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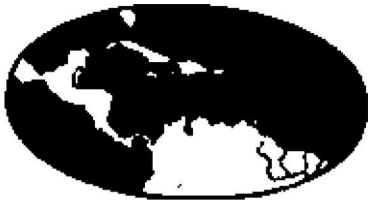

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AWARENESS AND ADOPTION OF CHEMICAL WEED CONTROL IN PEANUT FARMING IN SURINAME

H.J. Veltkamp
Agricultural Experiment Station, Paramaribo

SUMMARY

Awareness and adoption of chemical weed control in peanut farming and the use of communication channels among peanut cultivating farmers was studied. One and a half years after its introduction 17% of the farmers had adapted this innovation. A large group was still not aware of the innovation. Lack of knowledge was the major constraint to its adoption. A description is given of the process by which information on improved farm practices goes from the source, in this case the Agricultural Experiment Station, to the farmers. Constraints which may have hindered a more effective flow of information to the farmer are discussed.

INTRODUCTION

In 1977 in Suriname 282 ha were cultivated with peanuts. The production was 338 tons of unshelled air-dried nuts. Moreover 406 tons of shelled peanuts were imported. Area, and, in consequence production, has dropped very much in the last ten years. In 1965 the area was still 648 ha. Because of the very labour intensive character of peanut cultivation when all activities are done by hand the cultivated area has decreased enormously. The introduction of labour saving techniques may increase the cultivation of peanuts.

Research of the possibilities of chemical weed control was considered one possible way to reach this objective. Mechanical weed control with a Kubota PC tractor fitted with a spiral plough gave disappointing results (de Wit, 1974). Of the herbicides tested for several seasons, Lasso (alachlor, 43% a.i.) proved to be the best one (Dumas & Ausan, 1978).

Based on those results its utilization by farmers was recommended in April 1976 (Veltkamp, 1976). One and a half years after its introduction a study was made of the rate of awareness and adoption and the use of communication channels on this subject by peanut cultivating farmers. The results of this study are presented in this paper.

THE DIFFUSION OF INFORMATION ON IMPROVED METHODS OF CULTIVATION TO THE FARMER

The Agricultural Experiment Station is the main source of recommendations for cultivation of crops in Suriname. Dissemination of research data from the Agricultural Experiment Station to the farmer is a task of the Agricultural Extension Service. This service also belongs to the Ministry of Agriculture and has offices in all rural districts. The headquarter is located in Paramaribo, the capital of Suriname.

Already in 1967 meetings were held to discuss the possibilities to come to a better communication between the Agricultural Extension Service and the Agricultural Experiment Station in order to accelerate the dissemination of research results to the farmer. Interviews with extension

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agents held in 1970 by Kalshoven showed "that personel of the lower echelons, who visited the farmers most regularly received little information from their own agency, either by written or by oral communication" (Kalshoven, 1977).

Since 1974 the dissemination of research results to extension agents is carried out by division of the Agricultural Experiment Station called Contacts-with-the-Extension Service. For the dissemination of information to extension agents the division Contacts-with-the-Extension Service uses different communication channels:

* The issue of pamphlets for extension agents.
* Method and result demonstration meetings and field days at a demonstration garden of approx. 3.7 ha.
* Group discussions at meetings of extension agents in some districts.
* Farm visits together with extension agents.
* Office calls and visits.

Of these communication channels the issue of pamphlets and the meetings at the demonstration garden are the most important ones. Furthermore information is disseminated to farmers via participation in the weekly radioprogramme of the Ministry of Agriculture in collaboration with the Agricultural Publicity Service. Finally in 1976 the issue of leaflets on different agricultural topics for farmers was initiated again.

The most important organization for contacts on agricultural affairs with farmers is the Agricultural Extension Service especially via personal visits and – to a much lesser extent – farm demonstrations.

The organizational structure of the Agricultural Extension Service has been described by Kalshoven (1977). Leaflets for farmers are mainly distributed via the Agricultural Extension Service. Extension agents also participate in a number of radio programmes of the Ministry of Agriculture in collaboration with the Agricultural Publicity Service. At present the pamphlets for extension have an average circulation of 250-300. All extension agents obtain one of each issue. A number of copies go to different divisions of the Ministry and of the Agricultural Experiment Station and to representatives of seed, fertilizer and crop protection products companies in the country. A stock is hold for visitors (farmers, students and others) at the office.

THE DIFFUSION OF INFORMATION ON CHEMICAL WEED CONTROL IN PEANUT FARMING

Information on chemical weed control in peanut was disseminated as stated before in general terms. In April 1976 a pamphlet was issued on this subject. This pamphlet of 4 pages contained technical information on the recommended herbicide (Lasso), the way to use it, the time to spray it, the recommended dose, the preparation of the spray solution, and so on.

In February, June and September 1977 meetings were organized at the demonstration garden to show the effect of Lasso on weed and peanut growth. Detailed information on this can be found in a report of Veltkamp, Veldkamp & Darmohoetomo (1978).

In two radiobroadcasts of the Ministry of Agriculture attention was paid to the possibilities of chemical weed control in peanut.

Furthermore a leaflet for farmers on this subject was issued in March 1977 (Anonymous, 1977). It was sponsored by the importer in Suriname. The circulation amounted to 750. Extension agents held farm demonstrations on chemical weed control in peanut cultivation in

one district. It is unknown to what extent extension agents gave information to farmers during personal visits. On an agricultural exhibition in one district also attention was paid to chemical weed control in peanut cultivation.

Last but not least the private activities of the foreman of the demonstration garden should be mentioned who worked temporarily also as a shopkeeper for agricultural products under which Lasso.

CHEMICAL WEED VERSUS HANDWEEDING IN PEANUT CULTIVATION

The time required for handweeding averages 205 hours/ha, while about 30 hours/ha are needed for spraying (Ter Horst, 1958). Labour costs are at present approx. Sf 1.75 per hour (1 Sf = US$ 0.55). Initially 6 l Lasso per ha was recommended, but this quantity has recently been lowered to 4 l/ha based on results in practice. Herbicide costs are at the moment Sf 11.25/l). The calculated financial advantage of chemical weed control with Lasso over handweeding is approx. Sf 280/ha (labour costs for spraying included).

Yields from Lasso sprayed peanut fields are at least of the same order as the yields of handweeded peanut fields (Dumas & Ausan, 1978) (see also table 1).

Table 1. Yields of peanut (kg air-dried unshelled nuts/ha) for two weed control methods in different demonstration fields

Demonstration field	Date of sowing	Yield	
		Handweeding	Chemical weed control with Lasso (6 l c.p./ha)
TK Dem 1977-3A	14 Jan. 1977	1360	1370
TK Dem 1977-3B	19 May 1977	1790	1700
TK Dem 1977-25	29 Aug. 1977	2610	2790
Average		1920	1950

AWARENESS AND ADOPTION OF LASSO IN PEANUT AMONG FARMERS

Methodology

In the period October 1977 – January 1978 peanut cultivating farmers in the principal peanut growing districts were interviewed about their awareness or adoption of chemical weed control in peanut cultivation. This was done by questionnaire. A total of 66 farmers with at least 0.04 ha peanut on their field were interviewed. The enumerators were officers of the division Contacts-with-the Agricultural Extension Service of the Agricultural Experiment Station. They were accompanied in the field by an extension agent of the districts concerned. The interviewed farmers cultivated 19.3 ha with peanuts.

CHARACTERISTICS OF THE FARMERS

Of the interviewed farmers 58% was full-time farmer. The others had another main profession (Government's service or something else). 53% of the farmers had received no schooling at all. Only 3% had the certificate of the elementary school. There were no farmers who had attended a secondary school. Among the farmers a rather low level of literacy was found: 56% could not read, whereas 24% could read reasonable or good. 58% of the farmers was over 50, 40% over 60 years of age. Farm size varied from 0.2 – 36 ha. Most farms (81%) sized less than 5 ha. The area cultivated with peanut varied from 0.04 – 3.0 ha. The average was 0.29 ha. 86% of the farmers cultivated in the period that the study took place 0.4 ha or less with peanut.

All farmers possessed a radio. 52% was not aware of the weekly radioprogramme (10 minutes) of the Ministry of Agriculture. The majority of the others who were aware of it listened more or less accidentally to the programme. 69% of them did not know exactly when the programme is broadcasted.

78% of the farmers never read a daily newspaper. Only one farmer had a subscription on a newspaper.

FINDINGS

Adoption of chemical weed control in peanut

One and a half years after its introduction chemical weed control in peanut cultivation with Lasso had been adopted by 17% of the peanut cultivating farmers, equalizing 24% of the area cultivated with peanut.

57% of the interviewed farmers was not aware of "somewhat" for the control of weeds in peanut. 20% of the farmers had heard about it but not adopted it, whereas 6% had sprayed Lasso in one season but did not continue.

Adopters

For all of them it was the first time that they used Lasso in their peanut field. 73% had not sprayed the whole peanut area. The adopters cultivated 4.6 ha with peanut of which 3.6 ha (78%) had been sparyed with Lasso. 91% of the adopters was fully content on the effect of Lasso on weed growth. One farmer (9%) had had a good control of annual grasses but not *Phyllanthus amarus* (gripe weed) ("fini bita"). The cause of it will be presumably the low quantity that was used (2.5 l c.p./ha).

None of the adopters had made a test before spraying Lasso to see how much spray solution was needed per hectare, in order to calculate the needed amount of Lasso per l water, as is recommended.

Disadopters

Four farmers (6% of the total interviewed persons) had used Lasso once for the control of weeds in peanut but did not use it in the next season again. Reasons they called for no further use were respectively: lack of money, lack of labour just after planting, had rotavated his area twice and did not expect much weeds and it rained rather much just after planting and he

thought that it could not be used under such weather conditions.

Reasons for non-adoption

Lack of knowledge accounted for 76% of all non-adoption reasons and formed the major constraint to adoption (table 2).

Table 2. Non-adoption reasons for chemical weed control in peanut

Non-adoption reasons	% Farmers (N = 55)
Lack of knowledge	76
Lack of money	7
Lack of materials	2
Lack of labour	2
Lack of conviction	4
Sufficient labour	2
Others	7

Media of information

First information

For the group of 27 farmers who had at least heard of Lasso the extension agents of the Agricultural Extension Service, the demonstration garden of the division Contacts-with-the-Agricultural Extension Service of the Agricultural Experiment Station and the foreman of the demonstration garden in his function of extension agent/shopkeeper were the most important first information sources (table 3). 17% of the farmers had received first information from mass media (radio or farmers' leaflet).

Table 3. First information source on chemical weed control in peanut

Information source	% Farmers (N = 27)
Extension agents Agric-Ext. Serv.	18
Foreman demonstration garden	18
Demonstration garden Agric. Exp. St.	18
Farmers leaflet	12
Radio	5
Family/friends	15
Other farmers	7
Demonstration plot Agric. Ext. Serv.	7

Further information

The 27 farmers who had heard at least of Lasso for chemical weed control in peanut mentioned totally 68 information sources; an average of 2.5 information source was called per farmer. The extension agent of the Agricultural Extension Service was cited most (table 4).

Table 4. Classification of information sources cited for chemical weed control in peanut

Information source	Number	Percentage
Radio	8	12
Farmers' leaflet	10	15
Daily newspaper	0	0
Family/friends	5	7
Foreman demonstration garden (local shopkeeper)	8	12
Other farmers	7	10
Demonstration plots Agric. Ext. Serv.	6	9
Extension agent Agric. Ext. Serv.	13	19
Demonstration garden Agric. Exp. St.	9	13
Shopkeeper (in town (Paramaribo))	2	3
Total	68	100

Most important information source

The farmers who had adopted Lasso were asked from whom or what they had obtained the most important information. Five of the eleven adopters answered a meeting at the demonstration garden, three the foreman of the demonstration garden acting as a local shopkeeper and further the farmers' leaflet, another farmer and an extension agent were all called once as the most important information source.

DISCUSSION AND CONCLUSIONS

Research data on the diffusion of information on improved farm practices in Suriname are scarce. Kalshoven (1977) focussed on environmental factors that accelerated or retarded the adoption of innovations by small rice farmers. Oomkes (1977) studied the diffusion of information on the control of the banana weevil *(Cosmopolites sordidus)* among plantain cultivating farmers. It regarded a recommendation given in 1956. To obtain reliable data on the channeluse at the different adoption stages was not possible. Comparable studies carried out in other countries do not breathe a word of similar problems. Katz et al. (1963) put a note of interrogation on the assumption that people can be asked to recall the channels of information and the influence of the decision to adopt an innovation or not. When the innovation is of recent date

as in our study such problems will be of much less extent.

Information on chemical weed control in peanut has been spread on a number of ways (leaflet, demonstration fields, personal visits, radio, advertisements in daily newspapers). In spite of that 57% of the farmers had never heard of chemical weed control in peanut. Lack of knowledge and lack of conviction accounted for 80% of all non-adoption reasons (table 2). The questions to be answered are why are farmers not aware of the innovation and why are those who are aware not convinced to adopt it. The group of farmers belonging to this last group was however only small.

To answer the question why farmers were not aware of the innovation in study several reasons can be mentioned:

– Till the end of 1976 there existed problems concerning the distribution of the pamphlets for the Agricultural Extension Service. Somehow the pamphlets remained within the Agricultural Extension Service and did not reach the extension agent in the field. Since the end of 1976 each extension agent receives a copy of each newly issued pamphlet personally by which this problem could be banished.
– Serious shortage of well-trained extension agents of the Agricultural Extension Service. Training on improved farm practices needs much more attention. Joint discussions on new information presented in pamphlets for the Agricultural Extension Service are not held systematically or not at all by most extension agents in the various districts. Visits at the meetings in the demonstration garden of the Agricultural Experiment Station need also much improvement (Veltkamp, Veldkamp & Darmohoetomo, 1978).
– Part of the farmers does not receive information on improved farm practices from extension agents. In our study 30%. It was 44% among a group of plantain cultivating farmers (Oomkes, 1977). Visits of farmers to the offices of the Agricultural Extension Service were limited; 91% did never go to the office.
– Only a low percentage of the farmers listened regularly to the radio programme of the Ministry of Agriculture. Of those who had heard of it 69% could not remember correctly when the programme was broad-casted.
– A rather high percentage was illiterate. Although 15% answered that they knew the farmers' leaflet on chemical weed control in peanut it remains a question what they have learned of it. In a study carried out in May 1977 among 28 peanut cultivating farmers who had received the farmers' leaflet on chemical weed control in peanut which had been distributed under pupils of a secondary school it appeared that two months after its distribution only 21% knew that "somewhat" was available for the control of weeds in peanut, 8% knew the correct needed amount per ha, 13% knew the correct time of spraying and no one knew the working period of the herbicide (Veltkamp, unpublished results).

It is possible that in reality the percentage of adopters is somewhat lower than the mentioned 17% in this study. This will be caused by the fact that no random sample of all peanut cultivating farmers could be taken on an easy way and the interviewed farmers were partly selected by extension agents.

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