilizers application is minimum number to rice grain yield. It is not significant compare to using combined of standard numbers on farm rice farming man-days and fertilizer application.
2. Using combined of 60 % standard on farm rice farming man-days and fertilizers application will be decreases 31.21% rice grain yield. It is different significantly compare to using combined of standard numbers on farm rice farming man-days and fertilizer application.

Suggestion for rice farmer in Sub district Majalaya, Karawang Regency, that rice farming feasibles on New Normal Adaptation Period by using combined of minimum number on farm rice farming man-days and fertilizer application must be more than 80% standard number on farm rice farming man-days and fertilizer application.

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