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The Impact of Investments in Maize Research and Dissemination in Zambia. Part II: Annexes

by

**Julie A. Howard
with George M. Chitalu and Sylvester M. Kalonge**

**MSU International
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**THE IMPACT OF INVESTMENTS IN MAIZE RESEARCH AND
DISSEMINATION IN ZAMBIA
PART TWO: ANNEXES**

By

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Appendix 4: Small- and medium-scale farmer maize adoption survey questionnaire

ZAMBIA MAIZE RESEARCH IMPACT STUDY
QUESTIONNAIRE – PRODUCER MAIZE ADOPTION SURVEY

CSA-SEA # _____

Household No. _____

Village _____

Enumerator _____

Date of Interview _____

Name of Farmer _____

Note: The questionnaire should be discussed with the head of the household (who may be either male or female), and, if possible, with both the leading male and female decision-makers.

Introduce yourself politely to the farmer and explain that you are working with the University of Zambia. Explain to the farmer that this survey is being conducted to determine how maize varieties developed by Zambian researchers have been adopted by farmers, and to understand the factors which have influenced farmer decisions about whether to use the new varieties or not. The information will assist national policymakers to design future maize research, extension and marketing systems that better meet the needs of the farmers. Finally, ask if the farmer has any questions.

PART A: BASIC INFORMATION ABOUT THE HOUSEHOLD

1. What is the SEX of the HOUSEHOLD HEAD? (Check one) ☐ 1 Female
☐ 2 Male
☐ 3 Both present
2. What GRADE in SCHOOL did you COMPLETE? (Enter grade completed) _____
3. Have you GROWN MAIZE AT SOME TIME during the period 1983-91?
(Check one) ☐ 1 Yes
☐ 2 No

If "yes," proceed to question 4. If "no," SKIP TO Q29.

4. What is the TOTAL NUMBER OF PERSONS living in this household today? (Include adults, children and other dependents WHO EAT FROM THE SAME POT.)

5. Of the TOTAL NUMBER OF PERSONS above, how many are LESS THAN 15 YEARS OF AGE?

PART B: FARM SIZE 1983/84-1991/92

(Note to enumerators: in this section and the ones that follow, the numbers assigned to the fields MUST BE CONSISTENT, i.e. field #1 in question 7 is the same as field #1 in questions 8, 13, 14, and so on.

Now I would like to discuss the SIZE OF YOUR FARM and HOW IT HAS CHANGED DURING THE PAST FEW YEARS.

6. How many fields do you have at the PRESENT time?
7. What is the SIZE of field 1 (in hectares, acres, limas or paces-- whatever unit the farmer is most comfortable with)?

Unit of measure

(continue for each field up to the total number of fields in Q6)

What is the SIZE of field 2?

What is the SIZE of field 3?

What is the SIZE of field 4?

What is the SIZE of field 5?

What is the SIZE of field 6?

TOTAL SIZE

- HH# _____
8. How did you PREPARE YOUR LAND FOR PLANTING this year? (make sure total number of fields is the same as farmer reported for Q6).

Field Number	Method of Preparation

PREPARATION METHOD CODES

- | | |
|---------------------|------------------------------|
| 1-Hand hoe | 5-Hand hoe and tractor |
| 2-Oxen | 6-Hand hoe, oxen and tractor |
| 3-Tractor | 7-Oxen and tractor |
| 4-Hand hoe and oxen | 8-Other (specify) |

9. Have you ever planted IMPROVED MAIZE? By IMPROVED MAIZE, I mean MAIZE SEED THAT HAS BEEN DEVELOPED BY RESEARCHERS AT MT. MAKULU RESEARCH STATION. THIS SEED CAN BE PURCHASED AT THE COOP DEPOT, ZAMSEED RETAIL STORE OR OTHER STOCKISTS. The names of improved maize varieties are MM-752, MM-604, MMV600, etc.

- () 1 Yes
() 2 No

If the answer is YES, PROCEED to question 10.

If the answer is NO, SKIP TO Q29.

10. IN WHAT YEAR did you begin PLANTING IMPROVED MAIZE FROM MT. MAKULU (should be 1984-5 or later; be sure to give the answer in terms of the **season**, e.g. 1985-6; 1988-9)?

11. Now I would like to discuss how the TOTAL NUMBER OF YOUR FIELDS AND THE SIZE OF EACH FIELD have changed beginning THE YEAR BEFORE YOU STARTED PLANTING IMPROVED MAIZE. HOW MANY FIELDS did you have in 19__ (year before year stated in Q10)?

12. Has the NUMBER OF FIELDS or the SIZE of any of the fields changed between 198__ (the year before the farmer began planting improved maize) and the present time?

- () 1 Yes
() 2 No

If NO, SKIP to Q14. If YES, PROCEED to Q13.

- HH# _____
13. Please describe the CHANGES in the SIZE AND/OR THE TOTAL NUMBER of FIELDS since you began planting improved maize.

Yr.	Field No.	Type of Change	Amount of Change	Unit

TYPE OF CHANGE CODES

- | | |
|-------------------------|---------------------------------|
| 1-Addition of new field | 3-Expansion of existing field |
| 2-Loss of field | 4-Contraction of existing field |

PART C: CROPPING PATTERNS 1983/84-1991/92

14. Now I would like to discuss the AREA you have planted to different crops SINCE THE YEAR BEFORE YOU BEGAN PLANTING IMPROVED MAIZE (SEE Q10) THROUGH THIS CROPPING SEASON. (Note to enumerator: refer to Q13 for the number of fields you should ask about in each year. Introduce the wooden model to the farmer and explain that the model is intended to represent EACH FIELD the farmer has planted in EACH YEAR since the YEAR BEFORE THE FARMER STARTED PLANTING IMPROVED MAIZE FROM MT. MAKULU. If IMPROVED MAIZE AREA or VARIETY changes between years, note this and the reasons for the changes in the last two columns of the table.)

[illegible]

CROP CODES

1-Maize	12-Pumpkin
2-Sorghum	13-Tobacco
3-Cassava	14-Cotton
4-Millet	15-Other(spec)
5-Soybean	16-Not cropped
6-Rice	17-Can't recall
7-Bean	18-Watermelon
8-Grdnut	19-Okra
9-Sw.pot.	20-Squash
10-Ir.pot.	21-Cucumber
11-Sunflr	22-Yam

VARIETY CODES

1-752	9-600	19-local-Senga
2-604	10-612	20-local-Mumba
3-603	11-SR52	21-popcorn
4-601	12-R201	22-local-Gankata
5-501	13-R215	23-local-Siluutuba
6-502	14-ZS206	24-ZH-1
7-504	15-other	25-yellow maize(spec.)
8-400	16-can't recall (local)	
	17-can't recall(improved)	
	18-local-Mulenga	

AREA/VARIETY CHANGE CODES

- 1-no change
- 2-improved maize area increase
- 3-change to different improved maize variety (specify)
- 4-improved maize area decrease
- 5-change from local to improved maize variety
- 6-change from improved to local maize variety
- 7-other (specify)
- 8-imp.maize area increase + change of variety
- 9-change from Zimb/Rhod.var to Zamb imp var.
- 10-imp maize area decrease and change of variety
- 11-change from Zambian to Zimb/Rhod. variety

15. How did you FIND OUT ABOUT IMPROVED MAIZE from Mt. Makulu? HH# _____

16. In general, what are the THREE MOST IMPORTANT REASONS WHY YOU STARTED TO GROW IMPROVED MAIZE? Please rank your responses IN ORDER OF IMPORTANCE.

1. _____
2. _____
3. _____

PART D: COMPLEMENTARY INSTITUTIONS

EXTENSION Next I would like to ask you about your EXPERIENCE WITH THE AGRICULTURAL EXTENSION SERVICE.

17. Have you EVER BEEN VISITED by an EXTENSION AGENT?

- ☐ 1 Yes
☐ 2 No

If no, SKIP to Q19. If yes, PROCEED to Q18.

18. What was the PURPOSE(S) of the visit?

19. Have you ever ADOPTED RECOMMENDATIONS concerning improved maize production?

- ☐ 1 Yes
☐ 2 No

If no, SKIP to Q21. If yes, PROCEED to Q20.

HH#__

20. Please SPECIFY the recommendations you ADOPTED in order of importance. By important, I mean in terms of INCREASING YOUR YIELD. Also, please tell me where or from whom you learned about these recommendations (Note to enumerator: proper names are not needed here, but institutional affiliation, e.g. extension agent, primary society officer, etc. is important.)

MAIZE RECOMMENDATIONS ADOPTED IN ORDER OF IMPORTANCE	SOURCE OF RECOMMENDATION

CREDIT. Now I would like to ask about CREDIT you have RECEIVED in the past for MAIZE-RELATED ACTIVITIES.

21. Have you ever RECEIVED CREDIT for INPUTS USED ON MAIZE, SUCH AS FERTILIZER, SEEDS, OR BAGS, or for OXEN OR OXEN-RELATED IMPLEMENTS, or TRACTOR HIRE for the purpose of PREPARING LAND to be PLANTED to MAIZE?

☐ 1 Yes

☐ 2 No

If no, SKIP to Q23. If yes, PROCEED to Q22.

HH#

22. In WHAT YEARS did you RECEIVE CREDIT for INPUTS USED ON MAIZE, or for OXEN OR OXEN-RELATED IMPLEMENTS, or TRACTOR HIRE for preparing land to be planted to maize? (Note to enumerator: for each year that farmer received credit for maize, oxen/oxen-implements, or tractor hire, ask about the source of credit, type of credit and amount of credit received.)

[illegible]

CREDIT TYPE CODES

1-Maize
2-Oxen/implements
3-Tractor hire
4-Other (specify)

CREDIT SOURCE CODES

1-Lima Bank
2-Primary Society
3-CUSA
4-AFC
5-Commercial Bank
6-Other (specify)
7-Other farmer

8-Church org.

8-Church org.
9-ZCF
10-Private
seller
11-DCU
12-PCU

TYPE CODES

1-Seeds
2-Fertilizer
3-Bags
4-Oxen
5-Implements
6-Cash
7-Other (specify)

UNIT CODES

1-50 kg
2-90 kg
3-10 kg
4-Kwacha
5-Other (specify)

23. For YEARS when you DID NOT RECEIVE CREDIT FOR MAIZE, why not? HH#

Year	Reason

FERTILIZER. Now I would like to discuss FERTILIZER USE ON IMPROVED MAIZE.

24. Have you EVER APPLIED CHEMICAL FERTILIZER to IMPROVED MAIZE?

() 1 Yes

() 2 No

If no, skip to Q26. If yes, proceed to Q25.

25. In WHAT YEARS did you USE CHEMICAL FERTILIZER on IMPROVED MAIZE? (Note to enumerator: for each year that the farmer used fertilizer on maize, ask the type, the type desired [if different from the type received], the source, amount and time of fertilizer delivery. Use a separate line for each type of fertilizer received in each year.)

Year	Fertilizer type received	Fertilizer type desired	Source	Amount	Unit	Time of fertilizer delivery

FERTILIZER CODES

Basal

1-X 5-V
2-D 6-R
3-A 7-L
4-C 8-Other basal

Top

9-Urea
10-Ammonium nitrate
11-Other top

SOURCE CODES

1-Primary society
2-NCZ
3-Namboard
4-Other (specify)
5-DCU
6-PCU
7-Private seller
8-Private voluntary organization
9-CUSA

UNIT CODES

1-50 kg
2-90 kg
3-10 kg
4-Other (spec.)

DELIVERY TIME CODES

1-Before planting
2-Just after planting
3-Germination to 1 month after germ.
4-More than 1 month after germination

HH# _____

26. SEED AVAILABILITY. Next I would like to discuss the AVAILABILITY OF IMPROVED MAIZE SEED. (Note to enumerator: look back at Q14. Determine from the table the years when improved maize seed was used, and what type was used. Enter these in the table below. For each year and type of improved maize seed used by the farmer, ask if the type of improved maize used was the type desired. If not, record the type desired. Also ask the source of each type of improved seed, and ask what month the maize seed was available at the source.)

[illegible]

VARIETY CODES

1-752 8-400
2-604 9- 600
3-603 10-612
4-601 11-R201
5-501 12-R215
6-502 13-ZS206
7-504 14-Other
15-can't recall, but improved

SOURCE CODES

1-Primary society
2-Zamseed Depot
3-Retail shop
4-Replanted
5-Other(specify)
6-DCU
7-PCU
8-Private seller
9-NAMBOARD

DELIVERY TIME CODES

1-Sept. or earlier
2-October
3-November
4-December
5-January
6-Can't recall

MAIZE MARKETING. Finally, I would like to discuss MARKETING of IMPROVED MAIZE.

HH# _____

If no, **TERMINATE** the **INTERVIEW**. Thank the farmer politely for his/her cooperation. If yes, **PROCEED** to Q28.

[illegible]

5-Sept.
6-Oct. or later

CONCLUDE the interview and THANK the farmer. Ask if he/she has any questions or comments he/she would like to add.

29. ADDITIONAL COMMENTS _____

Appendix 5: Large farmer maize adoption survey questionnaire

HH# _____

ZAMBIA MAIZE RESEARCH IMPACT STUDY
QUESTIONNAIRE - COMMERCIAL FARMER MAIZE ADOPTION SURVEY

Note: please complete this questionnaire only if you own or manage a farm on which 15 or more hectares of maize are usually planted each year.

1. District and province where farm is located _____
2. Are you the farm's (check all applicable).....

owner _____

manager _____

other(specify) _____
3. What is your sex?.....

male _____

female _____
4. What is your age?..... _____
5. How many years of formal education did you complete?..... _____
6. Have you ever planted any of the following maize hybrids/
varieties which were developed at Mt. Makulu Research
Station?

MM-752	MM-501	MMV-400
MM-604	MM-502	MMV-600
MM-603	MM-504	
MM-601	MM-612	

yes _____

no _____

If you answered "no" to question 6, please skip to question 9.

If you answered "yes" to question 6, please proceed to question 7.

7. In what season did you begin planting an improved maize hybrid/variety from Mt. Makulu (e.g. 1984-5, 1985-6, etc.)? _____
8. Please use the following table to describe the cropping/livestock pattern of your farm beginning the season BEFORE you began using an improved maize hybrid/variety from Mt. Makulu, and continuing through the 1992-93 (plans) season.
- Describe the crop/livestock pattern for every season since you began using improved maize from Mt. Makulu, although you may not have planted maize each year.
 - For each season, please ensure that the sum of the reported hectares given for crops, livestock and fallow land, equals the correct area of the farm in that year.
 - For seasons in which you changed maize varieties/hybrids, or your hectareage of Mt. Makulu maize changed (increased or decreased) by more than 10%, briefly explain the reason why in the last column.

EXAMPLE. Farmer Z. began growing MM752 in the 1984-5 season. Prior to 1984-85, he grew SR52, then switched to MM752 because he expected higher yields. He continued to grow about the same hectareage of Mt. Makulu improved maize between 1984-88, along with other crops--soybean, tobacco, local maize intercropped with watermelon and pumpkin for the workers--and cattle. In the 1986-7 season, Z. experimented with MM-603 and R215, then switched back to MM-752 the following year because of its superior yield under good management. He decreased his maize area beginning in the 1988-89 season because of unfavorable product and input prices, and because he wanted to increase his cattle herd and his tobacco hectareage (to take advantage of the export retention scheme). In 1991-92, however, Z. increased the maize hectareage again because he anticipated higher producer prices.

(EXAMPLE)

Year	Crop or livestock type	Variety type (MAIZE ONLY)	Intercrop	Area-- specify # and unit (acre,ha or lima) or # of animals	Reason for improved maize area/variety change (specify)
83-4	MAIZE	SR-52	-	20 HA	
83-4	MAIZE	LOCAL	PUMPKIN, WATERMELON	5 HA	
83-4	SOYA	-	-	30 HA	
83-4	BEEF CATTLE	-	-	40 HEAD	
83-4	PASTURE/ FALLOW	-	-	10 HA	
			TOTAL	65 HA	
84-5	MAIZE	MM752	-	20 HA	EXPECTED HIGHER YIELDS WITH MM752
84-5	MAIZE	LOCAL	PUMPKIN, WATERMELON	5 HA	
84-5	SOYA	-	-	20 HA	
84-5	BEEF CATTLE	-	-	50 HEAD	
84-5	PASTURE/ FALLOW	-	-	20 HA	
			TOTAL	65 HA	

(CONTINUES THROUGH 91-2 SEASON) END OF EXAMPLE

HH# _____

[illegible]

9. Please comment on your experience with Mt. Makulu improved maize hybrids/varieties, or, if you have never used Mt. Makulu varieties/hybrids or have discontinued using them, please explain why.

10. What crop problems (including all crops, not just maize) would you like the Research Branch to work on? Please rank these in order of their importance to you.

1.

2.

3.

4.

5.

11. Additional comments _____

THANK YOU VERY MUCH FOR YOUR ASSISTANCE.

Appendix 6: GRZ and donor expenditures on maize research and the seed industry

Table 30: Estimated GRZ expenditures on maize-related research, 1978-91 (financial values)^a

ml. ZK

ITEM	1978 ^a	1979	1980	1981	1982	1983
PERSONAL EMOLUMENTS^b						
Salaries		.1722	.1757	.2106	.2674	.2971
RECURRENT DEPARTMENTAL CHARGES^c						
General Expenses		.0439	.0521	.0684	.0992	.0937
Traveling on Duty		.015	.0168	.023	.0353	.035
Field Services (General)		.0868	.0987	.1261	.1445	.1614
Seed Production/Seed Control Services		.0321	.0939 ^e	.0311	.0259	.0437
Cereal Research Team						.0144
CAPITAL EXPENDITURES^d						
Mt. Makulu Research Station		.0118	.0185	---	.0212	.0118
Cereals Research Team		.007	.0371	---		
Seed Production Project ^e		.1409	.1216	.0563 ^e	.1045	.0304
Mouldy Maize Project		.0194	.032	.035	.028	
Research Training and Extension ^f				(.2)	(.3089)	(.0293)
Adaptive Research Planning Team ^g					.0158	.0389
TOTAL EXPENDITURES	.4337	.5291	.6464	.5505	.7418	.7264

^a Based on actual expenditures reported in GRZ Financial Reports, 1979-91

^b Maize-related amount estimated as 25 per cent of total Agricultural Research Branch salaries. Based on per cent of scientists engaged full-time or part-time in maize research (Kean and Singogo, 1989)

^c Maize-related amount estimated as 25 per cent of expenditures by the Agricultural Research Branch

^d Maize-related amount estimated as 25 per cent of expenditures, except for Mouldy Maize Research (100% of expenses attributed to maize research)

^e Partially funded by Belgium

^f Fully funded by SIDA; to avoid double-counting, not included in this total

^g Partially funded by USAID; maize-related amount estimated as 25 per cent of expenditures

Table 30: Estimated GRZ expenditures on maize-related research, 1978-91^a (financial values) (con't)

ml. ZK

ITEM	1984	1985	1986	1987	1988	1989	1990	1991 ^m
PERSONAL EMOLUMENTS ^b								
Salaries	.644	.7277	1.113	1.124	1.698	2.936	2.5	4.825
RECURRENT DEPARTMENTAL CHARGES ^c								
Allowances	.0091	.0293	.0478	.0636	.0986	.1177	.8537	.1568
Purchase of Goods	.0529	.1376	.1975	.1950	.5107	.5888	1.935	1.236
Purchase of Services	.0153	--	.2883	.0376	.7168	.1221	3.173	1.722
CAPITAL EXPENDITURES ^d								
Mt. Makulu Research Station ^e	.0048	.011	.00078	.0055	.0028	.0046	.0386	.4000
Seed Production Project/Seed Control Institute ^f	(.1092)	(.1201)		--	(.5570)	(.1265)	(.1072)	(.75)
Research Training and Extension ^g	.3212	.1964	.1064	.1273	.0778	--		
Adaptive Research Planning Team ^h	.032	.0451	.1392	.9181	1.009	.8515	2.525	16.730
Buildings, Housing, Civil Works ⁱ		.0223	.0156	.0097	.2247	.1787	.7656	.1675
Agricultural Research Project (ZAREP) ^j				.0182	.1704	.3626	2.286	86.863
Crop Research ^k				(.3276)	(.5568)	(1.227)	(.2297)	(2.078)
Maize Research Extension ^l							(.756)	(.200)
TOTAL EXPENDITURES	1.079	1.160	1.909	2.499	4.508	5.162	14.076	112.10

^b Partially funded by CIMMYT, Netherlands, SIDA, NORAD, IFAD; maize-related amount estimated as 25 per cent of expenditures

ⁱ Partially funded by NORAD, SIDA; maize-related amount estimated as 25 per cent of expenditures

^j Funded by NORAD, African Development Bank and World Bank; maize-related amount estimated as 25 per cent of expenditures

^k Funded by SIDA; maize-related amount estimated as 25 per cent of total expenditures. To avoid double-counting, not included in this total.

^l Funded by FAO/UNDP; 100 per cent of expenditures attributed to maize research. To avoid double-counting, not included in this total.

^m 1991 data are total provisions for each category; actual expenditure data not available

^a Estimated; expenditure data not available for 1978

Table 30a: Estimated GRZ expenditures on maize-related research, 1978-91 (economic values)

ml. ZK

ITEM	1978 ^d	1979	1980	1981	1982	1983
PERSONAL EMOLUMENTS^a						
Salaries		.1722	.1757	.2106	.2674	.2971
RECURRENT DEPARTMENTAL CHARGES^b						
General Expenses		.1401	.1674	.2246	.3416	.244
Traveling on Duty		.015	.0168	.023	.035	.035
Field Services (General)		.277	.3171	.4141	.4976	.4203
Seed Production/Seed Control Services		.1025	.3017	.1021	.8919	.1138
Cereal Research Team						.0375
CAPITAL EXPENDITURES^c						
Mt. Makulu Research Station		.0411	.0649	---	.0799	.0333
Cereals Research Team		.0239	.1301	---		
Seed Production Project		.4910	.4265	.202	.3939	.0857
Mouldy Maize Project		.0676	.1126	.1256	.1055	
Research Training and Extension				(.200)	(.3089)	(.0293)
Adaptive Research Planning Team					.0596	.1096
TOTAL EXPENDITURES	1.091	1.331	1.712	1.302	1.870	1.376

^a There are no tradeable goods in this category

^b The content of tradeable goods in this category is estimated at 75%, except for traveling on duty and allowances, which have no tradeable goods

^c Tradeable goods content in this category is estimated at 85%

^d Estimated; actual expenditure data were unavailable

^e Estimated; actual expenditure data were unavailable

Table 30a: Estimated GRZ expenditures on maize-related research, 1978-91 (economic values) (con't)

mln ZK								
ITEM	1984	1985	1986	1987	1988	1989	1990	1991 ^a
PERSONAL EMOLUMENTS ^a								
Salaries	.644	.7277	1.113	1.124	1.698	2.936	2.5	4.825
RECURRENT DEPARTMENTAL CHARGES ^b								
Allowances	.0091	.0293	.0478	.0636	.0986	.1177	.8537	.1568
Purchase of Goods	.1178	.1581	.1554	.248	.7911	.8283	3.712	2.142
Purchase of Services	.0341	--	.2269	.0478	1.110	.1718	6.086	2.984
CAPITAL EXPENDITURES ^c								
Mt. Makulu Research Station	.0115	.0013	.00059	.00719	.00454	.00672	.0788	.7322
Seed Production Project/Seed Control Institute	(.1092)	(.1201)		--	(.557)	(.1265)	(.1072)	(.750)
Research Training and Extension	.768	.2295	.0807	.1665	.1262	--		
Adaptive Research Planning Team	.0765	.0527	.1056	1.201	1.636	1.244	5.153	30.625
Buildings, Housing, Civil Works		.0261	.0118	.0127	.3645	.2611	1.562	.3066
Agricultural Research Project (ZAREP)				.0238	.2764	.5297	4.664	159.001
Crop Research				(.3276)	(.5568)	(1.227)	(.2297)	(2.078)
Maize Research Extension							(.756)	(.200)
TOTAL EXPENDITURES	1.661	1.225	1.742	2.894	6.105	6.095	24.610	200.773

^a There are no tradeable goods in this category

^b The content of tradeable goods in this category is estimated at 75%, except for traveling on duty and allowances, which have no tradeable goods

^c Tradeable goods content in this category is estimated at 85%

^d Estimated; actual expenditure data were unavailable

^e Estimated; actual expenditure data were unavailable

Table 31: USAID expenditures on Zambia Agricultural Development, Research and Extension (ZAMARE) 1983-88^a

ml. USD

ITEM	1983-4	1984-5	1985-6	1986-7	1987-8 ^b	TOTAL
Salaries, Travel, Allowances for Field and Home Office Staff	.603	.700	.8266	.8748		3.004
Other Direct Costs	.295	.3127	.2311	.1921		1.031
Participant Training	.8201	.8138	.9206	.844		3.399
Other ^c	1.016	1.016	1.016	1.016	1.016	5.081
TOTAL EXP.	2.734	2.843	2.995	2.927	1.016	12.515
EST. MAIZE-RELATED EXP. ^d	.6836	.7107	.7486	.7318	.2541	3.129
ZK equivalent at OER ^e (mln ZK)	.8333	1.566	4.26	9.327	2.031	
ZK equivalent -- economic value ^f (mln ZK)	2.909	3.738	4.986	7.056	2.659	

^a Source: USAID (1988), USAID (1991).

^b Breakdown of expenditures not available for 1987-8

^c Difference between expenditures reported under contract AFR-0201-C-00-1097 and total life-of-project expenditures for 611-0201.

^d 25 per cent of total project costs are attributed to maize research and extension. This represents a weighted average of person-years of technical assistance directly related to maize research, proportion of students trained in maize-related areas, and commodities/housing and operational recurrent costs attributed to maize research and extension.

^e For the financial analysis, USD maize-related expenditures are converted to ZK using the nominal ZK/SDR and SDR/USD rates.

^f For the economic analysis, 85% of maize-related USD costs are converted to ZK using the SER.

Table 32: SIDA expenditures on research and seed, 1979-92^a

ml. ZK							
ITEM	1979	1980	1981	1982	1983	1984	1985
RESEARCH AND SEED PROGRAMME	.485 ^b						
Basic/Breeder seed production		.08			.042	.122	.355 ^c
Seed Control/Testing/SCCI		.1	.15	.17	.15	.554	.322
Seed Company		.15					2.08
Seed Training		.025	.05	.075	.050	.063	.139
Personnel/Consultancy		.195					
Management Agreement			1	1.055	1.092	1.443	2.140
Housing, Zamseed				.200	.200		
Operation Costs, Research/Mt. Makulu					.074		
ARPT-Luapula Province						.305	.411
TOTAL EXPENDITURES	.485	.550	1.2	1.5	1.608	2.182	5.447
ESTIMATED MAIZE RESEARCH EXPENDITURES ^d	.0606	.0688	.025	.2638	.302	.4675	.7265
ZK equiv. at OER ^e	.0606	.0688	.25	.2638	.302	.4675	.7265
ZK equiv.—economic value ^f	.2113	.2411	.8972	.9942	.8511	1.118	.8489
ESTIMATED MAIZE SEED EXPENDITURES ^g	.1649	.188	.48	.6	.5968	.824	1.872
ZK equiv. at OER	.1649	.188	.480	.600	.5968	.824	1.872
ZK equiv.—economic value	.5746	.6594	1.723	2.262	1.682	1.970	2.188

^a Source: SIDA Joint GRZ/SIDA Agricultural Sector Support Programme Budget and Annual Review, 1979-1991. Amounts are budgeted amounts, not actual expenditures. Actual expenditure information was not available.

^b Breakdown of budget not available. Proportions to maize research and maize seed expenditures based on 1980 proportions.

^c Includes research budget

^d Maize research expenditures are estimated as follows: 25% of general research-related expenditure categories, i.e. basic/breeder seed production, ARPT, research operation costs, based on per cent of scientists engaged full or part-time in maize research (Kean and Singogo, 1989); 25% of management agreement and personnel/consultancy categories; 100% of maize research expenditures.

Table 32: SIDA expenditures on research and seed, 1979-92^a (con't)

ml. Swedish kroner

ITEM	1986	1987	1988	1989	1990	1991
RESEARCH AND SEED PROGRAMME						
Agricultural Research and Breeder Seed Production	1.442					
Seed Control/Testing/SCCI	1.398	1.675	1.5	1.175	1	.840
Seed Company	6.139	2.145	.3	.556		
Seed Training	.735	1.009	1.280	1.729	2.327	3.020
Personnel/Consultancy						
Management Agreement	10.577	12.074	12.376	13.283	13.106	12.173
Housing, Zamseed						
Maize research		1.466	1.635	1.890	2.703	2.507
ARPT	3.8	3.908	4.410	4.082	4.132	3.614
TOTAL EXPENDITURES	24.091	22.277	21.510	22.715	23.268	22.154
ESTIMATED MAIZE RESEARCH EXPENDITURES ^d	3.955	5.462	5.832	6.231	7.013	6.454
ZK equiv. at OER ^e ('000 ZK)	7.373	7.472	9.473	21.275	52.752	103.277
ZK equiv.--economic value ^f ('000 ZK)	5.593	9.774	15.368	31.081	107.65	189.05
ESTIMATED MAIZE SEED ^g EXPENDITURES	7.54	6.761	8.03	6.697	6.573	6.413
ZK equiv. at OER ('000 ZK)	14.056	9.25	13.045	22.867	49.447	102.633
ZK equiv.--economic value ('000 ZK)	10.663	12.1	21.163	33.406	100.91	187.86

^e 1979-85 SIDA investments were reported in ZK. It is assumed that these were converted from SEK at the official exchange rate.

^f 1986-91 investments were reported in SEK. These costs were converted to ZK using the ZK/SDR and SEK/SDR rates (Table 23)

For the economic analysis, 85% of maize-related costs are converted to ZK using the SER.

^g Maize seed expenditures: 40 per cent of seed-related expenditures (seed control/testing, seed company, seed training, personnel/consultancy, management agreement, housing-Zamseed) are attributed to maize, since maize sales represent approximately 40 per cent of the total value of seeds sold by Zamseed (maize sales represented 47.8% of the total value of seeds sold in 1985/6, and 34.7% of total value of seeds sold in 1990/91 (Zamseed records).

^h For the economic analysis, 85% of maize-related costs are converted to ZK using the SER.

Table 33: FAO/UNDP expenditures on maize research, 1978-87, and maize/legume research, 1987-92^a

ml. USD

ITEM	1978	1979	1980	1981	1982	1983	1984	1985
TOTAL EXPENDITURES	.1733	.1733	.1733	.1733	.1733	.1733	.1733	.1733
ESTIMATED MAIZE-RELATED EXPENDITURES	.1733	.1733	.1733	.1733	.1733	.1733	.1733	.1733
ZK equiv. at OER ^c ('000 ZK)	.1357	.1342	.1386	.1519	.1602	.2119	.3819	.9877
ZK equiv.--economic value ^d ('000 ZK)	.4685	.4676	.4861	.545	.604	.597	.9131	1.154

ITEM	1986	1987 ^b	1988	1989	1990	1991	1992	TOTAL
TOTAL EXPENDITURES	.1733	.1733	.1733	.1733	.1733	.1733	.1733	2.6
ESTIMATED MAIZE-RELATED EXPENDITURES	.1733	.0867	.0867	.0867	.0867	.0867	.0867	2.079
ZK equiv. at OER ^c ('000 ZK)	2.203	.6936	.8672	1.843	3.716	7.674	14.1	33.4
ZK equiv.--economic value ^d ('000 ZK)	1.671	.907	1.407	2.693	7.584	14.048	27.960	61.506

- ^a Annual expenditure data was not available. Estimated based on FAO (1990) and personal communications with maize team members.
- ^b Beginning in 1987, the FAO/UNDP-funded project expanded to include legume research. Maize-related expenditures are estimated at 50% of the total.
- ^c For the financial analysis, USD maize-related expenditures are converted to ZK using the nominal ZK/SDR and SDR/USD rates.
- ^d For the economic analysis, 85% of maize-related USD costs are converted to ZK using the SER.

Table 34: CIMMYT expenditures on Zambia maize research 1980-92^a

ml. USD							
Year/Item	1980	1981	1982	1983	1984	1985	1986
BREEDING PROGRAM							
CIMMYT Team Member Visits to Zambia	.01	.01	.01	.01	.01	.01	.01
In-country training						.05	.05
Training at CIMMYT/Mexico		.0014	.0014	.0014	.0014	.0014	.0014
Visiting scientists sent to CIMMYT/ Mexico				.0073	.0073	.0073	.0073
Zambian participation in regional maize workshops						.007	
Zambian maize team training in Harare (@\$500)	.002	.002	.002	.002	.002	.002	.002
Subtotal, Breeding Program	.012	.0134	.0134	.0207	.0207	.0777	.0707
MAIZE AGRONOMY AND MAIZE-RELATED ON-FARM RESEARCH							
ARPT planning studies		.0025	.0025				
OFR in-country training					.0075	.0075	
Cooperative research, UNZA							
OFR research, training, Southern Province							
OFR research, training, Lusaka and Central Provinces							.0011
OFR regional training workshops, U.Zimb.				.0034	.0034	.0034	.0034
OFR trial data analysis workshop, Harare							
Maize agronomy courses, CIMMYT/Mexico							
Regional OFR and Maize conferences						.0027	
Subtotal, Maize Agronomy and OFR	0.0	.0025	.0025	.0034	.0109	.0136	.0045
TOTAL CIMMYT EXPENDITURES	.012	.0159	.0159	.0241	.0316	.0913	.0752
ZK equiv. at OER ^b ('mln ZK)	.0096	.01398	.01474	.02938	.06965	.5196	.95849
ZK equiv.--economic value ^c ('mln ZK)	.03367	.05021	.05573	.10151	.16624	.60798	.72545

Table 34: CIMMYT expenditures on Zambia maize research 1980-92 (con't)

ml. USD

Year/Item	1987	1988	1989	1990	1991	1992
BREEDING PROGRAM						
CIMMYT Team Member Visits to Zambia	.01	.01	.01	.01	.01	.01
In-country training	.05	.05	.05	.05	.05	.05
Training at CIMMYT/Mexico	.0014	.0014	.0014	.0014		
Visiting scientists sent to CIMMYT/ Mexico	.0073	.0073	.0073			
Zambian participation in regional maize workshops	.007		.007			
Zambian maize team training in Harare (@\$500)	.002	.002	.002	.002	.002	.002
Subtotal, Breeding Program	.0777	.0707	.0777	.0634	.062	.062
MAIZE AGRONOMY AND MAIZE-RELATED ON-FARM RESEARCH						
ARPT planning studies						
OFR in-country training						
Cooperative research, UNZA	.005	.005	.005			
OFR research, training, Southern Province	.009	.009				
OFR research, training, Lusaka and Central Provinces	.0011	.0011	.0011	.0011	.0011	.0011
OFR regional training workshops, U.Zimb.	.0034	.0034	.0034	.0034	.0034	.0034
OFR trial data analysis workshop, Harare	.0015	.0015	.0015	.0015	.0015	.0015
Maize agronomy courses, CIMMYT/Mexico	.0168	.0168	.0168	.0168	.0168	.0168
Regional OFR and Maize conferences	.0027		.0054			.0027
Subtotal, Maize Agronomy and OFR	.0395	.0368	.0332	.0228	.0228	.0255
TOTAL CIMMYT EXPENDITURES	.1172	.1075	.1109	.0862	.0848	.0875
ZK equiv. at OER ^b ('mln ZK)	.93678	1.0718	2.3653	3.7017	7.5063	14.23
ZK equiv.--economic value ^c ('mln ZK)	1.2264	1.7434	3.5023	7.5196	13.85	28.004

* Estimates (personal communications: Gelaw, 1991; Waddington, 1993; Low, 1993)

^b For the financial analysis, USD expenditures are converted to ZK using the nominal ZK/SDR and SDR/USD rates.

^c For the economic analysis, 85% of USD costs are converted to ZK using the SER.

Table 35: Zamseed investments 1981-2000^a

ml. ZK

	1981	1982-3	1983-4	1984-5	1985-6	1986-7	1987-8	1988-9	1989-90	1990-91	1991-2	1992-3	1993-2000
Land					2								
Industrial Buildings		.1	.8	.5	2	1.1	.146		1.797		1.628		
Staff Houses			.4	.4	2	.3	.146			1.176			
Motor Vehicles	2		.1		2	1.2		.1731		.7843		20.938	
Furniture, equipment		.3	.4		1.5	2.9		.3462		1.569			
TOTAL	1	.4	2.6	.9	4.1	5.5	.292	.5194	1.797	3.529	1.628	20.938	20.938
Less SIDA investments ^b		.2	.2		2.08	1.879	.720	.133	.521	0	0	0	0
TOTAL	1	.2	2.4	.9	2.02	3.621	0	.3864	1.276	3.529	1.628	20.938	20.938
Estimated maize seed-related expenditures ^c	.4	.08	.96	.36	.808	1.448	0	.1545	.510	1.412	.651	8.375	8.375
Economic values ^d	1.435	.3016	2.705	.8607	.9442	1.099	0	.2507	.7455	2.881	1.192	16.608	16.608

^a Source: Norrby, 1986 and Zamseed reports

^b See Table 32. Includes SIDA expenditures for seed company and housing, Zamseed

^c 40 per cent of seed-related expenditures are attributed to maize, since maize sales represent approximately 40 per cent of the total value of seeds sold by Zamseed (maize sales represented 47.8% of the total value of seeds sold in 1985/6, and 34.7% of total value of seeds sold in 1990/91 (Zamseed records)).

^d For the economic analysis, 85% of maize seed-related costs are estimated to be tradeable goods.

Appendix 7: GRZ and donor expenditures on maize extension, 1984-91

**Table 36: Estimated GRZ and donor expenditures on maize extension, 1984-91
(financial values)^a**

ml. ZK

ITEM	1984	1985	1986	1987	1988
Personal Emoluments	5.559	6.049	8.989	6.455	8.502
Allowances	.1264	.2035	.4134	.272	1.330
Purchase of Goods	.3993	.3043	.479	.5337	1.363
Purchase of Services	.1203	.1454	.2289	.2048	.5036
Training Expenses	.1346	.2085	.35	.3236	.6724
CAPITAL EXPENDITURES					
Lima Program ^b	.209	.1402	.2122	.5114	.4452
Village Agricultural Project, No.Prov. ^c	.2502	.4766	1.973	2.271	3.365
Motor Vehicles		.0457	.0045	.0204	.0029
Staff Housing			.0257	.1676	
Seed Control Institute ^b			.4246	.3848	
NAT'L FARMING INFORMATION SERVICE					
Personal Emoluments	.1431	.1303	.2171	.1748	.3606
Recurrent Charges	.004	.011	.0315	.0601	.0905
Purchase of Goods	.0339	.0635	.1045	.2059	.2742
Purchase of Services	.0042	.0095	.0202	.2925	.3975
Office Equipment, Vehicles		.0279	.0880	.1953	.0756
Rural Information Services		.0093	.0487	.0605	
Staff Housing		.0265	.0264	.0725	
CAPITAL EXPENDITURES -- MAWD HEADQUARTERS					
Integrated Rural Dev. Program (IRDP) ^d	.9641	1.681	4.743	7.790	6.913
IRDP-NW Province ^e	2.239	.9849	1.381	1.643	1.702
IRDP-Serenje, Mpika, Chinsali ^f	.0453	.7319	2.061		.00092
Central Prov. Maize Production Project ^g	.1913	.0747	1.252	1.548	2.13
So. Prov. Ag.Dev. Project ^h	1.988	1.733	2.917	1.117	1.172
North-Western Area Dev. Project ⁱ	.412	1.335	1.788	2.558	3.356

**Table 36: Estimated GRZ and donor expenditures on maize extension, 1984-91
(financial values)(con't)**

ml. ZK

ITEM	1984	1985	1986	1987	1988
Eastern Province Ag. Dev. Project ^a		4.386	7.222	2.19	.912
Oxen Supply Training Centre ^j		.004	.0033	.0047	2.358
Ag. Res. and Development ^e				.4954	.6691
Agricultural Extension Services ^d					.0376
Staff Housing			.0192	.0975	.3085
TOTAL MAIZE-RELATED EXPENDITURES	12.823	18.782	35.022	29.648	36.942

- ^a Based on actual expenditures reported in GRZ Financial Reports, 1984-91. 40 per cent of total expenditures in each category are attributed to maize extension, except where noted
- ^b Partially funded by SIDA and FINNIDA
- ^c Partially funded by NORAD
- ^d Partially funded by SIDA
- ^e Partially funded by the Federal Republic of Germany
- ^f Partially funded by the United Kingdom
- ^g Partially funded by EEC; 100 % of expenditures attributed to maize
- ^h Partially funded by World Bank, IDA loan
- ⁱ Partially funded by IFAD, UK, GTZ, FINNIDA
- ^j Partially funded by Netherlands

**Table 36: Estimated GRZ and donor expenditures on maize extension, 1984-91
(financial values)(con't)**

ml. ZK

ITEM	1989	1990	1991 ¹
Personal Emoluments	14.334	20.561	4.746
Allowances	1.417	3.393	.7308
Purchase of Goods	2.109	3.771	.6768
Purchase of Services	.726	1.514	2.308
Training Expenses	4.997	.8667	.1292
CAPITAL EXPENDITURES			
Lima Program ^b	.3539	.6385	.04
Village Agricultural Project, No.Prov. ^c	3.412	3.294	
Motor Vehicles, Movable Assets	.4191	1.983	4.271
Staff Housing			
Seed Control Institute ^b			
NAT'L FARMING INFORMATION SERVICE			
Personal Emoluments	.4023	1.188	3.715
Recurrent Charges	.1386	.6197	.606
Purchase of Goods	.3769	1.367	.5216
Purchase of Services	.5807	1.228	5.222
Office Equipment, Vehicles	.1332	.5123	.7752
Rural Information Services	.0195	.0289	.050
Staff Housing	.0875	.1103	.1404
CAPITAL EXPENDITURES -- MAWD HEADQUARTERS			
Integrated Rural Dev. Program (IRDP) ^d	10.218	26.989	.36
IRDP-NW Province ^e	1.549	6.192	1.575
IRDP-Serenje, Mpika, Chinsali ^f			
Central Prov. Maize Production Project ^g	2.282	4.9	192.547
So. Prov. Ag.Dev. Project ^h	1.301	.7274	.080
North-Western Area Dev. Project ⁱ	4.427	16.839	1.271

**Table 36: Estimated GRZ and donor expenditures on maize extension, 1984-91
(financial values)(con't)**

ml. ZK

ITEM	1989	1990	1991
Eastern Province Ag. Dev. Project ^b	.459	.1244	.080
Oxen Supply Training Centre ^j	.1005	.5168	1.68
Ag. Res. and Development ^e	.0284	.03	.6
Agricultural Extension Services ^d	1.25		1.360
Staff Housing	.0345	.1082	.728
Valley Development	.2944		1.360
TOTAL MAIZE-RELATED EXPENDITURES	51.450	97.5	225.572

- ^a Based on actual expenditures reported in GRZ Financial Reports, 1984-91. 40 per cent of total expenditures in each category are attributed to maize extension, except where noted
- ^b Partially funded by SIDA and FINNIDA
- ^c Partially funded by NORAD
- ^d Partially funded by SIDA and NORAD
- ^e Partially funded by the Federal Republic of Germany
- ^f Partially funded by the United Kingdom
- ^g Partially funded by EEC; 100 % of expenditures attributed to maize
- ^h Partially funded by World Bank, IDA loan
- ⁱ Partially funded by IFAD, UK, GTZ, FINNIDA
- ^j Partially funded by Netherlands
- ^k 1991 data are total provisions for each category; actual expenditure data not available

**Table 36a: Estimated GRZ and donor expenditures on maize extension, 1984-91
(economic values)**

ml. ZK

ITEM	1984	1985	1986	1987	1988
Personal Emoluments ^a	5.559	6.049	8.989	6.455	8.502
Allowances ^a	.1264	.2035	.4134	.272	1.33
Purchase of Goods ^b	.8894	.3495	.377	.6788	2.112
Purchase of Services ^b	.2679	.167	.180	.2605	.7801
Training Expenses ^a	.1346	.2085	.350	.3236	.6724
CAPITAL EXPENDITURES ^c					
Lima Program	.4997	.1638	.161	.669	.7222
Village Agricultural Project, No.Prov.	.5982	.557	1.497	2.971	5.458
Motor Vehicles		.0534	.00341	.0267	.0047
Staff Housing			.0195	.2192	
Seed Control Institute			.322	.5034	
NAT'L FARMING INFORMATION SERVICE					
Personal Emoluments ^d	.1431	.1303	.2171	.1748	.3606
Recurrent Charges ^e	.00891	.0123	.0248	.0764	.1402
Purchase of Goods ^e	.0755	.0729	.0822	.2619	.4247
Purchase of Services ^e	.0094	.0109	.0159	.372	.6157
Office Equipment, Vehicles ^f		.0326	.0668	.2555	.1226
Rural Information Services ^e		.0107	.0383	.077	
Staff Housing ^f		.031	.02	.0948	
CAPITAL EXPENDITURES -- MAWD HEADQUARTERS ^g					
Integrated Rural Dev. Program (IRDP)	2.305	1.964	3.598	10.190	11.214
IRDP-NW Province	5.352	1.151	1.048	2.149	2.747
IRDP-Serenje, Mpika, Chinsali	.1083	.8552	1.563		.0015
Central Prov. Maize Production Project	.4574	.0873	.9494	2.025	3.455
So. Prov. Ag.Dev. Project	4.752	2.025	2.213		1.461
North-Western Area Dev. Project	.986	1.560	1.356	3.346	5.444

**Table 36a: Estimated GRZ and donor expenditures on maize extension, 1984-91
(economic values)(con't)**

ml. ZK

ITEM	1984	1985	1986	1987	1988
Eastern Province Ag. Dev. Project		5.125	5.479	2.864	1.48
Oxen Supply Training Centre		.00467	.0025	.00615	3.825
Ag. Res. and Development				.648	1.085
Agricultural Extension Services					.061
Staff Housing			.0146	.1275	.500
TOTAL MAIZE-RELATED EXPENDITURES	22.273	20.825	29	36.51	52.974

**Table 36a: Estimated GRZ and donor expenditures on maize extension, 1984-91
(economic values)(con't)**

ml. ZK

ITEM	1989	1990	1991
Personal Emoluments ^a	14.334	20.561	4.746
Allowances ^a	1.417	3.393	.731
Purchase of Goods ^b	2.967	7.233	1.173
Purchase of Services ^b	1.021	2.904	3.999
Training Expenses ^a	4.997	.8667	.1292
CAPITAL EXPENDITURES^c			
Lima Program	.517	1.303	.0732
Village Agricultural Project, No.Prov.	4.985	6.722	
Motor Vehicles, Movable Assets	.6123	4.046	7.818
Staff Housing			
Seed Control Institute			
NAT'L FARMING INFORMATION SERVICE			
Personal Emoluments ^d	.4023	1.188	3.715
Recurrent Charges ^e	.195	1.189	1.050
Purchase of Goods ^a	.5302	2.622	.9038
Purchase of Services ^a	.8169	2.356	9.049
Office Equipment, Vehicles ^f	.1946	1.045	1.419
Rural Information Services ^e	.0274	.0554	.0866
Staff Housing ^f	.1278	.2251	.257
CAPITAL EXPENDITURES -- MAWD HEADQUARTERS^g			
Integrated Rural Dev. Program (IRDP)	14.928	55.078	.659
IRDP-NW Province	2.263	12.637	2.883
IRDP-Serenje, Mpika, Chinsali			
Central Prov. Maize Production Project	3.333	9.999	352.454
So. Prov. Ag.Dev. Project	1.9	1.484	.1464
North-Western Area Dev. Project	6.468	34.365	2.326

**Table 36a: Estimated GRZ and donor expenditures on maize extension, 1984-91
(economic values)(con't)**

mln ZK

ITEM	1989	1990	1991
Eastern Province Ag. Dev. Project	.6706	.2539	.1464
Oxen Supply Training Centre	.1468	1.055	3.075
Ag. Res. and Development	.0415	.0612	1.098
Agricultural Extension Services	1.827		2.489
Staff Housing	.0504	.2208	1.333
Valley Development	.4301		2.489
TOTAL MAIZE-RELATED EXPENDITURES	65.203	170.861	404.25

- ^a No tradeable goods
- ^b 75% of expenditures are considered tradeable goods and valued at the SER
- ^c 85% of all expenditures in this category are considered tradeable goods and valued at the SER
- ^d No tradeable goods
- ^e 75% of expenditures are considered tradeable goods and valued at the SER
- ^f 85% of expenditures are considered tradeable goods and valued at the SER
- ^g 85% of all expenditures in this category are considered tradeable goods and valued at the SER

Appendix 8: Estimated GRZ and donor expenditures on maize marketing and related expenditures

Table 37: Estimated GRZ and donor expenditures on maize marketing and related expenditures, 1984-94^a (financial)

ml. ZK

ITEM	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Dept. of Cooperatives and Marketing											
Personal Emoluments	1.748	1.815	2.444	2.414	3.053	3.865	7.441	22.61			
Allowances	.0088	.245	.142	.118	.171	.185	1.645	.504			
Purchase of Goods	.0382	.067	.1635	.1802	.2676	.371	.5385	1.091			
Purchase of Services	.0421	.0655	.1724	.1715	.6005	.5375	.7467	.684			
Motor Vehicles, movable assets			1.249	.415		.05	.751	1.364			
Rural Storage Facilities				.506	.091	.09	.090	.251			
ECU Project ^b					.5						
TOTAL, est. Dept. of Coop/Mktg expenditures	1.837	1.972	4.170	3.804	4.683	5.098	11.21	26.5	48.69	48.69	
SUBSIDIES											
Fertilizer Handling ^c	6.56										
Fertilizer Price Differential Subsidy ^c	9.52			164.7	164.7	285.6	760				
Subsidies to Namboard	7										
Subsidies to Cooperative Unions	58.5	31.3				700	1304				
Milling Subsidy					770						
Seed Subsidy				9.7	478.3						
Coupon Program						600	1300				
TOTAL, est. subsidies ^d	81.6	134	565	638.4	1413	1586	3364	6983	6415	3207	0
TOTAL, Dept. of Coop/Mktg expenditures and subsidies	83.44	136	569.2	642.2	1418	1591	3375	7009	6463	3256	48.69

^a Based on actual expenditures reported in GRZ Financial Reports, 1984-91, and subsidy estimates in GRZ, 1990. 100 per cent of total expenditures in each category are attributed to maize marketing. 1991 estimates are provisional or estimates based on 1990 levels; actual expenditure data was not available. 1992 and 1993 estimates assume GRZ spending on subsidies declines to 50% and 25% of 1991 expenditures, respectively. Subsidy expenditures for the period 1994-2000 are assumed to decline to 0. Dept. of Coop/Mktg expenditures are assumed to remain constant at 1991 levels for the 1992-2000 period.

^b Partially funded by World Bank

^c 80% of total expenditures were attributed to maize

^d Subsidy category expenditures above do not add to this total, since complete information about breakdown of subsidy expenditures was not available for any year. Total estimated subsidies data are from GRZ, 1990

Table 37a: Estimated GRZ and donor expenditures on maize marketing and related expenditures, 1984-94 (economic)

ml. ZK

ITEM	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Dept. of Coop. and Marketing											
Personal Emoluments ^a	1.748	1.815	2.444	2.414	3.053	3.865	7.441	22.61			
Allowances ^a	.0088	.0245	.1415	.1176	.1708	.1846	1.645	.504			
Purchase of Goods ^b	.085	.077	.1287	.2292	.4145	.5219	1.033	1.89			
Purchase of Services ^b	.0938	.0752	.1357	.218	.930	.756	1.432	1.185			
Motor Vehicles, movable assets ^c			.947	.544		.073	1.532	2.497			
Rural Storage Facilities ^c				.662	.1476	.132	.1837	.4585			
ECU Project ^c					.811						
TOTAL, est. Dept. of Coop/Mkt. expend.	1.936	1.991	3.79	4.184	5.527	5.532	13.27	29.14	53.54	48.69	48.7
SUBSIDIES											
Fertilizer Handling	15.68			215.5	267.2	417.2	1551				
Fertilizer Price Differential Subsidy ^d											
Subsidies to Namboard	16.74										
Subsidies to Coop. Unions	139.9	36.57			1249	1023	2661				
Milling Subsidy ^d											
Seed Subsidy ^d											
Coupon Program ^d											
TOTAL, est. subsidies ^e	144	146.4	490	746.6	1897	1988	5290	10172	9883	4941	0
TOTAL, Dept. of Coop/Mkt. expend. and subsidies	146	148.4	493.8	750.8	1902	1993	5303	10201	9936	4990	48.7

^a No tradeable goods in this category

^b 75% of expenditures are considered tradeable goods and valued at the SER

^c 85% of expenditures are considered tradeable goods and valued at the SER

^d Not included in economic analysis

^e 55% of total estimated subsidies are included in the economic analysis. It is estimated that approximately 45% of subsidies are expenditures on coupons and other price differential categories, which are not included in economic analysis. Of this 55%, 85% of expenditures are considered to be tradeable items, and valued at the SER.

Appendix 9: Production costs

Table 38: Production costs per hectare (financial): small/medium farmer, local varieties, no oxen^{a,b}

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons ^c	0.83	0.56	1.00	0.88	1.24	1.03	1.43	1.74	0.81	1.73	1.55	1.29	1.52	0.25	1.42	1.42
VARIABLE COSTS																
Seed, 17 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basal fertilizer (Compound D), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Top Dressing (Am. Nitrate), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 78 person-days ^d	45.24	45.24	45.24	45.24	45.24	56.16	95.16	276.12	685.62	499.98	780.00	1170.0	1560.0	5578.38	11700.00	11700.00
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Packing ^e	3.83	2.59	4.62	4.06	5.73	5.97	13.99	49.32	57.03	88.91	90.42	243.67	202.67	143.28	1577.8	1577.78
Total Variable Cost	49.07	47.83	49.86	49.30	50.97	62.13	109.15	325.44	742.65	588.89	870.42	1413.7	1762.7	5721.66	13277.78	13277.78

^a Based on estimates of variable costs/ha for emergent (<10 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992.

^b Assumes that no fertilizer or pesticides are used on local varieties.

^c See Table 27.

^d For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (see Table 23) for each year. The labor requirement for non-oxen users is estimated at 89 days (ARPT, undated).

^e Based on per-bag costs reported for 1988, 1989, 1990, 1992 multiplied by the estimated yield for that season

Table 39: Production costs per hectare (economic), small/medium farmer, local varieties, no oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons	0.83	0.56	1.00	0.88	1.24	1.03	1.43	1.74	0.81	1.73	1.55	1.29	1.52	0.25	1.42	1.42
VARIABLE COSTS																
Seed, 17 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basal fertilizer (Compound D), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Top Dressing (Am. Nitrate), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 78 person-days	45.24	45.24	45.24	45.24	45.24	56.16	95.16	276.12	685.62	499.98	780.00	1170.00	1560.00	5578.38	11700.00	11700.00
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Packing*	12.13	8.26	14.84	13.35	19.72	15.55	31.15	56.11	44.74	113.08	140.08	342.77	388.78	248.28	2946.29	2946.29
Total Variable Cost	57.37	53.50	60.08	58.59	64.96	71.71	126.31	332.23	730.36	613.06	920.06	1512.77	1948.78	5826.66	14646.29	14646.29

* It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 40: Production costs per hectare (financial): small/medium farmer, local varieties, oxen^{a,b}

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons ^c	0.83	0.56	1.00	0.88	1.24	1.03	1.43	1.74	0.81	1.73	1.55	1.29	1.52	0.25	1.42	1.42
VARIABLE COSTS																
Seed, 17 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basal fertilizer (Compound D), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Top Dressing (Am. Nitrate), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 52 person-days ^d	30.16	30.16	30.16	30.16	30.16	37.44	63.44	184.08	457.08	333.32	520.00	780.00	1040.00	3718.92	7800.00	7800.00
Oxen hire/ha	10.66	10.66	10.66	10.66	10.66	13.38	22.57	65.42	162.50	118.61	200.00	450.00	637.24	550.00	1500.00	1500.00
Transport and Packing ^e	3.83	2.59	4.62	4.06	5.73	5.97	13.99	49.32	57.03	88.91	90.42	243.67	202.67	143.28	1577.78	1577.78
Total Variable Cost	44.65	43.41	45.44	44.88	46.55	56.79	100.00	298.82	676.61	540.83	810.42	1473.67	1879.91	4412.20	10877.78	10877.8

^a Based on estimates of variable costs/ha for emergent (<10 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992.

^b Assumes that no fertilizer, pesticides are used on local varieties.

^c See Table 27.

^d For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (Table 23) for each year. The labor requirement for oxen users is estimated at 61 person-days/ARPT, undated.

^e Based on per-bag costs reported for 1988, 1989, 1990, 1992 multiplied by the estimated yield for that season.

Table 41: Production costs per hectare (economic), small/medium farmer, local varieties, oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons	0.83	0.56	1.00	0.88	1.24	1.03	1.43	1.74	0.81	1.73	1.55	1.29	1.52	0.25	1.42	1.42
VARIABLE COSTS																
Seed, 17 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Basal fertilizer (Compound D), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Top Dressing (Am. Nitrate), 100 kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 52 person-days	30.16	30.16	30.16	30.16	30.16	37.44	63.44	184.08	457.08	333.32	520.00	780.00	1040.00	3718.92	7800.00	7800.00
Oxen hire/ha	10.66	10.66	10.66	10.66	10.66	13.38	22.57	65.42	162.50	118.61	200.00	450.00	637.24	550.00	1500.00	1500.00
Transport and Packing *	12.13	8.26	14.84	13.35	19.72	15.55	31.15	56.11	44.74	113.08	140.06	342.77	388.78	248.28	2946.29	2946.29
Total Variable Cost	52.95	49.08	55.66	54.17	60.54	66.36	117.16	305.61	664.31	565.00	860.06	1572.77	2066.02	4517.20	12246.29	12246.3

* It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 42: Production costs per hectare (financial): small/medium farmer, SR52 or non-Zambian hybrids, no oxen^a

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, non-Zambian hybrids ^b	1.36	0.91	1.64	1.44	2.04	1.69	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
Estimated yield, tons, SR-52 ^b	1.13	0.76	1.37	1.20	1.70	1.41	1.96	2.39	1.11	2.37	2.13	1.77	2.08	0.34	1.94	1.94
VARIABLE COSTS																
Seed, 17 kg ^c	10.58	10.58	10.58	10.58	10.58	13.27	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	2015.52	2015.52
Basal fertilizer (Compound D), 100 kg ^d	23.50	23.50	23.50	23.50	29.90	48.20	53.50	53.50	160.00	160.00	196.54	792.00	1134.00	1600.00	2939.61	2939.61
Top Dressing (Am. Nitrate), 100 kg ^d	20.16	20.16	20.16	20.16	28.16	46.40	51.70	51.70	112.00	112.00	128.00	766.00	868.00	1600.00	2939.61	2939.61
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days ^e	51.62	51.62	51.62	51.62	51.62	64.08	108.58	315.06	782.31	570.49	890.00	1335.00	1780.00	6365.08	13350.00	13350.00
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Packing ^f	5.75	3.86	6.95	6.10	8.64	8.98	21.08	74.40	85.90	133.61	136.50	367.39	304.67	214.92	2366.67	2366.67
Total Variable Cost	111.61	109.71	112.81	111.95	128.89	180.94	260.70	522.54	1183.05	1038.32	1459.16	3462.01	4464.07	10526.64	23611.41	23611.4

^a Based on estimates of variable costs/ha for emergent (<10 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992. See Table 27.

^b Assumes that the cost of SR-52 and non-Zambian hybrid seed is approximately equivalent to the cost of MM752

^c Source: ZCF, Fertilizer Selling Prices per Metric Tonne, 1981-91; 1978-81 estimated

^d For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (Table 23) for each year. The labor requirement for hybrid/non-oxen users is estimated at 89 days/ha (ARPT, undated).

^e Based on per-bag costs reported for 1988, 1989, 1990, 1992 multiplied by the estimated yield for that season

Table 43: Production costs per hectare (economic), small/medium farmer, SR52, no oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, SR-52	1.13	0.76	1.37	1.20	1.70	1.41	1.96	2.39	1.11	2.37	2.13	1.77	2.08	0.34	1.94	1.94
VARIABLE COSTS																
Seed, 17 kg	10.58	10.58	10.58	10.58	10.58	13.27	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	2015.52	2015.52
Basal fertilizer (Compound D), 100 kg ^a	65.18	65.10	66.89	74.54	82.18	94.87	117.19	143.30	182.18	230.86	377.42	785.82	2174.42	3845.09	7581.69	7581.69
Top Dressing (Am. Nitrate), 100 kg ^a	50.649	50.618	51.94	57.69	63.45	72.44	89.74	110.99	139.12	179.29	295.47	627.83	1724.69	3009.84	5935.97	5935.97
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days	51.62	51.62	51.62	51.62	51.62	64.08	108.58	315.06	782.31	570.49	890.00	1335.00	1780.00	6365.08	13350.0	13350.0
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Packing ^b	16.51	11.20	20.33	18.20	27.04	21.28	42.69	77.07	61.31	154.91	192.46	470.31	532.02	337.65	4025.21	4025.21
Total Variable Cost	194.54	189.12	201.35	212.62	234.86	265.94	384.04	674.30	1207.75	1197.77	1863.47	3420.58	6588.53	14304.3	32908.4	32908.4

^a See Table 25 for calculation of economic import parity price for fertilizer.

^b It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 44: Production costs per hectare (economic), small/medium farmer, non-Zambian hybrids, no oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, non-Zambian hybrids	1.36	0.91	1.64	1.44	2.04	1.69	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
VARIABLE COSTS																
Seed, 17 kg ^a	31.50	31.40	32.43	36.53	40.62	48.70	59.66	70.88	95.48	112.90	168.26	358.90	1122.57	1870.80	3683.12	3683.12
Basal fertilizer (Compound D), 100 kg ^b	65.18	65.10	66.89	74.54	82.18	94.87	117.19	143.30	182.18	230.86	377.42	785.82	2174.42	3845.09	7581.69	7581.69
Top Dressing (Am. Nitrate), 100 kg ^b	50.649	50.618	51.94	57.69	63.45	72.44	89.74	110.99	139.12	179.29	295.47	627.83	1724.69	3009.84	5935.97	5935.97
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days	51.62	51.62	51.62	51.62	51.62	64.08	108.58	315.06	782.31	570.49	890.00	1335.00	1780.00	6365.08	13350.00	13350.0
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Packing ^c	19.88	13.42	24.33	21.84	32.44	25.51	51.19	92.22	73.46	184.97	230.41	563.30	636.88	407.17	4813.66	4813.66
Total Variable Cost	218.82	212.15	227.20	242.21	270.31	305.60	426.36	732.46	1272.54	1278.52	1961.56	3670.86	7438.57	15497.98	35364.43	35364.4

^a See Table 26 for calculation of economic import parity price for imported seed.

^b See Table 25 for calculation of economic import parity price for fertilizer.

^c It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 45: Production costs per hectare (financial): small/medium farmer, SR52 or non-Zambian varieties, oxen^a

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94 -2001
Estimated yield, tons, non-Zambian hybrids ^b	1.36	0.91	1.64	1.44	2.04	1.69	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
Estimated yield, tons, SR-52 ^b	1.13	0.76	1.37	1.20	1.70	1.41	1.96	2.39	1.11	2.37	2.13	1.77	2.08	0.34	1.94	1.94
VARIABLE COSTS																
Seed, 17 kg ^c	10.58	10.58	10.58	10.58	10.58	13.27	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	2015.52	2015.52
Basal fertilizer (Compound D), 100 kg ^d	23.50	23.50	23.50	23.50	29.90	48.20	53.50	53.50	160.00	160.00	196.54	792.00	1134.00	1600.00	2939.61	2939.61
Top Dressing (Am. Nitrate), 100 kg ^d	20.16	20.16	20.16	20.16	28.16	46.40	51.70	51.70	112.00	112.00	128.00	766.00	868.00	1600.00	2939.61	2939.61
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days ^e	51.62	51.62	51.62	51.62	51.62	64.08	108.58	315.06	782.31	570.49	890.00	1335.00	1780.00	6365.08	13350.00	13350.00
Oxen hire/ha	10.66	10.66	10.66	10.66	10.66	13.38	22.57	65.42	162.50	118.61	200.00	450.00	637.24	550.00	1500.00	1500.00
Transport and Packing ^f	5.75	3.86	6.95	6.10	8.64	8.98	21.08	74.40	85.90	133.61	136.50	367.39	304.67	214.92	2366.67	2366.67
Total Variable Cost	122.27	120.37	123.47	122.61	139.55	194.31	283.27	587.98	1345.54	1156.93	1659.16	3912.01	5101.31	11076.64	25111.41	25111.4

^a Based on estimates of variable costs/ha for emergent (<10 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992.
^b See Table 27.

^c Assumes that the cost of SR-52 and non-Zambian hybrid seed is approximately equivalent to the cost of MM752

^d Source: ZCF, Fertilizer Selling Prices per Metric Tonne, 1981-91; 1978-81 estimated

^e For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (Table 23) for each year. The labor requirement for hybrid/oxen users is estimated at 61 person-days/ha.

^f Based on per-bag costs reported for 1988, 1989, 1990, 1992 * estimated yield for that season

Table 46: Production costs per hectare (economic), small/medium farmer, SR52, oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, SR-52	1.13	0.76	1.37	1.20	1.70	1.41	1.96	2.39	1.11	2.37	2.13	1.77	2.08	0.34	1.94	1.94
VARIABLE COSTS																
Seed, 17 kg	10.58	10.58	10.58	10.58	10.58	13.27	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	2015.52	2015.52
Basal fertilizer (Compound D), 100 kg ^a	65.18	65.10	66.89	74.54	82.18	94.87	117.19	143.30	182.18	230.86	377.42	785.82	2174.42	3845.09	7581.69	7581.69
Top Dressing (Am. Nitrate), 100 kg ^a	50.649	50.618	51.94	57.69	63.45	72.44	89.74	110.99	139.12	179.29	295.47	627.83	1724.69	3009.84	5935.97	5935.97
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days	51.62	51.62	51.62	51.62	51.62	64.08	108.58	315.06	782.31	570.49	890.00	1335.00	1780.00	6365.08	13350.00	13350.0
Oxen hire/ha	10.66	10.66	10.66	10.66	10.66	13.38	22.57	65.42	162.50	118.61	200.00	450.00	637.24	550.00	1500.00	1500.00
Transport and Packing ^b	16.51	11.20	20.33	18.20	27.04	21.28	42.69	77.07	61.31	154.91	192.46	470.31	532.02	337.65	4025.21	4025.21
Total Variable Cost	205.20	199.78	212.01	223.28	245.52	279.32	406.61	739.72	1370.25	1316.38	2063.47	3870.58	7225.77	14854.30	34408.39	34408.4

^a See Table 25 for calculation of economic import parity price for fertilizer.

^b It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 47: Production costs per hectare (economic), small/medium farmer, non- Zambian hybrids, oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94 -2001
Estimated yield, tons, non-Zambian hybrids	1.36	0.91	1.64	1.44	2.04	1.69	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
VARIABLE COSTS																
Seed, 17 kg ^a	31.50	31.40	32.43	36.53	40.62	48.70	59.66	70.88	95.48	112.90	168.26	358.90	1122.57	1870.80	3683.12	3683.12
Basal fertilizer (Compound D), 100 kg ^b	65.18	65.10	66.89	74.54	82.18	94.87	117.2	143.3	182.18	230.86	377.42	785.82	2174.42	3845.09	7581.69	7581.69
Top Dressing (Am. Nitrate), 100 kg ^b	50.65	50.62	51.94	57.69	63.45	72.44	89.74	110.9	139.12	179.29	295.47	627.83	1724.69	3009.84	5935.97	5935.97
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days	51.62	51.62	51.62	51.62	51.62	64.08	108.6	315.1	782.31	570.49	890.00	1335.00	1780.00	6365.08	13350.0	13350.0
Oxen hire/ha	10.66	10.66	10.66	10.66	10.66	13.38	22.57	65.42	162.50	118.61	200.00	450.00	637.24	550.00	1500.00	1500.00
Transport and Packing ^c	19.88	13.42	24.33	21.84	32.44	25.51	51.19	92.22	73.46	184.97	230.41	563.30	636.88	407.17	4813.66	4813.66
Total Variable Cost	229.5	222.8	237.9	252.9	280.9	318.9	448.9	797.9	1435.04	1397.13	2161.56	4120.86	8075.81	16047.9	36864.4	36864.4

^a See Table 26 for calculation of economic import parity price for imported seed.

^b See Table 25 for calculation of economic import parity price for fertilizer.

^c It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 48: Production costs per hectare (financial): small/medium farmer, Zambian improved varieties, no oxen^a

YEAR	78/79	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2 001
Estimated yield, tons, Zambian improved ^b	0.00	0.00	0.00	0.00	0.00	0.00	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
VARIABLE COSTS																
Seed (MM603/604/612/504), 17 kg ^c	0.00	0.00	0.00	0.00	0.00	0.00	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	561.0	561.0
Basal fertilizer (Compound D) 100 kg ^d	0.00	0.00	0.00	0.00	0.00	0.00	53.50	53.50	160.00	160.00	196.54	792.00	1134.0	1600.0	2939.6	2939.6
Top Dressing (Am. Nitrate) 100 kg ^d	0.00	0.00	0.00	0.00	0.00	0.00	51.70	51.70	112.00	112.00	128.00	766.00	868.00	1600.0	2939.6	2939.6
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days ^e	0.00	0.00	0.00	0.00	0.00	0.00	108.58	315.06	782.31	570.49	890.00	1335.0	1780.0	6365.1	13350	13350
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Packing ^f	0.00	0.00	0.00	0.00	0.00	0.00	22.98	81.06	93.64	145.43	148.75	400.44	332.00	234.98	2577.8	2577.8
Total Variable Cost	0.00	0.00	0.00	0.00	0.00	0.00	262.60	529.20	1190.8	1050.1	1471.4	3495.1	4491.4	10547	22368	22368

^a Based on estimates of variable costs/ha for emergent (<10 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992.
^b See Table 27.

^c Source: Zambia Seed Company. MM603/604/612/504 are the varieties most commonly adopted by small and medium-scale farmers.

^d Source: ZCF, Fertilizer Selling Prices per Metric Tonne, 1981-91; 1978-81 estimated

^e For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (Table 23) for each year. The labor requirement for hybrid/non-oxen users is estimated at 89 days/ha (ARPT, undated).

^f Based on per-bag costs reported for 1988, 1989, 1990, 1992 multiplied by the estimated yield for that season

Table 49: Production costs per hectare (economic), small/medium farmer, Zambian improved varieties, no oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94 -2001
Estimated yield, tons, Zambian improved	0	0	0	0	0	0	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
VARIABLE COSTS																
Seed (MM603/604/612/504), 17 kg	0.00	0.00	0.00	0.00	0.00	0.00	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	561.00	561.00
Basal fertilizer (Compound D), 100 kg ^a	0.00	0.00	0.00	0.00	0.00	0.00	117.19	143.30	182.18	230.86	377.42	785.82	2174.42	3845.09	7581.69	7581.69
Top Dressing (Am. Nitrate), 100 kg ^a	0.00	0.00	0.00	0.00	0.00	0.00	89.74	110.99	139.12	179.29	295.47	627.83	1724.69	3009.84	5935.97	5935.97
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 89 person-days	0.00	0.00	0.00	0.00	0.00	0.00	108.58	315.06	782.31	570.49	890.00	1335.00	1780.00	6365.08	13350.0	13350.0
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport and Packing ^b	0.00	0.00	0.00	0.00	0.00	0.00	51.19	92.22	73.46	184.97	230.41	563.30	636.88	407.17	4813.66	4813.66
Total Variable Cost	0.00	0.00	0.00	0.00	0.00	0.00	392.54	689.46	1219.91	1227.83	1901.42	3513.58	6693.40	14373.8	32242.3	32242.3

^a See Table 25 for calculation of economic import parity price for fertilizer.

^b It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 50: Production costs per hectare (financial): small/medium farmer, Zambian improved varieties, oxen^a

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, Zambian improved ^b	0	0	0	0	0	0	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
VARIABLE COSTS																
Seed (MM603/604/612/504), 17 kg ^c	0.00	0.00	0.00	0.00	0.00	0.00	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	561.00	561.00
Basal fertilizer (Compound D), 100 kg ^d	0.00	0.00	0.00	0.00	0.00	0.00	53.50	53.50	160.00	160.00	196.54	792.00	1134.00	1600.00	2939.61	2939.61
Top Dressing (Am. Nitrate), 100 kg ^d	0.00	0.00	0.00	0.00	0.00	0.00	51.70	51.70	112.00	112.00	128.00	766.00	868.00	1600.00	2939.61	2939.61
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 61 person-days ^e	0.00	0.00	0.00	0.00	0.00	0.00	74.42	215.94	536.19	391.01	610.00	915.00	1220.00	4362.58	9150.00	9150.00
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	22.57	65.42	162.50	118.61	200.00	450.00	637.24	550.00	1500.00	1500.00
Transport and Packing ^f	0.00	0.00	0.00	0.00	0.00	0.00	22.98	81.08	93.64	145.43	148.75	400.44	332.00	234.98	2577.78	2577.78
Total Variable Cost	0.00	0.00	0.00	0.00	0.00	0.00	251.02	495.50	1107.2	989.27	1391.41	3525.06	4568.64	9094.20	19668.00	19668.00

^a Based on estimates of variable costs/ha for emergent (<10 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992.

^b See Table 27.

^c Source: Zambia Seed Company. MM603/604/612/504 are the varieties most commonly adopted by small and medium-scale farmers

^d Source: ZCF, Fertilizer Selling Prices per Metric Tonne, 1981-91; 1978-81 estimated

^e For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (Table 23) for each year. The labor requirement for hybrid/oxen users is estimated at 61 person-days/ha (ARPT, undated).

^f Based on per-bag costs reported for 1988, 1989, 1990, 1992 multiplied by the estimated yield for that season.

Table 51: Production costs per hectare (economic), small/medium farmer, Zambian improved varieties, oxen

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, Zambian improved	0	0	0	0	0	0	2.35	2.86	1.33	2.83	2.55	2.12	2.49	0.41	2.32	2.32
VARIABLE COSTS																
Seed (MM603/604/612/504), 17 kg	0.00	0.00	0.00	0.00	0.00	0.00	25.84	27.88	42.84	62.22	108.12	201.62	377.40	746.64	561.00	561.00
Basal fertilizer (Compound D), 100 kg *	0.00	0.00	0.00	0.00	0.00	0.00	117.19	143.30	182.18	230.86	377.42	785.82	2174.42	3845.09	7581.69	7581.69
Top Dressing (Am. Nitrate), 100 kg*	0.00	0.00	0.00	0.00	0.00	0.00	89.74	110.99	139.12	179.29	295.47	627.83	1724.69	3009.84	5935.97	5935.97
Pesticide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor, 61 person-days	0.00	0.00	0.00	0.00	0.00	0.00	74.42	215.94	536.19	391.01	610.00	915.00	1220.00	4362.58	9150.00	9150.00
Oxen hire/ha	0.00	0.00	0.00	0.00	0.00	0.00	22.57	65.42	162.50	118.61	200.00	450.00	637.24	550.00	1500.00	1500.00
Transport and Packing ^b	0.00	0.00	0.00	0.00	0.00	0.00	51.19	92.22	73.46	184.97	230.41	563.30	636.88	407.17	4813.66	4813.66
Total Variable Cost	0.00	0.00	0.00	0.00	0.00	0.00	380.95	655.75	1136.28	1166.96	1821.42	3543.58	6770.64	12921.32	29542.31	29542.3

* See Table 25 for calculation of economic import parity price for fertilizer

^b It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table 23).

Table 52: Production costs per hectare (financial): large farmer, SR52 or non-Zambian hybrids

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, non-Zambian hybrids ^b	5.84	5.84	5.84	5.84	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.86	5.86	5.85	5.85	5.85
Estimated yield, tons, SR-52 ^b	5.43	5.43	5.43	5.43	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45
VARIABLE COSTS																
Seed, 25 kg ^c	15.56	15.56	15.56	15.56	15.56	19.52	38.00	41.00	63.00	91.50	159.00	296.50	555.00	1098.00	2964.00	2964.0
Basal fertilizer (Compound D), 400 kg ^d	94.00	94.00	94.00	94.00	119.60	192.80	214.00	214.00	640.00	640.00	786.16	3168.00	4536.00	6400.00	11758.4	11758
Top Dressing (Am. Nitrate), 300 kg ^d	60.48	60.48	60.48	60.48	84.48	139.20	155.10	155.10	336.00	336.00	384.00	2298.00	2604.00	4800.00	8818.83	8818.8
Herbicide	24.60	24.60	24.60	24.60	24.60	30.87	52.10	150.99	375.07	273.76	440.00	805.80	804.00	3053.11	6632.00	6632.0
Pesticide	6.56	6.56	6.56	6.56	6.56	8.23	13.89	40.25	99.97	72.97	207.00	225.00	39.99	813.78	378.00	378.00
Labor, 20 person-days ^e	11.60	11.60	11.60	11.60	11.60	14.40	24.40	70.80	175.80	128.20	200.00	300.00	400.00	1430.35	3000.00	3000.0
Insurance ^f	44.65	44.65	44.65	44.65	49.77	70.25	99.40	208.79	520.72	411.90	471.04	1631.67	2153.12	4634.22	7717.69	7717.7
YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Tractor hire ^g	171.07	171.07	171.07	171.07	171.07	214.68	362.28	1049.9	2608.1	1903.6	1750.0	7000.0	9800.0	21230.0	30100.0	30100
Combine hire	23.60	23.60	23.60	23.60	23.60	29.62	49.98	144.86	359.83	262.64	317.50	680.00	1411.08	2929.06	5000.00	5000.0
Transport and packing ^h	26.02	26.02	26.02	26.02	26.09	32.74	55.26	160.14	397.80	290.36	329.58	1068.17	754.00	3238.16	6277.78	6277.8
Total Variable Cost (excl. insurance)	433.5	433.5	433.5	433.5	483.2	682.1	965.0	2027.1	5055.5	3999.0	4573.2	15841.5	20904.1	44992.5	74929.1	74929
TVC plus insurance	478.15	478.15	478.15	478.15	532.93	752.32	1064.4	2235.9	5576.2	4410.9	5044.3	17473.1	23057.2	49626.7	82646.7	82646

^a Based on estimates of variable costs/ha for small commercial (10-50 ha), and large commercial (>50 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992.
^b See Table 27.

^c Source: Zambia Seed Company.

^d Source: ZCF, Fertilizer Selling Prices per Metric Tonne, 1981-91; 1978-81 estimated

^e For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (Table 23) for each year. The labor requirement for large farmers is estimated at 20 person-days (Farm Management Section, GRZ).

^f 10.3 % of variable cost (Farm Management Section, GRZ)

^a Tractor use by large farmers is estimated at 14 hours/ha (Farm Management Section, GRZ)
^b Based on per-bag costs reported for 1988, 1989, 1990, 1992 multiplied by the estimated yield for that season

Table 53: Production costs per hectare (economic), large farmer, SR52

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, SR-52	5.43	5.43	5.43	5.43	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45
VARIABLE COSTS																
Seed, 25 kg	15.56	15.56	15.56	15.56	15.56	19.52	38.00	41.00	63.00	91.50	159.00	296.50	555.00	1098.00	2964.00	2964.00
Basal fertilizer (Compound D), 400 kg ^a	260.70	260.38	267.55	298.14	328.73	379.47	468.74	573.20	728.71	923.45	1509.7	3143.28	8697.69	15380.4	30326.8	30326.8
Top Dressing (Am. Nitrate), 300 kg ^a	151.94	151.85	155.79	173.07	190.34	217.20	269.23	110.99	417.36	537.86	886.40	1883.50	5174.07	9029.51	17807.91	17807.9
Herbicide ^b	77.86	78.54	79.04	80.80	84.72	84.72	116.04	173.44	295.17	348.19	681.56	1133.52	1542.33	5290.37	12384.37	12384.4
Pesticide ^c	20.76	20.94	21.07	21.54	22.59	21.43	30.94	46.23	78.67	92.81	320.64	316.51	76.71	1410.10	705.86	705.86
Labor, 20 person-days	11.60	11.60	11.60	11.60	11.60	14.40	24.40	70.80	175.80	128.20	200.00	300.00	400.00	1430.35	3000.00	3000.00
Insurance	127.09	127.76	129.43	136.21	145.29	149.89	204.38	264.08	452.72	539.05	767.59	1990.46	5471.59	8334.09	14836.26	14836.3
Tractor hire ^d	541.37	546.12	549.58	561.82	589.10	559.10	806.89	1206.0	2052.5	2421.2	2710.8	9846.9	32575.6	36786.9	56207.7	56207.7
YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
Combine hire ^e	74.69	75.35	75.82	77.51	81.28	77.14	111.32	166.39	283.18	334.04	491.81	956.55	2706.90	5075.42	9336.83	2001
Transport and Packing ^f	79.36	80.06	80.56	82.36	86.67	82.26	118.72	175.74	301.01	356.22	492.45	1448.12	1393.98	5412.41	11307.94	11307.9
Total Variable Cost (excl. insurance)	1233.8	1240.4	1256.6	1322.4	1410.6	1455.2	1984.3	2563.8	4395.4	5233.4	7452.3	19324.9	53122.3	80913.5	144041.4	144041
TVC plus insurance	1360.9	1368.2	1385.9	1458.6	1555.9	1605.1	2188.6	2827.9	4848.1	5772.5	8219.9	21315.3	58593.8	89247.5	158877.7	158878

^a See Table 25 for calculation of economic import parity price for fertilizer

^b Assumed that import content is 75%; this proportion is adjusted by the SER (see Table 23).

^c Assumed that import content is 75%; this proportion is adjusted by the SER (see Table 23).

^d 75% of tractor hire costs are assumed to be imported goods and are valued at the SER.

^e 75% of combine hire costs are assumed to be imported goods and are valued at the SER.

^f It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (see Table we).

Table 54: Production costs per hectare (economic), large farmer, non-Zambian hybrids

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, non-Zambian hybrids	5.84	5.84	5.84	5.84	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.86	5.86	5.85	5.85	5.85
VARIABLE COSTS																
Seed, 25 kg ^a	46.33	46.18	47.69	53.72	59.74	71.62	87.74	104.24	140.41	166.04	247.44	527.80	1650.84	2751.18	5416.36	5416.36
Basal fertilizer (Compound D), 400 kg ^b	260.70	260.38	267.55	298.14	328.73	379.47	468.74	573.20	728.71	923.45	1509.7	3143.28	8697.69	15380.4	30326.76	30326.8
Top Dressing (Am. Nitrate), 300 kg ^b	151.95	151.85	155.79	173.07	190.34	217.20	269.23	110.99	417.36	537.86	886.40	1883.50	5174.07	9029.51	17807.91	17807.9
Herbicide ^c	77.86	78.54	79.04	80.80	84.72	84.72	116.04	173.44	295.17	348.19	681.56	1133.52	1542.33	5290.37	12384.37	12384.4
Pesticide ^d	20.76	20.94	21.07	21.54	22.59	21.43	30.94	46.23	78.67	92.81	320.64	316.51	76.71	1410.10	705.86	705.86
Labor, 20 person-days	11.60	11.60	11.60	11.60	11.60	14.40	24.40	70.80	175.80	128.20	200.00	300.00	400.00	1430.35	3000.00	3000.00
YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Insurance	130.87	131.54	133.36	140.78	150.50	155.88	210.40	271.92	462.97	549.42	780.42	2025.50	5595.26	8545.28	15174.34	15174.3
Tractor hire ^e	541.37	546.12	549.58	561.82	589.10	559.10	806.89	1206.0	2052.5	2421.2	2710.8	9846.88	32575.6	36786.9	56207.7	56207.7
Combine hire ^f	74.69	75.35	75.82	77.51	81.28	77.14	111.32	166.39	283.18	334.04	491.81	956.55	2706.90	5075.42	9336.83	9336.83
Transport and Packing ^g	85.35	86.10	86.64	88.58	93.04	88.30	127.43	188.64	323.10	382.37	528.60	1557.06	1498.85	5809.65	12137.88	12137.9
Total Variable Cost (excl. insurance)	1270.6	1277.1	1294.8	1366.8	1461.1	1513.4	2042.7	2639.9	4494.9	5334.1	7576.9	19665.1	54322.9	82963.9	147323.7	147324
TVC plus insurance	1401.1	1408.6	1428.1	1507.6	1611.6	1669.2	2253.1	2911.9	4957.9	5883.5	8357.3	21690.6	59918.2	91509.2	162498.0	162498

^a See Table 26 for calculation of economic import parity price for imported seed

^b See Table 25 for calculation of economic import parity price for fertilizer

^c Assumed that import content is 75%; this proportion is adjusted by the SER (see Table 23).

^d Assumed that import content is 75%; this proportion is adjusted by the SER (see Table 23).

^e 75% of tractor hire costs are assumed to be imported goods and are valued at the SER.

^f 75% of combine hire costs are assumed to be imported goods and are valued at the SER.

^g It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (See Table 23).

Table 55: Production costs per hectare (financial): large farmer, Zambian improved varieties

YEAR	78/79	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, Zambian improved ^a	0.00	0.00	0.00	0.00	0.00	0.00	6.54	6.54	6.05	6.06	6.07	6.17	6.14	6.09	6.09	6.09
VARIABLE COSTS																
Seed, 25 kg ^b	15.56	15.56	15.56	15.56	15.56	19.52	38.00	41.00	63.00	91.50	159.00	296.50	555.00	1098.00	2964.00	2964.00
Basal fertilizer (Compound D), 400 kg ^d	94.00	94.00	94.00	94.00	119.6	192.8	214.00	214.00	640.00	640.00	786.16	3168.00	4536.00	6400.00	11758.44	11758.4
Top Dressing (Am. Nitrate), 300 kg ^d	60.48	60.48	60.48	60.48	84.48	139.2	155.10	155.10	336.00	336.00	384.00	2298.00	2604.00	4800.00	8818.83	8818.83
Herbicide	24.60	24.60	24.60	24.60	24.60	30.87	52.10	150.99	375.07	273.76	440.00	805.80	804.00	3053.11	6632.00	6632.00
Pesticide	6.56	6.56	6.56	6.56	6.56	8.23	13.89	40.25	99.97	72.97	207.00	225.00	39.99	813.78	378.00	378.00
YEAR	78/79	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Labor, 20 person-days ^c	11.60	11.60	11.60	11.60	11.60	14.40	24.40	70.80	175.80	128.20	200.00	300.00	400.00	1430.35	3000.00	3000.00
Insurance ^e	41.97	41.97	41.97	41.97	47.08	66.88	100.29	211.39	523.62	414.07	473.57	1641.69	2159.78	4660.20	7768.05	7768.05
Tractor hire ^f	171.1	171.1	171.1	171.1	171.1	214.7	362.3	1049.9	2608.1	1903.6	1750.0	7000.0	9800.0	21230.00	30100.0	30100.0
Combine hire	23.60	23.60	23.60	23.60	23.60	29.62	49.98	144.86	359.83	262.64	317.50	680.00	1411.08	2929.06	5000.00	5000.00
Transport and Packing ^g	0.00	0.00	0.00	0.00	0.00	0.00	63.96	185.37	425.96	311.43	354.08	1165.44	818.67	3490.34	6766.67	6766.67
Total Variable Cost (excl. insurance)	407.5	407.5	407.5	407.5	457.1	649.3	973.7	2052.3	5083.7	4020.1	4597.7	15938.74	20968.73	45244.64	75417.94	75417.9
TVC plus insurance	449.4	449.4	449.4	449.4	504.2	716.2	1074.0	2263.7	5607.3	4434.2	5071.3	17580.44	23128.51	49904.84	83185.98	83185.9

^a Based on estimates of variable costs/ha for small commercial (10-50 ha), and large commercial (>50 ha) farmers by the Farm Management Section, Department of Agriculture, Lusaka, for 1988, 1989, 1990, 1992.
^b See Table 27.

^c Source: Zambia Seed Company.

^d Source: ZCF, Fertilizer Selling Prices per Metric Tonne, 1981-91; 1978-81 estimated

^e For years other than 1988, 1989, 1990, 1992, the casual labor daily rate is based on the average rate, adjusted according to nominal ZK/SDR exchange rates (Table 23) for each year. The labor requirement for large farmers is estimated at 20 person-days (Farm Management Section, GRZ).

^f 10.3 % of variable cost (Farm Management Section, GRZ)

^g Tractor use by large farmers is estimated at 14 hours/ha (Farm Management Section, GRZ)

^h Based on per-bag costs reported for 1988, 1989, 1990, 1992 multiplied by the estimated yield for that season

Table S6: Production costs per hectare (economic), large farmer, Zambian improved varieties

YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Estimated yield, tons, Zambian improved	0.00	0.00	0.00	0.00	0.00	0.00	6.54	6.54	6.05	6.06	6.07	6.17	6.14	6.09	6.09	6.09
VARIABLE COSTS																
Seed, 25 kg	0.00	0.00	0.00	0.00	0.00	0.00	38.00	41.00	63.00	91.50	159.00	296.50	555.00	1098.00	2964.00	2964.00
Basal fertilizer (Compound D), 400 kg*	0.00	0.00	0.00	0.00	0.00	0.00	468.74	573.20	728.71	923.45	1509.7	3143.28	8697.69	15380.37	30326.76	30326.8
Top Dressing (Am. Nitrate), 300 kg*	0.00	0.00	0.00	0.00	0.00	0.00	269.23	110.99	417.36	537.86	886.40	1883.50	5174.07	9029.51	17807.91	17807.9
Herbicide*	0.00	0.00	0.00	0.00	0.00	0.00	116.04	173.44	295.17	348.19	681.56	1133.52	1542.33	5290.37	12384.37	12384.4
Pesticide*	0.00	0.00	0.00	0.00	0.00	0.00	30.94	46.23	78.67	92.81	320.64	316.51	76.71	1410.10	705.86	705.86
Labor, 20 person-days	0.00	0.00	0.00	0.00	0.00	0.00	24.40	70.80	175.80	128.20	200.00	300.00	400.00	1430.35	3000.00	3000.00
YEAR	78/9	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94-2001
Insurance	0.00	0.00	0.00	0.00	0.00	0.00	206.83	267.70	456.14	543.15	773.36	2010.16	5489.77	8399.55	14973.04	14973.0
Tractor hire*	0.00	0.00	0.00	0.00	0.00	0.00	806.89	1206.1	2052.5	2421.2	2710.8	9846.9	32575.6	36786.93	56207.72	56207.7
Combine hire*	0.00	0.00	0.00	0.00	0.00	0.00	111.32	166.39	283.18	334.04	491.81	956.55	2706.90	5075.42	9336.83	9336.83
Transport and Packing†	0.00	0.00	0.00	0.00	0.00	0.00	142.46	210.89	334.15	396.09	548.48	1639.43	1570.47	6047.99	12635.84	12635.8
Total Variable Cost (excl. insurance)	0.00	0.00	0.00	0.00	0.00	0.00	2008.0	2598.9	4428.5	5273.3	7508.3	19516.16	53298.74	81549.04	145369.3	145369.
TVC plus insurance	0.00	0.00	0.00	0.00	0.00	0.00	2214.8	2866.7	4884.7	5816.5	8281.7	21526.33	58788.51	89948.60	160342.3	160342.

* See Table 25 for calculation of economic import parity price for fertilizer

b Assumed that import content is 75%, this proportion is adjusted by the SER (see Table 23).

c Assumed that import content is 75%, this proportion is adjusted by the SER (see Table 23).

d 75% of tractor hire costs are assumed to be imported goods and are valued at the SER.

e 75% of combine hire costs are assumed to be imported goods and are valued at the SER.

f It is assumed that 65% of the costs in this category are transport-related, and 35% are bagging costs. 75% of transport and bagging costs (jute bags are imported) are assumed to be imported goods, and are valued at the SER (See Table 23).

Appendix 10: Zamseed maize seed sales by province and variety, 1981-91

Table 57: Zamseed maize sales by province and variety, 1981-82^a

(50 KG BAGS) (% OF SALES IN PARENTHESES)

PROVINCE	SR52	ZH1	GRAND TOTAL
SOUTHERN	39338 (95.0)	2276 (5.0)	41614 24.0
EASTERN	7159 (42.0)	10013 (58.0)	17172 (10.0)
LUSAKA	40970 (87.0)	6130 (13.0)	47100 (27.0)
NORTHERN	8300 (100.0)		8300 (5.0)
LUAPULA	2330 (100.0)		2330 (1.0)
COPPERBELT	3884 (100.0)		3884 (2.0)
WESTERN	1897 (87.0)	278 (13.0)	2175 (1.0)
CENTRAL	36426 (80.0)	9195 (20.0)	45621 (26.0)
NORTHWEST	4911 (100.0)		4911 (3.0)
GRAND TOTAL	145215 (0.84)	27892 (16.0)	173107

^a Source: Zambia Seed Company, Ltd.

Table 58: Zamseed maize sales by province and variety, 1982-83*

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	SR52	ZH1	R215	GRAND TOTAL
SOUTHERN	41725 (87.0)	895 (2.0)	5300 (11.0)	47920 (31.0)
EASTERN	28188 (85.0)	955 (3.0)	4000 (12.0)	33143 (22.0)
LUSAKA	5249 (66.0)	739 (9.0)	1968 (25.0)	7956 (5.0)
NORTHERN	19960 (100.0)			19960 (13.0)
LUAPULA	1690 (100.0)			1690 (1.0)
COPPERBELT	3822 (85.0)	700 (15.0)		4522 (3.0)
WESTERN	2208 (82.0)		500 (18.0)	2708 (2.0)
CENTRAL	25281 (84.0)	3076 (10.0)	1800 (6.0)	30156 (20.0)
NORTHWEST	2636 (93.0)	200 (7.0)		2836 (2.0)
GRAND TOTAL	132720 (87.0)	6564 (4.0)	13568 (9.0)	152852
FINAL SALES TOTAL				167008

* Source: Zambia Seed Company, Ltd.

Table 59: Zamseed maize sales by province and variety, 1984-85^a

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	SR52	ZHI	MM752	CG4141	PNR473	OTHER	GRAND TOTAL
SOUTHERN	13980 (40.0)		801 (2.0)	15096 (43.0)	5119 (15.0)	1 (0.0)	34997 (21.0)
EASTERN	52429 (95.0)		1290 (2.0)		1390 (3.0)		55109 (33.0)
LUSAKA	10377 (62.0)	192 (1.0)	958 (6.0)	2406 (14.0)	2529 (15.0)	341 (2.0)	16803 (10.0)
NORTHERN	16200 (98.0)		350 (2.0)				16550 (10.0)
LUAPULA	2180 (99.0)		30 (1.0)				2210 (1.0)
COPPERBELT			154 (100)				154 (0.0)
WESTERN	1940 (68.0)		30 (1.0)	500 (17.0)	400 (14.0)		2870 (2.0)
CENTRAL	24651 (83.0)	772 (3.0)	2047 (7.0)	2298 (8.0)			29768 (18.0)
NORTHWEST	3256 (94.0)		110 (3.0)		115 (3.0)		3481 (2.0)
STOCKISTS	2303 (73.0)		154 (5.0)	358 (11.0)	341 (11.0)		3156 (2.0)
GRAND TOTAL	127316 (77.0)	965 (1.0)	5924 (4.0)	20657 (13.0)	9893 (6.0)	342 (0.0)	165097
FINAL SALES TOTAL							137793

^a Source: Zambia Seed Company, Ltd. Detailed sales information was not available for 1982-83.

Note: MM752 was released in 1983 and sold through Zamseed beginning in the 1984-85 season. However, no sales data for MM752 is available in the records. Data for SR52 and MM752 sales may have been mixed for this season.

Table 60: Zamseed maize sales by province and variety, 1985-86^a

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	SR52	ZH1	CG4141	OTHER	MM752	MM501	MM502
SOUTHERN	235 (1.0)		20 (0.0)	70 (0.0)	14780 (56.0)	53 (0.0)	20 (0.0)
EASTERN	7011 (21.0)				22446 (66.0)		
LUSAKA	3550 (17.0)	391 (2.0)	87 (0.0)	357 (2.0)	10637 (51.0)	8 (0.0)	139 (1.0)
NORTHERN	490 (2.0)				13284 (63.0)		
LUAPULA							
COPPERBELT	793 (17.0)	1 (0.0)			3971 (83.0)		
WESTERN				110 (2.0)	1101 (23.0)	115 (2.0)	99 (2.0)
CENTRAL	234 (1.0)	20 (0.0)		523 (2.0)	25257 (79.0)		
NORTHWEST	970 (52.0)				92 (5.0)		
GRAND TOTAL	13283 (9.0)	412 (0.0)	107 (0.0)	1060 (1.0)	91568 (62.0)	176 (0.0)	258 (0.0)

Table 60: Zamseed maize sales by province and variety, 1985-86* (con't)

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MM504	MM601	MM603	MM604	MMV400	MMV600	GRAND TOTAL
SOUTHERN	444 (2.0)	1397 (5.0)	5667 (21.0)	3303 (12.0)	507 (2.0)		26496 (18.0)
EASTERN	4 (0.0)	40 (0.0)	2268 (7.0)	2123 (6.0)			33892 (23.0)
LUSAKA	771 (4.0)	3069 (15.0)	1661 (8.0)	110 (1.0)	69 (0.0)	14 (0.0)	20863 (14.0)
NORTHERN				7292 (35.0)			21066 (14.0)
LUAPULA			46 (4.0)	660 (62.0)		365 (34.0)	1071 (1.0)
COPPERBELT	10 (0.0)		10 (0.0)				4785 (3.0)
WESTERN	630 (13.0)		2255 (47.0)	500 (10.0)			4810 (3.0)
CENTRAL	370 (1.0)	144 (0.0)	1634 (5.0)	3757 (12.0)			31939 (22.0)
NORTHWEST			2 (0.0)		1 (0.0)	800 (43.0)	1865 (1.0)
GRAND TOTAL	2229 (2.0)	4650 (3.0)	13543 (9.0)	17745 (12.0)	577 (0.0)	1179 (1.0)	146787
FINAL SALES TOTAL							146091

* Source: Zambia Seed Company, Ltd.

Table 61: Zamseed maize sales by province and variety, 1986-87*

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	SR52	ZH1	CG4141	OTHER	MM752	MM501	MM502
SOUTHERN	30 (0.0)				4035 (9.0)	1 (0.0)	1548 (4.0)
EASTERN	163.2 (1.0)				462 (2.0)		
LUSAKA	1843 (6.0)	194 (1.0)	12 (0.0)		6434 (22.0)	10 (0.0)	209 (1.0)
NORTHERN					4553 (31.0)		
LUAPULA	4 (0.0)				44 (1.0)		
COPPERBELT	3 (0.0)				2488 (29.0)		
WESTERN					200 (3.0)		
CENTRAL					8181 (21.0)		70 (0.0)
NORTHWEST					317 (13.0)		
OTHER	1231 (2.0)				2337 (37.0)		
SERIOES					2170 (51.0)		5 (0.0)
GRAND TOTAL	3275 (2.0)	194 (0.0)	12 (0.0)		31221 (18.0)	11 (0.0)	1832 (1.0)

Table 61: Zamseed maize sales by province and variety, 1986-87* (con't)

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MM504	MM601	MM603	MM604	MMV400	MMV600	GRAND TOTAL
SOUTHERN	9146 (21.0)	2278 (6.0)	14120 (33.0)	9693 (23.0)	1913 (4.0)	307 (1.0)	43071 (24.0)
EASTERN			6727 (31.0)	14286 (66.0)		59 (0.0)	21697 (12.0)
LUSAKA	2157 (8.0)	2046 (7.0)	9268 (32.0)	2894 (10.0)	495 (2.0)	3078 (11.0)	28640 (16.0)
NORTHERN			110 (1.0)	6450 (44.0)		3602 (24.0)	14715 (8.0)
LUAPULA		10 (0.0)	1685 (57.0)	8 (0.0)		1222 (41.0)	2973 (2.0)
COPPERBELT	310 (4.0)	485 (6.0)	3107 (36.0)	1838 (21.0)	15 (0.0)	394 (5.0)	8641 (5.0)
WESTERN	1822 (3.0)		3013 (50.0)	100 (2.0)	872 (15.0)		6006 (3.0)
CENTRAL	8111.2 (21.0)	881 (2.0)	5609 (14.0)	13484 (34.0)		2822 (7.0)	39157 (22.0)
NORTHWEST			316 (13.0)	80 (3.0)		1644 (70.0)	2357 (1.0)
OTHER			579 (9.0)	1926 (31.0)			6254 (4.0)
SERIOES		601 (14.0)	890 (21.0)	600 (14.0)		180 (3.0)	4266 (2.0)
GRAND TOTAL	21546 (12.0)	6301 (4.0)	45424 (26.0)	51358 (29.0)	3295 (2.0)	13309 (7.0)	177779
FINAL SALES TOTAL							177386

* Source: Zambia Seed Company, Ltd.

Table 62: Zamseed maize sales by province and variety, 1987-88^a

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MM752	MM601	MM603	MM604	MM502	MM504	R215	R201	ZS225	GRAND TOTAL
SOUTHERN	2015 (5.0)	431 (1.0)	2241 (5.0)		272 (1.0)	33 (0.0)	21479 (48.0)	17272 (39.0)	880 (2.0)	44623 (24.0)
EASTERN	4022 (13.0)		1 (0.0)	18403 (59.0)	400 (1.0)		3949 (13.0)		4600 (15.0)	31375 (17.0)
LUSAKA	375 (3.0)	125 (1.0)	2883 (22.0)	214 (2.0)	60 (0.0)		4607 (35.0)	1976 (15.0)	2790 (21.0)	13030 (7.0)
NORTHERN	4952 (22.0)	2 (0.0)	11277 (49.0)	1407 (6.0)			5256 (23.0)	14 (0.0)		22908 (12.0)
LUAPULA	450 (10.0)	25 (1.0)	2400 (54.0)				1600 (36.0)			4475 (2.0)
COPPERBELT	2378 (24.0)	1263 (13.0)	770 (8.0)	4 (0.0)			5118 (51.0)	1 (0.0)	443 (4.0)	9977 (5.0)
WESTERN	500 (5.0)		5868 (58.0)				1900 (19.0)	1900 (19.0)		10168 (5.0)
CENTRAL	7481 (19.0)	240 (1.0)	5016 (12.0)	184 (0.0)		5 (0.0)	15041 (37.0)	7073 (18.0)	5141 (13.0)	40181 (21.0)
NORTHWEST	1076 (35.0)		181 (6.0)				1740 (57.0)	60 (0.02)		3057 (2.0)
RETAIL	1788 (19.0)	912 (10.0)	925 (10.0)	132 (1.0)	276 (3.0)		3176 (34.0)	1378 (15.0)	658 (7.0)	9245 (5.0)
GRAND TOTAL	25037 (13.0)	2998 (2.0)	31562 (17.0)	20344 (11.0)	1008 (1.0)	38 (0.0)	63866 (34.0)	29660 (16.0)	14526 (8.0)	189039
FINAL SALES TOTAL										208088

^a Source: Zambia Seed Company, Ltd.

Table 63: Zamseed maize sales by province and variety, 1988-89*

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MM752 MM612	MM601 MM502 MM501	MM603 MM604	R201 R215	MMV400	MMV600	MM504	ZS206	GRAND TOTAL
SOUTHERN	2508 (6.0)	611 (1.0)	13697 (32.0)	19631 (46.0)	3666 (8.0)	3222 (7.0)			43335 (16.0)
EASTERN	8912 (24.0)		27947 (75.0)		400 (1.0)				37259 (14.0)
LUSAKA	1199 (9.0)		8479 (61.0)	3101 (22.0)	1000 (7.0)	200 (1.0)			13979 (5.0)
NORTHERN	6638 (21.0)		25287 (79.0)						31925 (12.0)
LUAPULA	516 (7.0)	57 (1.0)	4572 (64.0)			2020 (28.0)			7165 (3.0)
COPPERBELT	1042 (6.0)	3731 (22.0)	12439 (72.0)						17212 (6.0)
WESTERN			5530 (68.0)		1440 (18.0)		1200 (15.0)		8170 (3.0)
CENTRAL	16634 (29.0)	5030 (9.0)	10323 (18.0)	21127 (37.0)		2228 (4.0)	1785 (3.0)	298 (1.0)	57425 (21.0)
NORTHWEST	2363 (32.0)		1400 (19.0)			3593 (49.0)			7356 (3.0)
OTHER									31264 (12.0)
RETAIL									15765 (6.0)
GRAND TOTAL	39812 (15.0)	9429 (4.0)	109674 (41.0)	43859 (16.0)	6106 (2.0)	11663 (4.0)	2985 (1.0)	298 (0.0)	270854
FINAL SALES TOTAL									272093

* Source: Zambia Seed Company, Ltd.

Table 64: Zamseed maize sales by province and variety, 1989-90*

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MM752	MM601	MM603	MM604	MM612	MM502	MM504
SOUTHERN	1320 (3.0)		16558 (38.0)				
EASTERN	4451 (13.0)		2310 (7.0)	23691 (67.0)			
LUSAKA	2320 (12.0)		3060 (16.0)	1820 (9.0)			1000 (5.0)
NORTHERN	3610 (11.0)		11504 (34.0)	12023 (36.0)	6511 (19.0)		
LUAPULA	700 (8.0)		6690 (73.0)	600 (7.0)			
COPPERBELT	3403 (37.0)	800 (9.0)	1989 (21.0)	3106 (33.0)			
WESTERN			5209 (37.0)	3451 (24.0)			600 (4.0)
CENTRAL	16406 (26.0)		9136 (14.0)	20291 (32.0)	2250 (4.0)	200 (0.0)	2972 (5.0)
NORTHWEST	3384 (41.0)		299 (4.0)		1700 (20.0)		
OTHER	1835 (7.0)	731 (3.0)	6974 (27.0)	2846 (11.0)	8 (0.0)	457 (2.0)	128 (1.0)
GRAND TOTAL	37429 (14.0)	1531 (1.0)	63729 (24.0)	67828 (26.0)	10469 (4.0)	657 (0.0)	4700 (2.0)

Table 64: Zamseed maize sales by province and variety, 1989-90* (con't)

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MMV400	MMV600	ZS206	R215	R201	GRAND TOTAL
SOUTHERN	2100 (5.0)			8208 (19.0)	15080 (35.0)	43266 (17.0)
EASTERN		810 (2.0)		2505 (7.0)	1470 (4.0)	35237 (13.0)
LUSAKA	400 (2.0)	600 (3.0)		8550 (43.0)	1950 (10.0)	19700 (8.0)
NORTHERN						33648 (13.0)
LUAPULA		1160 (13.0)				9150 (3.0)
COPPERBELT						9298 (4.0)
WESTERN				4840 (34.0)		14100 (5.0)
CENTRAL				10510 (17.0)	1540 (2.0)	63305 (24.0)
NORTHWEST	1 (0.0)	2910 (35.0)				8294 (3.0)
OTHER	96 (0.0)	1580 (6.0)	4189 (16.0)	6433 (25.0)	195 (1.0)	25472 (10.0)
GRAND TOTAL	2597 (1.0)	7060 (3.0)	4189 (2.0)	41046 (16.0)	20235 (8.0)	261470
FINAL SALES TOTAL						300000

* Source: Zambia Seed Company, Ltd. Detailed data for 1988 were not available.

Table 65: Zamseed maize sales by province and variety, 1990-91^a

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MM752	MM601	MM603	MM604	MM612	MM502	MM504
SOUTHERN	1514 (3.0)	1257 (3.0)	16475 (38.0)	23082 (53.0)		177 (0.0)	22 (0.0)
EASTERN	15260 (38.0)		973 (2.0)	23755 (59.0)	1 (0.0)		
LUSAKA	2196 (9.0)	888 (4.0)	5644 (24.0)	4280 (18.0)	8 (0.0)	1013 (4.0)	8 (0.0)
NORTHERN			92 (15.0)	100 (17.0)	403 (68.0)		
LUAPULA	444 (9.0)		3200 (65.0)	496 (10.0)	700 (14.0)		
COPPERBELT	143 (4.0)	56 (1.0)	2173 (57.0)	1046 (27.0)			
WESTERN			5901 (88.0)	220 (3.0)			
CENTRAL	14884 (46.0)	175 (1.0)	2118 (7.0)	13634 (42.0)	245 (1.0)	10 (0.0)	
NORTHWEST	1 (2.0)		2 (4.0)	52 (85.0)	6 (9.0)		
GRAND TOTAL	34442 (22.0)	2377 (2.0)	36580 (23.0)	66665 (43.0)	1363 (1.0)	1200 (1.0)	30 (0.0)

Table 65: Zamseed maize sales by province and variety, 1990-91* (con't)

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MMV400	MMV600	ZS206	R215	R201	ZS225	GRAND TOTAL
SOUTHERN	386 (1.0)	13 (0.0)	379 (1.0)	383 (1.0)	158 (0.0)		43847 (28.0)
EASTERN	0.8 (0.0)	41.8 (0.0)		40 (0.0)			40072 (26.0)
LUSAKA	326 (1.0)	5614 (24.0)	2635 (11.0)	643 (3.0)	24 (0.0)	121 (1.0)	23401 (15.0)
NORTHERN							595 (0.0)
LUAPULA			100 (2.0)				4940 (3.0)
COPPERBELT	5 (0.0)		420 (11.0)		5 (0.0)		3845 (2.0)
WESTERN	560 (8.0)						6681 (4.0)
CENTRAL			1100 (3.0)	56 (0.0)			32221 (21.0)
NORTHWEST							61.2 (0.0)
GRAND TOTAL	1274 (1.0)	5669 (4.0)	4634 (3.0)	1123 (1.0)	187 (0.0)	121 (0.0)	155662
FINAL SALES TOTAL							143633

* Source: Zambia Seed Company, Ltd.

Table 66: Zamseed maize sales by province and variety, 1991-92*

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MM752	MM601	MM603	MM604	MM612	MM501	MM502	MM504
SOUTHERN	987 (2.0)	1407 (3.0)	12076 (26.0)	26805 (58.0)		20 (0.0)	69 (0.0)	610 (1.0)
EASTERN	1198 (4.0)	4600 (14.0)	14000 (43.0)	9000 (27.0)			2800 (9.0)	
LUSAKA	692 (5.0)	174 (1.0)	6804 (54.0)	2641 (21.0)				20 (0.0)
NORTHERN	2139 (20.0)		1806 (17.0)	1608 (15.0)	4890 (47.0)			
LUAPULA	7 (0.0)		1114 (52.0)	4 (0.0)	1000 (47.0)			
COPPERBELT	1515 (21.0)	208 (3.0)	3167 (43.0)	2001 (27.0)	4 (0.0)			
WESTERN		4 (0.0)	1965 (73.0)	530 (20.0)				
CENTRAL	949 (4.0)	408 (2.0)	8032 (32.0)	10103 (40.0)	3816 (15.0)			
NORTHWEST	150 (8.0)		700 (37.0)	250 (13.0)	200 (11.0)			
RETAIL	202 (4.0)	80 (2.0)	1867 (38.0)	2051 (42.0)	680 (14.0)			
GRAND TOTAL	7839 (5.0)	6881 (5.0)	51531 (35.0)	54993 (38.0)	10590 (7.0)	20 (0.0)	2869 (2.0)	630 (0.0)

* Source: Zambia Seed Company, Ltd.

Table 66: Zamseed maize sales by province and variety, 1991-92* (con't)

(50 KG BAGS)(% OF SALES IN PARENTHESES)

PROVINCE	MMV400	MMV600	ZS206	R215	R201	ZS225	BULK	GRAND TOTAL
SOUTHERN	1695 (4.0)		391 (1.0)	1787 (4.0)	289 (1.0)			46136 (32.0)
EASTERN	11 (0.0)	11 (0.0)					1148 (4.0)	32768 (22.0)
LUSAKA	379 (3.0)	366 (3.0)	1125 (9.0)	373 (3.0)	54 (0.0)			12628 (9.0)
NORTHERN								10443 (7.0)
LUAPULA								2125 (1.0)
COPPERBELT		13 (0.0)	377 (5.0)					7285 (5.0)
WESTERN	204 (8.0)							2703 (2.0)
CENTRAL	19 (0.0)		1965 (8.0)	57 (0.0)				25350 (17.0)
NORTHWEST		584 (31.0)						1884 (1.0)
RETAIL								4879 (3.0)
GRAND TOTAL	2308 (2.0)	974 (1.0)	3858 (3.0)	2217 (2.0)	343 (0.0)		1148 (1.0)	146200
FINAL SALES TOTAL								199864

* Source: Zambia Seed Company, Ltd.

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- RP 29. *Agricultural Development and Policy in Senegal: Annotated Bibliography of Recent Studies, 1983-89* by Eric W. Crawford, R. James Bingen, and Malcolm Versel. 1990. 254 pp. (CDIE reference PN-ABE-271)
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