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R&D ORIENTATION OF AGRICULTURAL CO-OPERATIVES AND AGRIBUSINESSES IN THE WESTERN CAPE AND KWAZULU-NATAL

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The eight biggest co-operatives and agribusinesses in Western Cape and KwaZulu-Natal were selected for a survey to determine the current and future level of R&D expenditure and human resources allocated to R&D. Furthermore, the survey assessed the perceptions of management and members/shareholders of the co-operatives/agribusinesses on the innovativeness, quality of R&D and the R&D capacity of their organisations and of the government and other private sector R&D institutions. The survey also covered the degree of satisfaction expressed by members/shareholders concerning their influence in determining the research agenda, as well as their opinion regarding the private sector's responsibility to finance R&D.

The results show that current expenditure on agricultural R&D as a percentage of annual turnover by the majority of co-operatives and agribusinesses in the Western Cape and Kwazulu-Natal is far below the international norm for companies trying to be internationally competitive. According to the perceptions of producers as members/shareholders of agricultural co-operatives/agribusinesses, as well as the management of these organisations the amount and the quality of R&D support by the South African Government to the commercial agricultural sector decreased. They have a negative view of the innovative capacity of the government R&D institutions in comparison with the capacities of their own organisations' or private sector organisations in general. They accept private sector's responsibility to finance R&D on a larger scale and intend to increase their own spending over the next five years. The reported perceptions suggest that agricultural co-operatives/agribusinesses have not compensated sufficiently for the decreasing government supported R&D and should develop a strong strategic R&D orientation to investigate potentially new production, processing and marketing activities continuously.

1 INTRODUCTION

This article reports the results of empirical research in 2000 of R&D orientation of co-operatives and agribusinesses in Western Cape and KwaZulu-Natal. The aim of this research was to determine to what extent and in what ways those agricultural institutions have adapted to the changing global and national policy environment with regard to agricultural R&D support. The investigation focused specifically on co-operatives and those ex-

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co-operatives which have been transformed into companies, referred to as agribusinesses. The eight biggest co-operatives and agribusinesses in Western Cape and KwaZulu-Natal were selected for the survey and can be regarded as representative of the co-operatives and agribusinesses in the two provinces. It must be realised that co-operatives and agribusinesses in the other provinces may have reacted significantly differently to the policy changes. This means that the impressions of the situation in the selected provinces cannot be generalised for the whole country. Neither can the performance of the co-operatives and agribusinesses investigated represent the performance of other input providing or processing agribusinesses.

Opinions from farmers on the R&D activities of their co-operatives/agribusinesses in addition to perceptions about funding by private sector institutions in general versus government supported R&D were obtained. Agricultural Research Council R&D was included under the latter, although the private sector contributes some 30 percent of its funding. Farmers' opinions were obtained via questionnaires distributed by mail with the support of the co-operatives/agribusinesses who supplied their member lists. Management of co-operatives and agribusinesses were interviewed. Co-operatives and agribusinesses are numbered so as not to reveal their identities. Numbers 1 to 4 represent co-operatives and agribusinesses in the Western Cape and numbers 5 to 8 represent co-operatives and agribusinesses in KwaZulu-Natal.

2. EXPENDITURE LEVELS AND GROWTH IN AGRICULTURAL R&D IN THE WESTERN CAPE AND KWAZULU-NATAL

2.1 Current and expected expenditure on R&D and extension

Based on a study into successful agricultural firms, ISNAR (1995) suggested that in order to be internationally competitive, five percent of an organisation's turnover should be re-invested into the firm in the form of research and development. As shown in Table 1, the Western Cape and KwaZulu-Natal co-operatives and agribusinesses interviewed indicated R&D investment levels ranging from zero to 0,5 percent of annual turnover, far below the five percent norm. Furthermore, several of the organisations have not only had low investment levels but, over the last five years, have also experienced a declining R&D expenditure as a percentage of turnover. In such cases, researchers are forced to make do with what little resources they have. This will result in decreasing research productivity and poor technology generation as well as a possible loss of experienced research personnel (Alston *et al*, 1998a and Pardey *et al*, 1997). In the longer term, the

result is an increasing inability to compete on the global level and, eventually, even on the local level. The predicted future R&D growth rates suggest that at least some of the agribusinesses realise their predicament and intend to invest heavily in R&D.

The reported reasons for the decline in R&D spending vary. Budget cuts, lack of understanding of the role of research, research system inefficiencies, irrelevant research outputs, and a decline in agricultural commodity prices have all been suggested as reasons for the decline (cf. also Tabor *et al*, 1998).

The average annual extension budget over the last five years was nearly double the average annual R&D budget over the same period. Co-operatives started to support or to take over agricultural extension from the government first, relying more heavily on Government for R&D. It can be expected that, once the co-operatives and the newly formed agribusinesses realise the extent and potential impact of the decreasing R&D output by Government, they will again compensate. The main issue is thus how fast these institutions will adapt their R&D activities in order to become globally more competitive.

Table 1: Current and expected expenditure on R&D and extension of co-operatives and agribusinesses in the Western Cape and KwaZulu-Natal[1]

Co-operative/ Agribusiness	Average annual R&D budget over last five years	Average total R&D expenditure as a percentage of turnover over the last five years	Average R&D budget growth rate (1994 – 1998)	Predicted future R&D budget growth rate	Average annual extension budget over last five years
	R	%	%	%	R
1	20 000	0.02	-[1]	30	900 000
2	0	0	0	0	534 000
3	300 000	0.5	-	15	0
4	4 000	-[1]	0.55	6	190 000
5	0	-	0	0	300 000
6	800 000	-	14.46	0	600 000
7	0	0	0	0	5 000
8	200 000	0.05	8.7	20	0
AVERAGE	165 500	0.19	7.45	8.9	316 125

[1] *The figures were not made available by the organisation in question*

2.2 Personnel allocated to R&D and extension by co-operatives and agribusinesses

Many of the co-operatives and agribusinesses do not have personnel assigned to R&D activities in the organisations (Table 2). The fact that the average number of extension personnel exceeds the R&D personnel, in accordance with the relative spending on R&D and extension, shows that traditionally the co-operatives and agribusinesses have seen their roles more as supporting the dissemination of research, rather than the creation and development of technological innovations.

Table 2: Employment of personnel to conduct R&D and extension activities by co-operatives and agribusinesses in the Western Cape and KwaZulu-Natal

Description	Co-operative/Agribusiness							
	1	2	3	4	5	6	7	8
Personnel assigned to R&D duties	0	0	1	0	0	3	0	1
Personnel exclusively assigned to extension duties	0	2	0	4	3	3	0	7

It seems that those organisations that have separated their research and extension activities run the unnecessary risk of allowing inefficiencies to creep in. In the United States, the administration of research and extension services was split up recently by structural adjustments due to a need for tighter control and the prioritisation of research. The aim was to improve the productivity of the various research and extension teams through specialisation, thereby improving their efficiency. However, this approach had serious implications for the research system as a whole. The separation of research and extension activities within the State agricultural experimental stations (SAESs) and Universities led directly to inefficiencies in production and administration. Furthermore, this form of structural adjustment lowered the incentive for co-operation amongst research institutions because of fear of competition (Alston *et al.*, 1998b).

3. INNOVATIVENESS OF AGRICULTURAL R&D INVESTMENT IN THE WESTERN CAPE AND KWAZULU-NATAL

3.1 Market research amongst agribusiness organisations

Market research preceding the improvement of existing products or the development of new products is seen as a prerequisite for effective product

innovation. The respondents' viewpoints on the barriers standing in the way of investing in market research are recorded in Table 3. Nearly all the organisations list a lack of funds as the biggest stumbling block towards establishing more market research agendas. Lack of member or shareholder support of R&D initiatives of co-operatives/agribusinesses seems to be seriously inhibiting innovation drives by these institutions. The lack of funds and member support can be addressed efficiently by developing a strong strategic orientation and an understanding of the importance of global competitiveness in order to survive and grow.

Table 3: Barriers to market research as rated by co-operatives and agribusinesses in the Western Cape and KwaZulu-Natal[1]

Barriers to market research	Co-operative/Agribusiness								Average
	1	2	3	4	5	6	7	8	
Producers do not want to finance research	2	4	3	-	-	4	5	4	3.7
Too little faith in satisfactory results	3	2	5	-	-	2	1	1	2.3
Lack of organisational funds	4	5	5	-	-	4	5	3	4.3
Returns too small	2	4	3	-	-	1	4	1	2.5
Returns too long term	2	3	1	-	-	1	3	1	1.8
Inadequate control over research results	2	4	1	-	-	3	3	2	2.5
Lack of member support even if funds are available	2	4	2	-	-	5	4	3	3.3
Lack of partners for joint ventures	4	5	2	-	-	4	5	3	3.8

[1] *A rating of 5 indicates a large barrier and a rating of 1 a small barrier.*

Various negative perceptions of the potential value, or regarding the control over the resulting innovations necessitate the cultivation of a stronger strategic orientation and management of the appropriability of the results. The unwillingness of organisations to conduct joint ventures forms another important obstacle. Joint ventures can bring about cost savings, pooling of human resources, etc. and can be particularly beneficial when plant material and technological expertise have to be obtained for production for the export market in order to exploit seasonal differences with the northern hemisphere.

3.2 Product development

Apart from a market driven approach, innovativeness is a strong influence on a company's competitive success (Webster, 1999). Innovation means

developing the product in tune with evolving consumer preferences. Table 4 shows that Western Cape co-operatives and agribusinesses focus more on traditional products, indicating limited acceptance of a strong R&D responsibility and a lack of fostering an R&D culture. The unfortunate longer term result is running the risk of stagnation and losing out on the potential benefits of innovations. These co-operatives and agribusinesses will struggle to achieve renewal and growth to succeed in a globalised market (Hough, 1996).

The case of co-operatives driving the introduction of canola in the Western Cape is a good example of R&D that necessitates co-operation among producers and input supply and product handling institutions. For instance, introducing new grain types and/or varieties can have a major impact on the welfare of a region.

Table 4: Agricultural innovations amongst co-operatives and agribusinesses in the Western Cape and KwaZulu-Natal

Co-operative/ Agribusiness	Product Description[1]					
	1	2	3	4	5	6
1	Tradi-tional	Tradi-tional	Inno-vative	-	-	-
2	Tradi-tional	Tradi-tional	Inno-vative	-	-	-
3	Tradi-tional	-	-	-	-	-
4	Innovative	Tradi-tional	Tradi-tional	Tradi-tional	Tradi-tional	Tradi-tional
5	Tradi-tional	Tradi-tional	Tradi-tional	Tradi-tional	Inno-vative	Innova-tive
6	Tradi-tional	-	-	-	-	-
7	Tradi-tional	-	-	-	-	-
8	Tradi-tional	-	-	-	-	-

[1] *A product classified as innovative is a new product or altered existing product introduced in the last five years while a traditional product is one that has been around for more than five years.*

The R&D drive of co-operatives and agribusinesses must be seen as supplementary to the R&D efforts of individual entrepreneurial producers on farm level. Individually, producers are also relatively more willing to

experiment with traditional products rather than with innovative ones. However, individual experimentation with innovative products are promising (refer to Table 5). The relatively higher percentage of producers experimenting with innovative products in some areas suggests a stronger innovative culture. The reasons for this phenomenon and methods for strengthening a culture of innovation need further investigation.

Table 5: Innovation amongst producers as members/shareholders of co-operatives and agribusinesses in the Western Cape and KwaZulu-Natal 2000

Description	Co-operative/Agribusiness								
	1	2	3	4	5	6	7	8	Average
Percentage producers experimenting with traditional products	20	8	5	10	14	14	15	24	13.75
Percentage producers experimenting with innovative products	16	4	4	16	19	4	5	4	9

4. PERCEPTION OF STAKEHOLDERS' ON THE QUALITY OF R&D

Regarding the response over the quality of research producers as members/shareholders of co-operatives/agribusinesses in both provinces show more faith in the R&D abilities of the private sector than that of the state (cf. Table 6). The majority of producers (36 percent) give the private sector a top rating with regard to quality of research, compared with 11 percent of producers giving the government the highest score. The confidence expressed in the quality of private sector R&D suggests that producers will be more willing to support contracting with private sector institutions to do research and product development and that the decrease in government support may not be regarded as too harmful. The management of the co-operatives and agribusinesses share the opinions of their members/shareholders that the private sector delivers higher quality R&D (see Table 7).

Producers want a say in the identification of research topics, based on their own perception of market demand and supply side factors. Judging from the response, the majority of producers in the grape industry are satisfied with their involvement in the determination of the research agenda. (refer to Table 8). The livestock industry suffers from severe producer dissatisfaction while the grain producers show a mixed response with regard to the determination of the research agenda.

Table 6: Producers' perceptions on the quality of research in Western Cape and KwaZulu-Natal[1]

Description	Rating[2]	Co-operative/Agribusiness								Average percentage of producers
		1	2	3	4	5	6	7	8	
Government	5	24	19	22	8	0	3	4	11	11
	4	20	37	19	8	11	11	4	20	16
	3	44	11	41	32	24	28	38	17	29
	2	12	31	5	34	26	17	27	22	22
	1	0	11	13	18	39	41	23	30	22
Private Sector	5	60	23	22	26	46	22	53	37	36
	4	28	66	22	29	30	39	19	26	33
	3	12	11	59	34	15	30	12	28	25
	2	0	0	6	11	7	9	16	7	5
	1	0	0	0	0	2	0	0	2	1

[1] *The figures in these columns represent the percentage of producers surveyed choosing the respective categories.*

[2] *A rating of 5 indicates a perception of high quality, a rating of 1 means low quality.*

Table 7: Opinions of management of co-operatives and agribusinesses in the Western Cape and KwaZulu-Natal on the quality of research

Co-operative/ Agribusiness	Management's opinion regarding quality of research	
	Government	Private sector
1	Not applicable	Not applicable
2	Dissatisfied	Dissatisfied
3	Dissatisfied	Satisfied
4	Dissatisfied	Satisfied
5	Dissatisfied	Extremely satisfied
6	Acceptable	Satisfied
7	Extremely dissatisfied	Satisfied
8	Extremely dissatisfied	Satisfied

5. PRODUCERS' SATISFACTION REGARDING THEIR INFLUENCE IN ESTABLISHING THE RESEARCH AGENDA OF AGRI-BUSINESSES AND RESEARCH INSTITUTIONS

Donors do not seem to be generally more or less satisfied than non-donors regarding their influence in determining the research agendas of their co-operatives and other research institutes. Members/shareholders of some co-

Table 8: Producers' satisfaction regarding the establishment of research objectives in the Western Cape and KwaZulu-Natal

Description		Co-operative/Agribusiness																	
		1		2		3		4		5		6		7		8		Average	
		D[1]	ND[2]	D[1]	ND[2]	D[1]	ND[2]	D[1]	ND[2]	D[1]	ND[2]	D[1]	ND[2]	D[1]	ND[2]	D[1]	ND[2]	D[1]	ND[2]
Grain industry	Satisfied %	64	0	75	22	22	47	41	16	65	63	72	86	81	75	80	66	63	49
	Dissatisfied %	36	100	25	78	78	53	59	84	35	37	28	14	19	15	20	34	37	51
Livestock industry	Satisfied %	40	0	70	35	38	32	35	29	24	20	59	67	27	15	28	10	40	26
	Dissatisfied %	60	100	30	65	62	68	65	71	76	80	41	33	73	85	72	90	60	74
Grape industry	Satisfied %	-	-	-	-	-	-	80	50	56	56	53	60	61	70	63	70	63	60
	Dissatisfied %	-	-	-	-	-	-	20	50	43	43	47	40	39	30	37	30	37	40

[1] *Donors who contribute to financing research.*
[2] *Non-donors who do not contribute in financing research.*

Table 9: Producers' faith in the technology creating abilities of their co-operative/ agribusiness, the government and the private sector in general in the Western Cape and KwaZulu-Natal[1]

Description	Rating[2]	Co-operative/Agribusiness								
		1	2	3	4	5	6	7	8	Av
Co-operative/ Agribusiness	1	20	0	9	5	0	0	49	0	10
	2	52	6	19	30	6	6	41	4	21
	3	24	34	34	33	4	34	10	26	21
	4	4	22	25	22	15	22	0	30	18
	5	0	38	13	10	75	38	0	40	27
Government	1	56	47	25	70	82	47	90	91	64
	2	24	25	38	26	11	25	5	9	20
	3	20	22	25	4	7	22	5	0	13
	4	0	6	5	0	0	6	0	0	2
	5	0	0	5	0	0	0	0	0	1
Private sector in general	1	0	0	5	0	0	0	0	0	1
	2	0	0	0	8	0	0	0	0	1
	3	0	3	34	29	0	3	4	5	10
	4	22	13	20	30	22	13	16	7	18
	5	78	84	41	33	78	84	80	88	71

[1] *The figures in these columns represent the percentage of members/shareholders of a co-operative/agribusiness giving the score.*
[2] *A rating of 5 indicates a very satisfied producer, a rating of 1 means a very dissatisfied producer.*

operatives/agribusinesses are more dissatisfied with the opportunities given them to affect the research agendas.

6. PERCEPTIONS OF OWN R&D CAPACITY AND THAT OF OTHER STAKEHOLDERS

Members/shareholders and the management of co-operatives/agribusinesses have a negative opinion of the innovative capacity of government agricultural R&D institutions (Table 9). Only 3 percent of them give a score of 4 or 5 to government, 45 percent give a score of 4 or 5 to their own co-operative/agribusiness, while 89 percent score the ability of the private sector in general a 4 or more. The management of the co-operatives/agribusinesses have positive, but more conservative, views on the innovative capacities of their organisations and the private sector in general, and are equally negative about the capacity of the government (cf. Table 10).

7. PERCEPTION OF STAKEHOLDERS' RESPONSIBILITIES TO FINANCE R&D

In recent U.S. studies, various economists estimated the returns to public research to be 30 to 40 percent, while in the United Kingdom and New Zealand the returns were estimated at 100 and 30 percent respectively (Mullen and Cox, 1995). Vink (2000) provided similar figures in his overview of results of returns to research studies in the South African context. Taking these benefits into account, it is not surprising that prominent economists, such as, Alston *et al.* (1998b) and Umali (1992), argue for increasingly more private sector participation within national agricultural research systems. The perceptions of the majority of members/shareholders of co-operatives/agribusinesses seem to be in line with this viewpoint. Some 80 percent of the members/shareholders believe that the private sector in general should assume responsibility for 40 percent or more of the R&D funding (see Table 11).

8. CONCLUSIONS

Current expenditure on agricultural R&D as a percentage of annual turnover by the majority of co-operatives and agribusinesses in the Western Cape and Kwazulu-Natal is far below the international norm for companies trying to be internationally competitive. Liberalisation of world agricultural trade demands a strategic orientation culminating, *inter alia*, in effective and sufficient R&D capacity building in order to have new products and services available in a rapidly changing environment. On the supply side, the amount

Table 10: Management's faith in the technology creating abilities of their co-operatives/ agribusiness, the government and the private sector in the Western Cape and KwaZulu-Natal

Description	Co-operative/Agribusiness							
	1	2	3	4	5	6	7	8
Own organisation	Dissatisfied	Dissatisfied	Satisfied	Satisfied	Satisfied	Dissatisfied, have no resources	Satisfied, but could be more	Satisfied
Government	Dissatisfied	Dissatisfied	Dissatisfied	Dissatisfied	Dissatis-fied	Dissatisfied	Dissatis-fied	Dissatisfied
Private sector	Dissatisfied	Dissatisfied	Satisfied	Satisfied	Satisfied	Dissatisfied	Satisfied	Satisfied

Table 11: Perceptions of members/shareholders of co-operatives/ agribusinesses in the Western Cape and KwaZulu-Natal regarding the ideal share of the private sector in financing R&D[1]

Description		Co-operative/Agribusiness								
		1	2	3	4	5	6	7	8	Av
Agribusiness's ideal share of responsibility	0-20%	20	0	13	5	0	2	0	0	5
	20-40%	16	17	47	19	12	9	8	0	15
	40-60%	28	48	9	55	32	33	31	55	36
	60-80%	24	9	6	11	13	35	12	25	17
	80-100%	12	26	25	11	43	21	49	25	27

[1] *Percentage of members/shareholders of co-operative/agribusiness giving the score.*

and the quality of R&D support by the South African Government to the commercial agricultural sector decreased, according to the perceptions of producers as members/shareholders of agricultural co-operatives/ agribusinesses, as well as the management of these organisations. They have a negative view of the innovative capacity of the government R&D institutions in comparison with the capacities of their own organisations' or private sector organisations in general. They accept the responsibility of the private sector to finance R&D on a larger scale and intend to increase their own spending over the next five years. This attitude is interpreted as a more pragmatic approach evolving in order to create their own future. The positive change in philosophy will have to be implemented and strengthened by strategic positioning in the global market and a careful selection and development of products and services through experimentation under local circumstances. The dominance of traditional products has been fine tuned and very limited attention has been given to new products, as well as limited market research. This trend suggests a lack of strategic orientation and/or limited implementation thereof to guide R&D activities. If this is not done effectively and timeously, member/shareholder support for funding R&D investment will become increasingly difficult as financial pressure due to stagnation gets more severe.

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