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The Influence of Aquaculture to Leaf Productivity Aloe Vera L. In Pontianak City.

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ABSTRACT
The objectives of the research were to find out (a) the effect of Aloe Vera L. culture, consisting of fertilizing (X1), plant spacing (X2), weeding (X3), seed selection (X4), Planting (X5), leaf collection (X6), and crop pest control (X7), on the productivity of Aloe Vera L. in Pontianak City West Kalimantan, and (b) the direct or multilevel effects of Aloe Vera L. culture on the productivity of the Aloe Vera L. leaves cultivated by farmers in Pontianak City West Kalimantan. The research was conducted at the farmers' Aloe Vera L. gardens in Pontianak Utara Subdistrict, Pontianak City, West Kalimantan Province. The proposal preparation, data collecting and processing were started from June to December 2012. The result indicated that the plant population, the provision of Aloe Vera L. ash and manure, the frequency of pruning and harvesting ($P < 0.01$), and the provision of Urea and KCl fertilizers ($P < 0.05$) had significant effects on the productivity of Aloe Vera L. plants, except for the height of plots, the plant lines per plot, the number of seed's leaves, the age of seed, the provision of lime, SP-36 fertilizer, and the control of crop pests. The provision of Aloe Vera L ash, Urea, KCl, and manure was 932.25 Kg ha-1, 133.00 Kg ha-1, 209.38 Kg ha-1, and 1.134 Kg ha-1, respectively. The biggest direct effect of the culture on the productivity of Aloe Vera L. was the frequency of harvesting that contributed 38.76 %, followed by the frequency of leaf pruning (13.26 %), the provision of Aloe Vera L. ash (13.19 %), the provision of manure (5.69 %), and the provision of KCl (2.02 %). The indirect effect of Urea, KCl, and manure on the productivity would have greater effects compared to their direct effects.

INTRODUCTION

Aloe vera (Aloe vera L.) is a succulent plant that has long been known by the World community as one of important medicinal plants and ornamental plants. Aloe vera plants, although not native to Indonesia, can grow well in our country, even in West Kalimantan Province, especially in Pontianak, this plant adapts much better than in other places. This is recognized by experts aloe vera abroad which is therefore also regret when the komporatif keunggulanya owned by this plant is not utilized by Indonesia. The importance of global market, at least regional, to aloe vera Indonesia needs to be

followed up with various programs that support the development of this commodity from farmers start in farmers land, processing the results into various agroindrusti products, and marketing the products both domestically and globally. This paper will present information based on the results of field studies covering aspects of cultivation that affect the produtivitas leaf aloe and social conditions associated with the development of aloe vera. Land that has been developed for aloe vera farming in Pontianak Utara Sub-district until 2004 reached 161 hectares. But the phenomenon seen in the field is the shrinking of the area of planting aloe vera, but if seen from the productivity from year to year has increased. This illustrates the existence of agronomic action activities that need to be studied how far its influence to increase productivity of Aloe vera leaves.

METHOD

Place and time of research

This research was carried out in farmers' gardens of Pontianak Sub-district, Pontianak City, West Kalimantan Province. From the preparation of proposals, data collection and data processing starting from June to December 2012.

Types and Data Sources

The data collected includes primary data and secondary data. Primary data is data collected by the researchers directly by conducting direct interviews in the field with aloe vera farmers as respondents using questionnaire (questionnaire).

Method of collecting data

Sampling method used in this research is census method that is taken all farmers in North Pontianak as much as 40 farmers or head of family (KK).

RESULTS AND DISCUSSIONS

The Effect of Cultivation Against the Productivity of Cultivation Tongue Plant

The result of multiple regression analysis of cultivation behavior on aloe vera productivity can be seen that the effect of cultivation behavior consisting of high bed, plant path per bedeng, number of seedlings, seed age, plant population, lime, ash, urea fertilizer, SP-36, KCL, Fertilizer, Coop, leaf pruning frequency, and harvest frequency together showed a very significant effect ($P < 0.01$) on aloe vera plant productivity with determination coefficient ($R2$) = 96.1%. This shows that the multiple regression model is very good to be used to explain the contribution of diversity of free variables (X = acts of cultivation) to Y diversity (productivity). From the value of the coefficient of determination shows that the model can explain the contribution of cultivation to productivity of 96.1% and that is not explained by the model of 3.9%.

The result of partial regression analysis showed that crop population, giving of Ash, manure, pruning frequency and frequency of harvest respectively very significant ($P < 0.01$), and Urea fertilizer and KCl fertilizer respectively significantly ($P < 0, 05$) to the productivity of Aloe vera plant. While the height of the bed, plant path per bedeng, the number of seed leaves, age of seed, lime, SP-36 fertilizer, pest control each no real effect.

Table 1. Results of partial regression analysis of cultivation behavior on productivity plant Aloe Vera

Predictor	Coefficient regression	Standard Error	t-Count	Probability
Constant	-10.568	4.577	-2.31	0.030 *
Tinggi Bedeng (X1)	-0.02943	0.04512	-0.65	0.520 ns
Jalur per petak (X2)	-0.2498	0.4072	-0.61	0.545 ns
Jumlah Daun bibit (X3)	-0.0718	0.6153	-0.12	0.908 ns
Umur.Bibit (X4)	-0.2366	0.3484	-0.68	0.503 ns
Populasi (X5)	0.00040721	0.000086	4.76	0.000 **
Kapur (X6)	0.1867	0.5795	0.32	0.750 ns
Abu daun lidah buaya(X7)	0.0022370	0.0005956	3.76	0.001 **
Urea (X7)	0.008127	0.003586	2.27	0.032 *
SP-36 (X8)	0.011697	0.006244	1.87	0.073 ns
KCl (X9)	0.003620	0.001692	2.14	0.042 *
Pupuk.Kandang (X10)	0.0008788	0.0002818	3.12	0.005 **
Frekuensi.pangkas daun (X11)	1.6625	0.4231	3.93	0.001**
Pengendalian OPT (X12)	0.2540	0.5034	0.50	0.618 ns
Frekuensi Panen (X13)	6.280	1.243	5.05	0.000 **

Information :
ns =, no significant effect ($P > \alpha = 0,05$)
* =, have real effect ($P < \alpha = 0,05 > 0,01$)
** = very real effect ($P < \alpha = 0,01$,)

Relationship Against Cultivation Against Productivity

The result of correlation coefficient analysis among the variables of cultivation behavior can be seen in Appendix 8. From Appendix 8 it can be seen that the application of Ash, Urea fertilizer, KCl, manure, leaf weight shows a very positive positive linear relationship, and number of seedling leaves, crop frequency and frequency each harvest showed a positive linear relationship to the productivity of aloe vera plant, while the height of the bed, plant line per bedeng, plant population, lime, SP-36 fertilizer and pest and disease control respectively no real correlation. The correlations between Abu, Urea, KCl and manure each show a real relationship to leaf weight per piece.

The correlation analysis shows the closeness of the relationship between variables, but has not yet described the causal variables. Therefore it is continued with cross coefficient analysis. In this analysis the correlation coefficient is broken down into two components, namely the direct influence of the cause variables and their indirect effects channeled through other lower-order variables (Wright, 1921, 1934, Tukey, 1954, Dewey and Lu, 1959 , 1971). The results of cross coefficient analysis are presented in Figure 1.

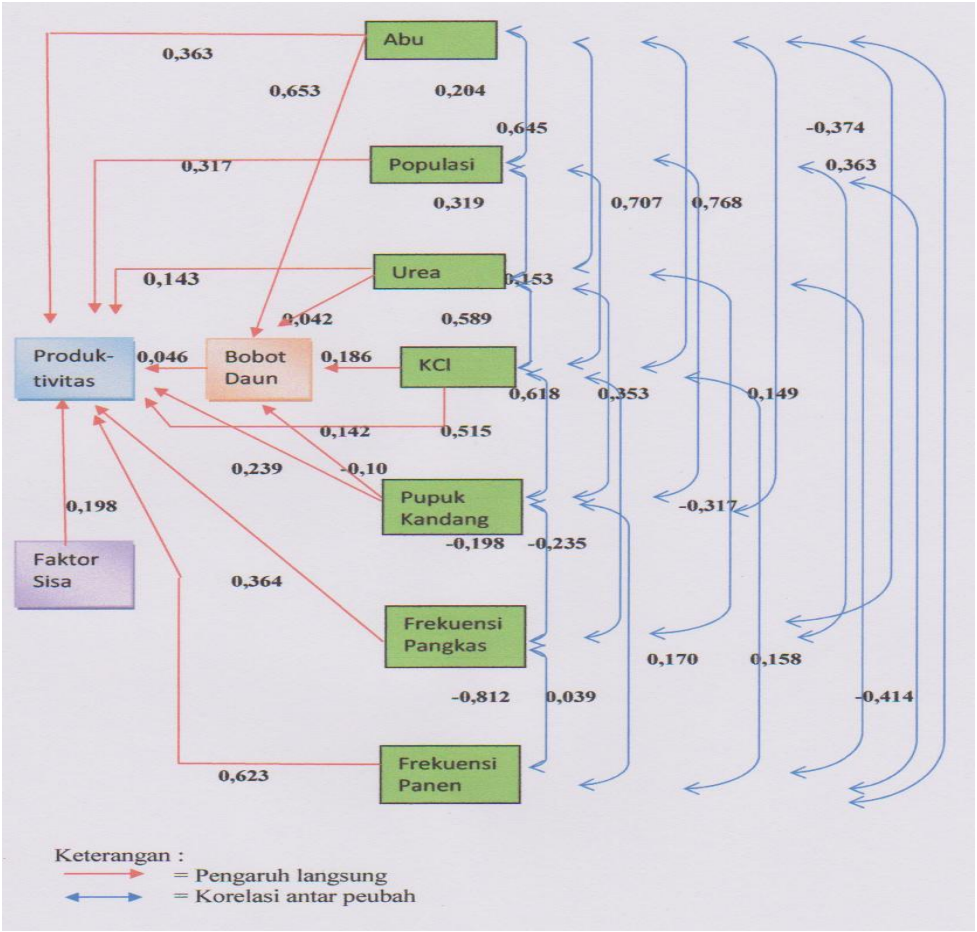

Figure 1. Cross-coefficient analysis of cultivation behavior on aloe vera plant productivity

From Table 1 and Figure 1 it can be seen that the biggest direct effect of cultivation on aloe vera productivity is harvest frequency with donation of 38,76%, followed by leaf pruning frequency (13,26%), giving of Ash (13,19%) , manure (5.69%), Urea (2.05%) and KCl (2.02%).

The indirect effect of Ash on productivity distributed through Urea fertilizer is 0.645 x 0.143 = 0.092, through KCl is 0.707 x 0.142 = 0.100, through manure is 0.768 x 0.239 = 0.184. Thus, the direct effect of Abu's on productivity is still greater than its indirect influence channeled through Urea, KCl and manure. The indirect effect of Urea fertilizer channeled through the Ash is 0.645 x 0.363 = 0.234, channeled through KCl is 0.589 x 0.142 = 0.084, while that is channeled through manure is 0.618 x 0.239 = 0.148. Based on the calculation of cross coefficient analysis, the effect of Urea fertilizer is not greater if it is channeled through Ash and Pupuk Kandang.

The indirect effect of KCl fertilizer channeled through Ash is 0.707 x 0.363 = 0.257, via Urea is 0.589 x 0.143 = 0.084, through manure is 0.515 x 0.239 = 0.123. It can be concluded that KCl's indirect effect on productivity will be greater in role if channeled through Abu.
The indirect effect of manure channeled through the Ash is 0.768 x 0.363 = 0.279, via Urea is 0.618 x 0.143 = 0.088, via KCl is 0.515 x 0.142 = 0.073. It can be concluded that the indirect effect of manure on productivity will be greater role if channeled through Abu.

Based on correlation analysis showed a very real relationship between Abu, Urea, KCl and manure respectively to the weight of leaf per leaf. Based on the cross coefficient analysis, it shows that the direct effect of the donation is greater (42.67%) than the Urea fertilizer (0.17%), KCl (2.81%) and manure (1.00%).

Relationship Against Cultivation Against Productivity

Giving Ash, Urea fertilizer, KCl, manure, leaf weight showed and number of leaf seeds, frequency of crop and frequency of harvest respectively showing positive linear relationship to productivity of aloe vera plant, while height of beds, plant line per bedeng, plant population, lime , SP-36 fertilizers and pest and disease control are not significantly correlated. This shows that the cultivation action has a close relationship to the productivity of aloe vera plant. Based on the analysis of coefficients across the direct effect of cultivation, the greatest effect on the productivity is harvest frequency with donation of 38.76%, followed by leaf trimming frequency (13.26%), Abu (13.19%), manure (5 , 69%), Urea (2.05%) and KCl (2.02%). The frequency of this harvest is the greatest effect on crop productivity. The more harvest is done then the productivity of the plant will increase as well. Nevertheless, of course for the growth of the plant continues to be encouraged then the elements of support is very necessary to consider in providing nutrients needed plants.

Giving Ash, Urea, KCl and manure each have a direct effect on productivity. Of the four elements, the greatest direct influence is Abu. The indirect effects of Urea fertilizer, KCl and manure on productivity channeled through the Ash will be greater than direct influence. Thus, the role of Urea fertilizer, KCl and manure will be seen if it is combined with the Ash. From observations in the field, the farmers before planting, planting hole first given ash, Urea fertilizer, KCl simultaneously. With the combination of Ash with Urea fertilizer, KCl, and manure allegedly the direct influence of Ash and the indirect effects of Urea, KCl, and Manure which is channeled through the Ash influence will be greater productivity. Similarly, the Ash used is derived from dried aloe vera leaf and some weeds in the planting area, then in the combustion mixed with lime to produce elements that are suspected to substitute K, Ca, silicate and carbon. This indicates that Ash is potentially exploited as an ameliorant in peat soil for aloe vera plants.

The direct influence of leaf weight per piece on productivity is very small. This is because the weight of the harvested leaves weighs relatively the same from the range 0.7 kg - 1.6 kg with an average per leaf blade of 1.15 kg per piece. This shows that the productivity of the plant is still determined by other factors such as the many leaves that are harvested and the frequency of harvesting as well as the local climate.

CONCLUSION AND SUGGESTION

Conclusion

1. The crop population, the application of aloe vera, manure, the frequency of pruning and the frequency of harvest each have a very significant effect ($P < 0.01$), and the application of Urea fertilizer and KCl fertilizer have a significant effect ($P < 0.05$) to the productivity of Aloe vera plants, except for the height of the bed, plant line per bedeng, number of seedlings, seedlings age, lime application, SP-36 fertilizer, and control of plant disturbing organisms

2. The largest direct effect of cultivation on aloe vera productivity is harvest frequency with donation of 38,76%, followed by leaf pruning frequency (13,26%), giving of Ash (13,19%), manure (5, 69%), Urea (2.05%) and KCl (2.02%).

3. The indirect effect of Urea fertilizer, KCl and manure on productivity channeled through Ash will be greater than direct influence.

Suggestion

1. Direct effects of plant populations, Ash, Urea, KCl and manure show a significant role in the productivity of Aloe vera. To increase maximum productivity it is suggested that this research need to be developed again by continuing research on plant population, Ash, Urea, KCl and manure to know how many population of the right plants and how much fertilizer needed for the productivity of aloe vera plants achieve maximum results

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REFERENCES

AVC, 2012, *Data produksi lidah buaya kota Pontianak*, Potianak

Dewey,D. R. And Lu, K. H. 1959. A correlation and path coefficient analysis of Components of crested wheatgrass seed production. Agron. J.

Dinas Pertanian Tanaman Pangan Provinsi Daerah Tingkat I Kalimantan Barat, 2010. *Laporan Tahunan Dinas 2010/2011*. Pontianak.

Dinas Urusan Pangan Kota Pontianak, 2012. *Data Produktivitas Tanaman Lidah Buaya*. Pontianak

Furnawanthi, 1. 2002. *Khasiat dan Manfaat Lidah Buaya*. Agromedia Pustaka. Jakarta.

Gujarati, D. 1999. *Ekonometrika*. Penerbit Erlangga. Jakarta.

Hardjowigeno, S. 1987. *Ilmu Tanah*. PT. Mediyatama Sarama Persala. Bogor.

Hunter, BB dan H.L. Barnet 1998. *ILLustrated Genera of imperfect Fungsi*, 4^{tn} ed. APS Press. The America Phytopahological Society.

Lingga, P. 2001. *Petunjuk Penggunaan Pupuk*. Penebar Swadaya. Jakarta.

Munson, R.D. 1982. *Potassium, calcium, and magnesium in Tropics and Subtropics*. Tech.Bull. IFDC-T-23. International Fertlizer Development Centre, Alabama, USA

Prawiranata. 1981. *Dasar-Dasar Fisiologi Tumbuhan Jilid I dan II*. Departemen Botani Fakultas Pertanian IPB, Bogor

Reintjes, C, Harvekort dan A. W. Bayer. 1999. *Pertanian Masa Depan, Pengantar untuk Pertanian Berkelanjutan Dengan Input Luar Rendah*. Terjemahan oleh Y. Sukoco dan S.S Kanisius. Yogyakarta.

Sarief, S. 1989. *Kesuburan dan Pemupukan Tanah Pertanian*. Penerbit Pustaka Buana. Bandung

Sitompul, S.M. dan B. Guritno, 1995. *Analisis Pertumbuhan Tanaman*. Gadjah Mada University Press. Yogyakarta.

Sri Setyati Harjadi, 1988. Pengantar Agronomi. Gramedia. Jakarta.

Stevenson, F. J. 1982. *Humus Chemistry, Genesis, Composition, Reactions*. John Wiley and Sons, Inc., New York. 496 p.

Sudarto, Y. 1998. *Lidah Buaya*. Kanisius. Yogyakarta

Sudjana, 1989. *Desain dan Analisis Eksperimen*. Tarsito. Bandung.

Sutedjo, 1995. *Pupuk dan Cara Pemupukan*. Rineka Cipta. Jakarta.

Sutejo, M.M. dan A.G. Kartasaputra, 1990. *Pupuk dan cara Pemupukan*. Rineka Cipta. Jakarta.

Tan, K. H. 1982. *Principles of Soil Chemistry. Terjemahan*. Goenadi, D. H. dan B. Radjagukguk. 1995. Dasar-dasar Kimia Tanah. Gajah Mada University Press. Yogyakarta. 295 hal.

Tarigan, D.D. 2001. *Lidah Buaya Si Tanaman Ajaib*. Warta Penelitian dan Pengembangan Pertanian 23 (4).

Wright, S. 1921. *Correlation and caustion*. J. Agron. Res. 20 :557-585.

Zul. 2002. *Lidah Buaya Sebagai Obat dan Minuman Penyegar*. Pikiran Rakyat Cyber Media.