

HIGH YIELDS AND PROFITS DEMONSTRATED IN ZOWA AFRICAN PURCHASE LAND

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Zowa A.P.L. lies some 80 km south of Sinoia, where most of the area is classified in the Agro-ecological Survey of Rhodesia as being suitable for intensive crop production supported by livestock. The south-western portion is regarded as being suited mainly to livestock production with some cropping. Despite the suitability of the area for intensive crop production many farmers, in common with those in other A.P.L.s, have persistently grown large areas of poorly managed crops. Common practices include late planting, inadequate plant populations and insufficient fertilizer. This almost traditional method of farming is the opposite to that advocated by the extension service which recommends smaller areas of well chosen crops and careful management, thereby releasing more land for grazing and ensuring that only the best land is cropped on each farm.

To demonstrate that this policy makes sense—both financially and from a land-use point of view—one hectare of land was selected about 350 metres from the homestead on Farm 69. This was a typical piece of land—a moderately deep, well-drained sand derived from granite on a fairly gentle slope originally covered in mSasa and mufuti woodland. From 1966 to 1974 the area was cropped continuously with cotton and maize, each on 0,4 hectare every year and 0,2 hectare ground-nuts or rapoko in alternate years. In 1973-74 the last year of the demonstration, cotton and maize were main-

tained at 0,4 hectare each while ground-nuts and rapoko were both grown on the remaining 0,2 hectare.

Throughout the period cropping practices conformed to standard recommendations for the area. To start with, the maize variety SR52 was grown and later, R200. Albar cotton was chosen and whichever variety of rapoko or ground-nut seed as could be obtained locally. For maize and cotton a standard fertilizer application of 330 kg per hectare of Compound L was applied, followed by one top-dressing or more, depending upon season, of ammonium nitrate totalling 120 kg per hectare. Other than a top-dressing of gypsum, fertilizer was not applied to the ground-nuts. Rapoko received only token quantities of fertilizer and, in some years, not even that.

The only radical departures from standard recommended practices were that soil from an ant-heap was spread over the area in 1966, and throughout the eight years over which the demonstration was run, all crops were grown on ridges parallel to the contour banks. These ridges were up to 230 mm high, averaging about 180 mm. It is believed that this practice contributed materially to the success of the demonstration.

Yields obtained in each of the eight years of the trial are shown in Table 1, which also shows average yields obtained in Zowa A.P.L. and seasonal rainfall totals. It will be seen that, for the six years for which both figures are available, the average yield of maize was about three

TABLE 1

Yields obtained in trial compared with Zowa A.P.L. averages

Year	Rainfall	Crop yields per hectare							
		Maize (bags) <i>91kg</i>		Cotton (kg)		Ground-nuts (bags) <i>82 shells* 40 unshel</i>		Rapoko (bags) <i>91kg</i>	
		Zowa	Trial	Zowa	Trial	Zowa	Trial	Zowa	Trial
1966-67	725	Not known	55	Not known	1 597	Not known	None		5
1967-68	567	known	62	known	1 696	known	7	Not known	None
1968-69	988	20	66	1 068	1 995	6	6	known	None
1969-70	683	8	66	575	1 607	1	None		8
1970-71	702	18	73	918	1 795	8	9		None
1971-72	878	29	66	1 051	1 800	3	None		4
1972-73	619	2	Nil	485	1 397	Nil	Nil		None
1973-74	1 054	27	48	767	2 334	4	19		35
Average (six years)	821	17 <i>1547</i>	53	811	1 821	4 <i>328*</i>	9		16
Highest	1 054	29 <i>1639</i>	73	1 068	2 334	8 <i>656*</i>	19		35
Lowest	619	2 <i>182</i>	Nil	485	1 397	Nil	Nil		4

Note.—In above table "Nil" means crop grown—no yield, or yield less than one bag per ha.
"None" means crop not grown.
"Not known" means information not collected.



Plate 1.—Good ploughing is essential for success.

times the Zowa average, and about double the average for cotton and ground-nuts. In the last year of the trial rapoko was sown in a seed-bed and planted by hand.

In the severe drought of 1972–73 the maize crop was a total failure on the demonstration, whereas the average yield in the Purchase Land was 224 kg/ha. This suggests that, compared with modern methods used by farmers in the cash economy, traditional methods of growing maize are better adapted to ensuring the availability of the small quantities required for subsistence in bad seasons. Thus, any programme to improve maize yields in African areas, especially in marginal rainfall country, must include advice to store maize or hold cash against a bad season.

Cotton yields were consistently well above average for the area and, in the drought of 1972–73, the demonstration yield was about three times the area average, as it was again in the following wet year. Part of this success is attributed to the fact that the crop was grown on ridges which could be tied to retain whatever rain fell in 1972–73, and enabled the excessive rain of 1973–74 to get away.

In addition to yields, costs and returns were recorded. Table 2 shows these, together with the gross margins obtained on the total area cropped.



Plate 2.—Only correct and regular scouting can produce high-yielding crops.

TABLE 2

Costs and returns from one hectare of cropping
(0,4 ha cotton; 0,4 ha maize; 0,2 ha ground-nuts or rapoko)

Season and crop	Total costs	Total returns	Gross margin	Total gross margin from one hectare
	\$	\$	\$	\$
1966–67 Cotton	41,85	90,00	48,15	110,36
Maize	23,10	80,00	56,90	
Rapoko	6,69	12,00	5,31	
1967–68 Cotton	43,85	102,85	59,00	147,16
Maize	27,20	84,00	56,80	
Ground-nuts	5,49	5,60	0,11	
1968–69 Cotton	51,30	136,00	84,70	326,85
Maize	31,05	93,00	61,95	
Ground-nuts	5,49	6,00	0,51	
1969–70 Cotton	42,98	99,00	56,02	133,86
Maize	27,41	93,00	65,59	
Rapoko	5,75	18,00	12,25	
1970–71 Cotton	53,52	130,56	77,04	166,10
Maize	35,75	123,75	88,00	
Ground-nuts	6,94	8,00	1,06	
1971–72 Cotton	50,40	316,00	265,60	67,40
Maize	36,25	96,00	59,75	
Rapoko	4,50	6,00	1,50	
1972–73 Cotton	54,40	155,00	100,60	24,00
Maize	28,00	Nil	-28,00	
Ground-nuts	5,20	Nil	-5,20	
1973–74 Cotton	71,90	230,48	158,58	340,18
Maize	40,50	160,60	120,10	
Ground-nuts	8,00	32,00	24,00	
Rapoko	10,50	48,00	37,50	

Other studies by members of the Department of Conservation and Extension suggest that an average A.P.L. family employing one labourer can handle a total of three hectares of cropping made up of 1,50 hectares cotton, 1,00 hectare maize, and 0,25 hectare each of ground-nuts and rapoko. Using average yields obtained over the last six years of this trial, such an area should produce annually 2 700 kg cotton, 53 bags maize, two bags ground-nuts and four bags of rapoko. Assuming that 14 bags maize, and all the rapoko and ground-nuts were retained for home consumption, the total value of sales would be approximately \$890 at 1974 prices. Costs for such programme would amount to \$346 leaving an annual margin of \$544 from three hectares of crops.

Conclusion

It has been shown that, from only moderate applications of fertilizer, very high yields are possible in Zowa A.P.L. However, even these amounts require considerable expenditure of risk capital which farmers generally do not possess. To achieve success farmers will have to commit themselves to a cash economy. They, and the money-lenders, will have to learn to accept the risks involved and manage both their finances and their cropping accordingly.