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Introduction to Application of Rubber Tapping Technology and Its Impact on Production in Mekar Tani Group, Sari Laba Jahe Village, Deli Serdang Regency

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Abstract: *The increase of rubber production can be done by introducing tapping technology for rubber farmers, when rubber prices are low. The facts showed that smallholder rubber production is still low, in the range of 600-800 kg of dry rubber / ha / year. Tapping practiced by rubber farmers is generally not based on tapping technology, which is integrated in the aspects of plants, tapping planning and management, the use of stimulants, and a number of other technical aspects. To increase smallholder rubber production, rubber tapping technology was introduced to Mekar Tani Groups in Sari Laba Jahe Village, Sibiru Biru District, Deli Serdang Regency (North Sumatra). The results of the introduction in the form of stimulant application showed that a month after applying the stimulant, the increase in production averaged 60.65%. If production without applying the stimulant was 0.18 kg / tree, then after applying the stimulant 0.28 kg / tree was obtain. The results of this study within a month were still continuing to observe other aspects such as the quality of rubber produced due to the application of stimulants, as well as farmers' income.*
Keywords: *production; tapping technology; rubber farmers.*

I. Introduction

In the management of rubber plantations, the aspect of tapping by slicing the skin so that the sap dripping as production is a major component. In other words, tapping done for more than 20 years on plants requires an approach based on agronomic aspects, engineering aspects, and planning aspects and crop management. These things become a priority so that in addition to obtain the sustainable production, high production (in the form of g / tapping / plant) is also produced. In short, by planting superior clones that do not accompany the aforementioned aspects, rubber production remains low due to the absence of integrated tapping technology (tapping system, tapping frequency, the use of appropriate tools, the use of stimulants, etc.).

The results of the application of tapping technology which includes the application of stimulants and tapping combined with tapping 1 / 4S upward in the upper tapping area with 1 / 2S downward in the lower tapping field in a large number of plantation company's results in a significant increase in production. Ideally, tapping with this system is done with a tapping frequency of 1 x 3 days. However, for rubber farmers, the frequency cannot be changed, bearing in mind that there are other activities that have been periodically carried out. This also relates to the arrival of buyers who have also been periodic.

In addition to applying the right concentration of stimulants (Siagian and Siregar, 2011), increased production must also be based on the regularity of tapped fields. Siregar and Suhendry (2009) concluded that the tapping in the planned tapping field would be advantageous in the long run because the lower tapping field could be tapped for 12 years (B0-1 and B0-2), then the recovered skin on both tapping fields could be combined with the tapping of the top tapping fields (H0-1 and H0-2) for 12-15 years, which then ends in free tapping for 2-4 years. Thus, tapping can be done at least 25 years (Fu et.al, 2007).

The facts show that rubber farmers have not been equipped with this understanding and skills, even ignoring the tapping system as an integrated system. In most smallholder rubber plantations (hevea small holders), these bases are often neglected, so that community rubber production is only in the range of 600-8000 kg of dry rubber / ha / year, still below production

standards in the range of 1200 - 1500 kg of dry rubber / ha /year. This is the background of the importance of the introduction of integrated rubber tapping technology, as an important part of efforts to increase production. This introduction is considered a priority, given the price of rubber that has not increased, which is in the range of Rp.6.500 - Rp.8.5000 / kg wet. In short, without any effort to increase production, rubber farmers do not get adequate income from managed rubber plantations (Barkley and Parkley, 2013).

On the basis of the need for knowledge and application of rubber tapping as an integrated technological system, the introduction of rubber tapping technology was carried out in one farmer group, which manages its rubber plants with multiple cropping patterns. This paper reports on the results obtained from the introduction of rubber tapping technology in the form of applying a stimulant, as an effort to increase the production of rubber farmers.

II. Materials and Methods

The research in the form of this introduction of technology was carried out at Mekar Tani Groups, located in Sari Laba Jahe Villages, Sibiru Biru District, Deli Serdang Regency (North Sumatra). A total of 20 rubber farmers were included in this activity, which manages rubber plants in multiple cropping plantations that is rubber is managed on land that was also planted with a number of annual crops such as durian, duku, and sugar palm. The tapping technology introduced was in the field of tapping B0-1, as presented in Table 1.

Table 1. Introduction of Tapping Technology

No	Component	Pre-introduction tapping (Pra I)	Tapping introduced (Pasca I)
1	Tapping direction	Irregular	Start top left to bottom right
2	Tapping field	Unplanned	Starting from B0-1
3	Stimulants	Never	2%, smeared after 4-5 times tapping, after first pulling the scrap (sap that covers the tapping groove)
4	Tapping combination	Never	B0-1 combined tapping with 1 / 4S upward using a special knife. Combination is done 2- 4 times a month
5	Standard tapping slices	Never considered	Only 1.25 mm thick each time tapping
6	Depth of tapping	Never considered	Prevent wounded cambium

Figure 1. *Plant conditions due to tapping without technology and an ideal tapping system*

Combine tapping with 1/4 H0-1 using a special knife

In tapping: 1.5 mm (prevent cambium injury)

Tapping direction: from top left to bottom right

Apply stimulants after scrap is pulled

Start tapping at B0-1 (lower, left tapping field

Skin slices of each tapping: 1, 25 mm

Figure 2. *Introduced tapping technology*

Taping knife for the lower tapping field (1/2S)

Special tapping knife for the top tapping field

Figure 3. *Specific tapping knives for top tapping fields which was introduced*

In its application, training was first carried out in the plantation of the member of farmer group for 4 times, accompanied by a visit to Sungei Putih - Rubber Research Center. To find out the impact on production from the introduction of this technology, 16 farmers were chosen to separate the plants that were still being tapped before the introduction of technology (Pra I) and post technology introduction. Production is recorded every week, while the frequency of wiretapping continues to be done 1 x 2 days. All these activities were carried out starting in June 2019 and are continuing to discuss barriers and possible development of more specific training (such as post-harvest handling, formation of cooperatives, etc.).

Figure 4. *Tapping technology training before applied to their respective gardens*

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III. Result and Discussion

In other words, the application of stimulants as a component of tapping technology can increase production. In farmer number 14, the increase in production <20% is due to the tapping having just begun, that is the tree that was first opened for tapping.

Table 2. Impact of Introduction of Tapping Technology by Applying Stimulants to Production

No	Farmer's name	Production of 10 trees (kg)		The amount of stimulant application (times)*)	Per-tree production (kg)		Increase (%)	Information
		Pra I	Pasca I		Pra I	Pasca I		
1	Hera br Sinuraya	2,9	3,4	1	0,29	0,34	85,29	
		2,8	3,2		0,28	0,32	87,50	
2	Wasta br Sembiring	2,5	3,4	2	0,25	0,34	73,53	
		2,3	3,2		0,23	0,32	71,88	
3	Irwan PA	2	2,7	1	0,2	0,27	74,07	
4	Adil Tarigan	1,3	2,4	1	0,13	0,24	54,17	
5	Titom Tarigan	1,8	2,8	2	0,18	0,28	64,29	
		1,3	2,8		0,13	0,28	46,43	
		1,4	2,2		0,14	0,22	63,64	
6	Juni Tarigan	1	1,8	2	0,1	0,18	55,56	Rain, during the second basting
		0,9	2		0,09	0,2	45,00	
		1	1,8		0,1	0,18	55,56	
7	Antoni Tarigan	1,6	2,6	1	0,16	0,26	61,54	
8	Iwan Tarigan	3	5	2	0,3	0,5	60,00	
		2,5	4		0,25	0,4	62,50	
9	Nunus Sinuraya	2,8	4	1	0,28	0,4	70,00	
		2,8	3,6		0,28	0,36	77,78	
10	Jumali	1,7	2,5	1	0,17	0,25	68,00	Retired plantation company
		1,6	2,8		0,16	0,28	57,14	
		1,6	3		0,16	0,3	53,33	
11	Kaperas br Tarigan	2	3	1	0,2	0,3	66,67	
		2	3		0,2	0,3	66,67	
		2	3		0,2	0,3	66,67	
12	Benata Tarigan	2,2	3	2	0,22	0,3	73,33	
		2	2,8		0,2	0,28	71,43	
13	Elieser	1,5	2,6	2	0,15	0,26	57,69	
		1,2	2,2		0,12	0,22	54,55	
14	Adi Putra Barus	0,23	1,2	1	0,023	0,12	19,17	
		0,21	1,5		0,021	0,15	14,00	Just tap open
		1,2	2,5		0,12	0,25	48,00	
15	Verandes S	0,26	1,4	1	0,026	0,14	18,57	
		1	1,5		0,1	0,15	66,67	
16	Pendi Peranginangin	2,7	3,6	1	0,27	0,36	75,00	
		2,6	3,4		0,26	0,34	76,47	
	Average	1,76	1,40	2,76	0,18	0,28	60,65	

*) In the period of 2 July 2019 to 2 August 2019. The amount of stimulant application depends on other farmers' activities, so that the frequency and time of its application cannot be determined simultaneously. But the principle of basting is done every 4-5 times of tapping. Tapping in 1 week is done 3 times, or 12 times a month. Ideally, the application of stimulants is done a maximum of 4 times a month. The data

above is the result of a trial in which production data is recorded post stimulant in 10 trees which are smeared. Pre I = before application of stimulants Post I = after application of stimulants.

For newly tapped trees, the application of stimulants is not recommended. Likewise, the application of stimulant if within < 2 hours later it rains, it will affect the damage of latex that flows so that it cannot freeze, as experienced by farmers number 6. Whereas farmers number 10, data (not presented) shows the number of trees tapped an average of 300 trees / tapping day. This shows that the factor of the number of trees being tapped every day is also a component of tapping technology. In other words, high skills make an increase in the number of trees tapped per tapping day (Yujieet.al, 2012). Other factors that must also be considered are the type of planting material (seeds or clonal), spacing, cleanliness of spaces, quality and type of tapping knives, tapping frequency, besides the stimulant component (Siregar, et.al, 2008).

Table 1 proves that one component of tapping technology, namely the application of stimulants, has been able to increase production by an average of 60.65%, or increase from 0.18 kg / tree (Pra I) to 0.28 kg / tree (Pasca I).

The results obtained are one component that can significantly increase the income of rubber farmers. When rubber prices continue to be low, increasing production is one of the efforts to increase the income (Siregar and Siagian, 2016).

This research is still being conducted to determine the impact on the quality of the rubber produced, including levels of impurities and levels of dry rubber from the application of stimulants. Overall tapping technology is projected to increase production and quality of smallholder rubber.

IV. Conclusion

From the observations of a month after the introduction of tapping technology in the form of stimulants application for 1-2 times a month on rubber farmer of Mekar Tani Group concluded that an increase in production an average of 60.65%. The average production before application is 0.18 kg / tree, increased to 0.28 kg / tree. The number of tapped trees / tapping days is an influential component, as a skill implication, besides the age of the tree. This activity continues to observe other factors such as the income of rubber farmers and the quality of rubber produced due to the application of stimulants.

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