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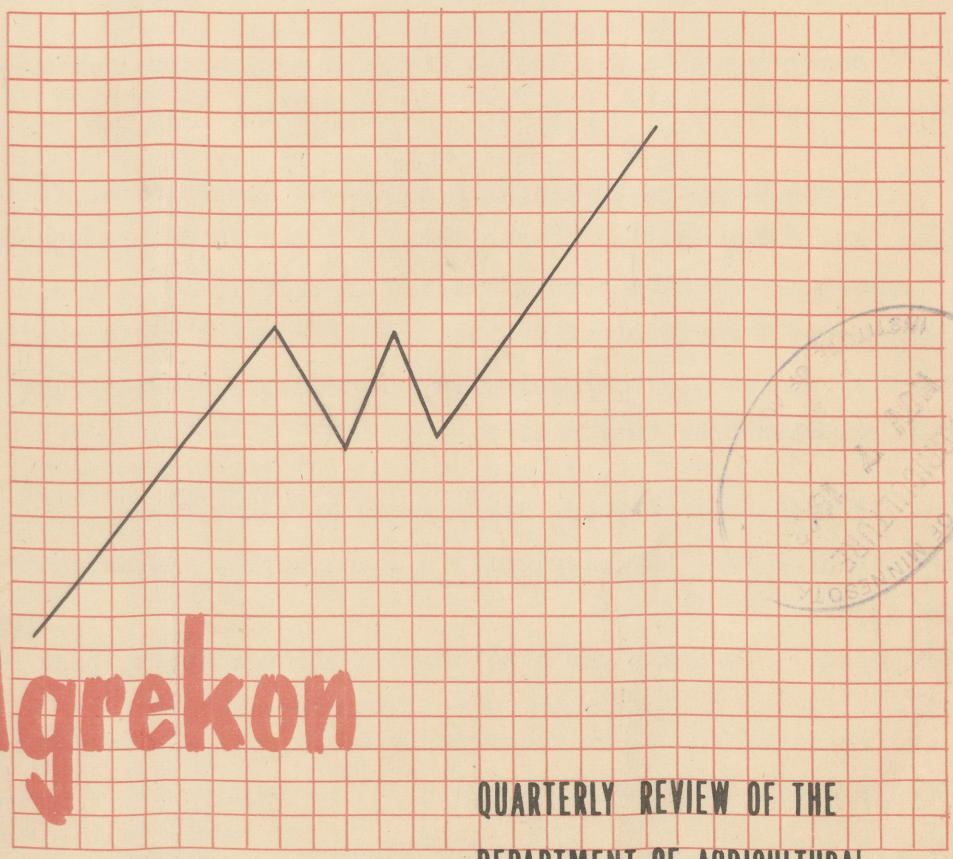

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QUARTERLY REVIEW OF THE
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THE MAIZE INDUSTRY IN SOUTH AFRICA - DANGER SIGNALS FOR THE FUTURE*

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INTRODUCTION

The production of maize in South Africa constitutes the most important branch of crop farming, as well as one of the most important branches of agriculture as a whole. According to estimates made by the Division of Economics and Markets, the gross farm value of the maize crop amounted to about R128 million in 1960. This represents 31.7 per cent. of the gross value of field crops and 16.4 per cent. of the value of all agricultural products.

The basic importance of the maize industry in the country's economy is further reflected by the following facts: That maize products, utilised directly for human consumption, are the source of about 35 per cent. of the calory intake of the population; and that the carrying out of all the marketing functions associated with handling and processing of the 35 million bags of maize, annually marketed by producers, creates an important outlet particularly for the production factors labour and capital.

In view of the economic importance of the maize industry, it is essential that an endeavour should continually be made to keep the industry on as sound a basis as possible. This task of ensuring a sound policy and efficiently implementing it, devolves in the first instance on the Maize Control Board, which is vested with certain statutory powers, in terms of the Marketing Act of 1937 (as amended), to exercise control over all phases of the marketing of the maize crop - including the power to fix producers' prices of maize and traders' prices of maize and maize products, with the approval of the Minister of Agricultural Economics and Marketing. All interested groups are represented on the Board, although maize producers are in

* Opinions expressed herein are those of the author and not necessarily those of the Maize Board.

the majority. The National Marketing Council and the Department of Agricultural Economics and Marketing, who act as advisers to the Minister, however, also carry responsibility as regards the formulation and application of policy.

It is the supposition of this article that various factors are present in the industry which create an unhealthy condition, whereby the industry can be plunged into a crisis that may have far-reaching effects on agriculture.

DEVELOPMENTS SINCE 1949/50

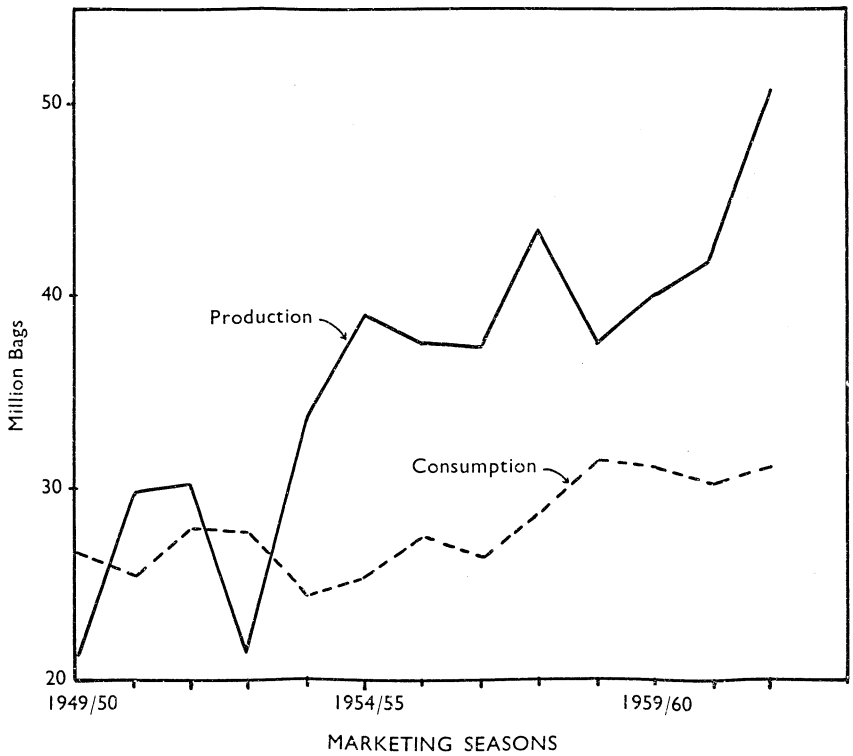
During the Second World War, and immediately thereafter, the relationship between production and internal consumption of maize rapidly changed. Where once surpluses were regularly produced, shortages occurred in individual years; and the Board was compelled during several seasons to import substantial quantities of maize from overseas. There were indications that, if the existing tendencies were to continue, a permanent shortage in local supply would be experienced.

World prices of maize were at a relatively high level and, whereas maize is a staple food in South Africa, the Government decided to encourage the production of maize by means of increased producers' prices.

Producers' prices of maize were sharply increased, particularly during the first three seasons after 1949/50, from 21/3d. (R2.12½) in 1949/50 to 30/- (R3.00) per bag in 1952/53. This represented an increase of 8/9d. (R0.87½) per bag while the average production costs, according to official estimates, increased by only 4/7d. (R0.46). The average net margin for the producer therefore increased by 4/2d. (R0.42) per bag, representing an increase of 71 per cent. in the margin of 5/10½d. (R0.59) for 1949/50. This was an exceptionally sharp increase for such a short period, and it positively served as a strong incentive to increase production.

As can be clearly seen from graph No. 1, production has since shown an increasing tendency, while the annual surplus over and above local requirements also increased. For the current season the surplus amounts to almost 19,000,000 bags (preliminary estimates), which is equal to 38 per cent. of the total production, or 44 per cent. of the quantity producers are

expected to market.



Graph No. 1.—Production and internal consumption of maize in R.S.A.

The serious implications, which this development holds for the industry, lie in the fact that as from 1955/56 maize has been exported at a loss (the loss is calculated on the basis of the Board's purchase price plus marketing costs). Admittedly the loss was small at the start, but it has increased appreciably during the past few years. On the one hand, a decline occurred in the world price of maize and, on the other, there was a gradual increase in the price at which the Board purchased maize from producers. As from 1955/56 the export loss has increased from £2 million (R4 million) to an estimated £5 million (R10 million) for the current season. During that period the loss per bag increased by about 1/6d. (15c).

A brief discussion of the basic factors associated with production, internal consumption and the export market will probably contribute towards a better understanding of the problem facing the maize industry at present.

THE INCREASE IN PRODUCTION

The increase in production mainly occurred in that portion of the crop that is produced by whites. Since the commercial growing of maize is completely dominated by the production of the whites, further discussion under this heading will be confined to this category.

The real maize producing area is described by the Maize Board as Area A; it comprises the provinces of the Transvaal and Orange Free State, and the magisterial districts of Mafeking and Vryburg in the Cape Province. An analysis of the geographical pattern of the increase in production shows that the increase occurred particularly in the traditionally important areas. According to the latest published agricultural census figures, 6.4 million bags of the 8.3 million bags by which the production by whites increased from 1950 to 1958 were produced in the North-eastern Free State, the North-western Free State, the Transvaal Highveld and the Western Transvaal.* During the corresponding period 55 per cent of the increase in the area planted to maize also occurred in these four areas. It is clear therefore that the increasing production is attributable not so much to the fact that maize is being grown in new areas of the summer rainfall region, but rather to more intensive cultivation in the recognised maize regions.

A further characteristic of the increase in production is that the increase in the area planted generally did not go hand in hand with a reduction in the average number of cattle per farm. The composition of the cattle herds, however, did undergo a change. During 1958 cows and heifers of one year and older represented about 59 per cent of the total number of cattle owned by whites in Area A, as against 53 per cent during 1950; oxen represented only 24 per cent of the total in 1958 as against 32 per cent in 1950. The number of sheep increased from 9.3 million to 12 million, while the percentage of wool sheep increased from 83 per cent to 91 per cent. The greatest increase in sheep numbers already occurred before 1955, probably as a reaction on the high wool prices ruling at the time. Generally speaking, however, the fact is that the increase in maize production has not taken place at the expense of the animal factor.

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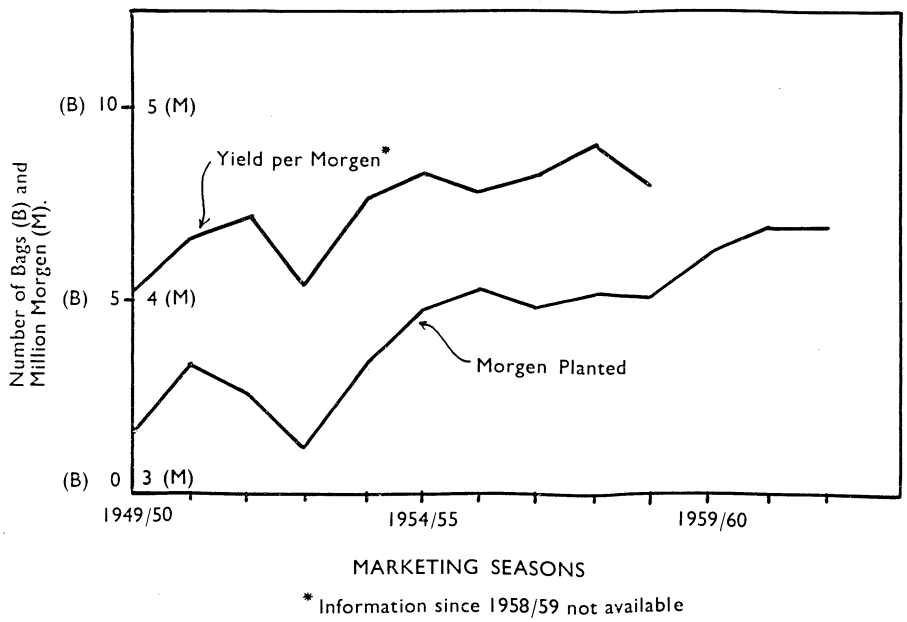
* The demarcation of areas is the same as that used by the Division of Economics and Markets for its crop estimates.

The salient feature of the period under discussion, however, is the rapid mechanisation which occurred in agriculture. For example, the number of tractors on farms increased from 22,000 (12,200 in area A) to 106,000 (66,900 in area A) from 1947 to 1958, while, at the same time, considerable amounts were invested in a large variety of accessory implements whereby the production of maize, with the exception of harvesting operations, was almost completely mechanised.

Although, normally, mechanisation is regarded as a substitution of the production factor labour, it appears that in South Africa this has not altogether been the case to date. Admittedly the number of permanent (male) white farm labourers in Area A decreased from 5,035 to 4,476 during the period 1950 to 1958, but the number of permanent (male) non-white farm labourers increased from 337,906 to 398,142. The total volume of agricultural production indicates that the average output (physical) per worker has increased, but the question arises whether the potential advantage of mechanisation has in fact been fully realised.

The increased production of maize on farms of whites is the joint effect of an increase in area planted and an increase in the average yield per morgen. Graph No. 2 indicates that the rate at which the area planted increases annually, is slowing down. It is possible that the general tendency to bring more land under cash crops has now lost its momentum. If that is so, the production factors labour and capital may be applied more intensively per morgen planted, which may also result in the physical productivity in the maize industry being increased.

The increased yield per morgen is generally attributed to the following factors: a greater measure of mechanisation, more effective fertilizing practices and better seed (especially the increased availability of hybrid seed). Statistical analyses confirm the almost obvious validity of the above statement - the latter two factors also augur well for the future. For example, the quantity of commercial hybrid seed sold to producers by registered seed merchants during the last planting season, represents only 27.5 per cent of the estimated seed requirements of the country. Therefore, in comparison with the U.S.A. where hybrid seed represents more than 90 per cent of the seed used, there is locally much scope for increased utilisation of hybrid seed.



Graph No. 2.—Average yield per morgen, in 200 lb. bags, and number of morgen planted to maize by whites.

In spite of the increase in yield per morgen, the production costs per bag, as calculated by the Division of Economics and Markets, did not decrease. In fact, the production costs, excluding the allowance for managerial remuneration and operators' earnings, increased from 15/4½d. (R1.54) per bag in 1949/50 to 21/1d. (R2.11) per bag in 1960/61. At this stage it would appear as if the record crop for the current year will also show a record average yield per morgen and consequently a decrease in the cost per bag. This poses the vexing question whether it is a fortuitous achievement, or whether it signifies a permanent break-through of improved production techniques on a wide front.

THE INTERNAL CONSUMPTION OF MAIZE

As can be seen in graph No. 1, the total internal consumption of maize does not assume a steady increasing pattern. The exceptionally high level at which consumption was maintained during 1958/59 and 1959/60, can be attributed to some extent to prolonged droughts in certain parts of the country; and for

this period the normal increase in consumption, that can be expected in the long run, may have been dominated by this short-term factor.

As regards the more important forms of consumption, the figures in the following table show how the position has developed since 1949/50 until recent seasons. The estimates, made by the Maize Board in collaboration with the Division of Economics and Markets, are naturally based on certain arbitrary assumptions, but may be regarded as a rough indication of the actual position.

International consumption of maize ('000 bags)

(Marketing years)

Type of consumption	1949/50	1956/57	1957/58	1958/59	1959/60
Human consumption ..	15,500	16,400	16,500	17,500	17,000
Animal consumption .	10,015	9,119	11,104	12,624	12,574
Industrial consumption	320	258	277	302	305
Seed and other*	497	748	780	765	567
Total	26,332	26,525	28,661	31,191	30,446

* Including physical losses

The most striking feature of the figures is that direct human consumption still represents more than 50 per cent of the total consumption. This consumption has a relatively stable pattern and its income elasticity coefficient* probably is well below 1.0. The urbanisation of the population also gives rise to changes in eating habits and, particularly in the case of the Bantu, this factor may in the long run have a restricting effect on direct consumption. Moreover, this position may be aggravated by the rapid economic development of the Bantu homelands and the border areas. Consequently, the increasing production can hardly be expected to be locally absorbed in this manner.

* Broadly defined here as the percentage change in the quantity purchased which, other things being equal, will be associated with a change of 1 per cent in the level of income.

Industrial consumption is negligible and does not offer any hope of large-scale expansion.

An extension of the local market to keep pace with production, therefore, has to be sought in animal consumption. What are the present characteristics of this consumption? Is such a rapid increase of consumption possible?

The salient features of the consumption of maize as animal feed are the following:

In the first instance very little maize is retained on the farms in the major producing areas. In spite of the fact that in 1958 about 63 per cent of the cattle, 60 per cent of the pigs, 56 per cent of the poultry and 34 per cent of the sheep owned by whites were found in Area A, only about 3.3 million bags (or 10 per cent of the crop) were retained on farms by all races in that area. This is in sharp contrast with the U.S.A., where about 60 per cent of the maize crop is consumed on the farms where it is produced.

Secondly, agricultural censuses and information collected by the Division of Economics and Markets this year, indicate that only about 44 per cent of the quantity of maize retained on farms by whites in Area A is utilised for animal feeding. This means that only about one-ninth of the total quantity of maize, consumed as animal feed, is consumed in the maize producing area proper on the farm where it was produced. This clearly shows that producers prefer to grow maize as a cash crop rather than to market it "on the hoof". Since this is such a general phenomenon, it must be accepted that it is the result of strong economic considerations.

Thirdly, the local market for the end products of the livestock industry is very limited; as far as some of these products are concerned, it is in fact already glutted. At present the buying power of the majority of the Bantu is not on such a high level that the daily consumption of meat, dairy and poultry products can be afforded to any material extent. Moreover, provisional calculations by the Division of Economics and Markets of the income and price-elasticity

coefficients* of the consumption of these products point towards unexpectedly low values. Even in the case of the poultry industry, which is the most intensive consumer of maize products in South Africa, the prospects of an appreciable increase in consumption are by no means encouraging.

A large-scale economic uplift of the Bantu may accelerate the expansion of the local market for these products, but this will probably not make itself felt so rapidly and strongly in the demand for maize as to be of any assistance in the present situation.

In view of the above-mentioned factors, it would appear that no rapid expansion in the demand for maize as stock-feed in the ordinary feeding routine can be expected; not even if there is a one-sided reduction in the price of maize. Only if a new, economic form of consumption can be developed, will it be possible to stimulate the local consumption to any material extent.

If the increasing surplus cannot be disposed of on the local market, what are the possibilities of selling it overseas?

THE EXPORT MARKET FOR MAIZE

Traditionally South Africa is an exporter of maize. In the five years preceding the Second World War, the average annual exports amounted to nearly 6 million bags. During the war the flow dried up completely, and export was resumed on a relatively small scale only towards 1947/48.

World prices were exceptionally favourable up to about 1953/54 and, up to that stage, the Board made handsome profits on the sale of maize for export. However, the quantities available for export were small. Towards 1954/55 the export surplus again reached the pre-war level, but by that time the profit margin had already become very slender and, as indicated in the following table, the Board annually incurred a loss on

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* Price elasticity is broadly defined here as the percentage change in the quantity purchased which, other things being equal, will be associated with a change of 1 per cent in the level of price.

export since 1955/56.

Quantities of maize and maize products exported and export losses incurred - 1955/56 - 1960/61

Season	Quantity exported ('000 bags)	Total loss R'000
1955/56	10,868	4,076
1956/57	11,200	1,388
1957/58	15,702	5,740
1958/59	11,743	5,274
1959/60	6,159	2,180
1960/61	9,800	4,050
1961/62*	18,880	10,000

* Provisional estimate of exportable surplus and export loss thereon.

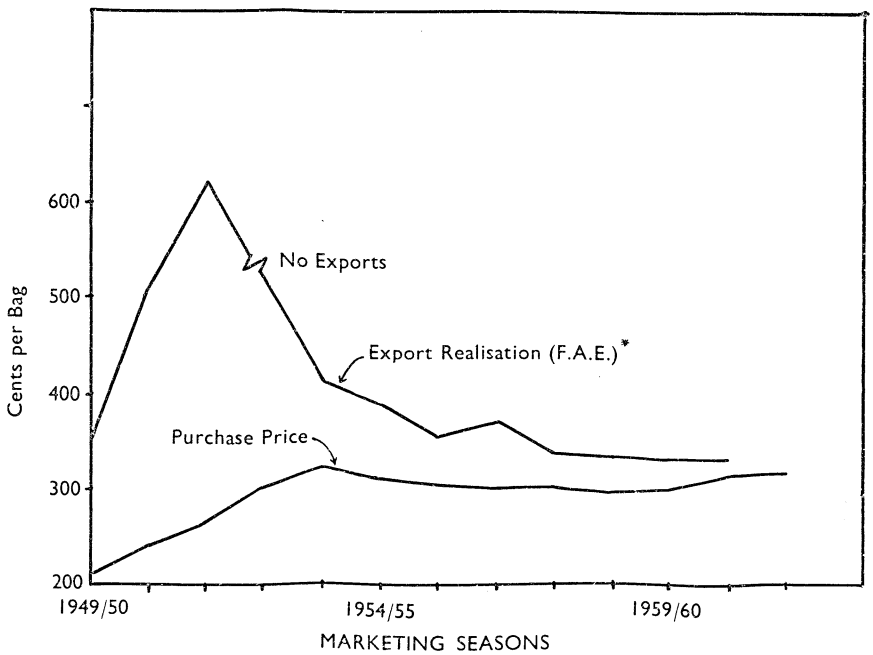
Admittedly the loss per bag was not considerable at the start, but in 1960/61 it had increased to almost 5/- (50c), while it is expected to be even higher for the current season.

The export losses are set off against the Maize Stabilisation Fund. Although up to 1959/60 the Treasury and local consumers also contributed to this Fund, producers made the biggest contributions to the Fund. The stabilisation fund levy, collected from producers, reduces the price which they eventually obtain; it is intended to discourage the production of surpluses. Thusfar it has definitely not had the desired effect on the volume of production.

Graph No. 3 reflects the average prices realised by the Board for export maize since 1949/50, as well as the prices at which the Board purchased maize (best grades) from producers. The pincer effect is clearly visible.

What are the prospects for the future?

The world situation is very discouraging. Despite the fact that the world trade in, and the consumption of, feed grains (of which maize is the most important) are still expanding annually, production has increased to such an extent that the joint stocks of the exporting countries are steadily growing. The U.S.A. alone has a surplus over and above normal reserves



* Free alongside Coastal elevator, i.e. before deduction of the Board's Marketing Costs.

Graph No. 3.—Purchase prices paid and average annual export prices realised by the Board.

which equals a number of years' total world exports. It is only the judicious disposal policy followed with regard to this surplus that has been preventing a total collapse of the world market.

In addition, large surpluses of barley and sorghums are present on the world market. In spite of substantial purchases by a new customer in the western market, viz. Red China, the glut of barley on the market during recent months also had an adverse effect on the market for maize.

Furthermore, there is a tendency with countries such as the Argentine, Thailand, Yugo Slavia, France and others purposely to encourage the production of maize and other feed grains. The first-mentioned two countries still export at profitable prices; and both claim that foreign exchange, which is essential

for their economic development, should mainly be earned by means of agricultural exports. As far as the other countries are concerned, it is merely part of their support programmes for agriculture, linked with a greater measure of self-sufficiency as an additional consideration.

The U.S.A., on the other hand, has launched an expensive emergency programme this year with the object of bringing about voluntary curtailment of the production of feed grains. Even if this programme were to prevent a further accumulation of stocks, it is doubtful whether the world position will in any way be relieved thereby - since production is steadily increasing in other countries.

At present the main outlets for South African maize (in order of importance) are Japan, the United Kingdom and West Germany. On the Japanese market, Thailand and the Argentine are the largest suppliers, while the U.S.A. and the Argentine are the chief suppliers of the other markets. As already stated, Thailand and the Argentine are still exporting at a profit (although the manipulation of the exchange rate for the Argentine peso has probably done much towards achieving this); and the U.S.A. is a rich country which exports only about 6 per cent of its maize crop. In spite of this, the volume of its exports represents nearly 50 per cent of the world total. The U.S.A. will be able to hold out for a long time in a world market on which price levels are kept low by chronic surpluses.

In the absence of war, South Africa's position on the world market for maize can, according to present indications, only be improved if a drastic reduction can be brought about in the cost structure of the local industry.

Reference is often made to the important contribution which maize exports make to the earning of foreign exchange, especially in the present situation. It should be borne in mind however that, if the current level of producers' prices is considered as essential for ensuring a reasonable income to the maize producers, such foreign exchange is being obtained on rather unfavourable terms. The question arises as to whether the relevant production factors cannot be employed more profitably in other directions; or, if the earning of foreign exchange in this manner should be considered an independent aim, whether the net cost of such foreign exchange should be borne by the maize industry alone.

SUMMARY

Summing up, it can be said that the maize industry is once more faced with a situation that may develop into a serious crisis - unless efficient corrective measures are speedily taken. The fact is that, at current price levels, much more maize is being produced than can be disposed of on the local market; and that, thusfar, increased production has not been accompanied by an absolute lowering of the cost structure.

The main purpose of production is to satisfy the internal demand, but at present less than 70 per cent of the production is required for this. Allowing production to continue at this level, and exporting the surplus at increasing losses, encourages the uneconomic employment of basic production factors. If a one-sided adjustment were to be enforced within the maize industry (for example through price reduction or marketing quotas), it would have to be on a scale that might have serious financial implications for a large number of farmers. To align the average production with consumption, will require a proportionate reduction of about 1,300,000 morgen in the area planted by whites alone (in practice this reduction will be even greater since the poorest soils will be withdrawn first), and the gross income of producers will, of course, decrease accordingly.

Before an adjustment on this scale can become practical policy, the implications thereof will have to be thoroughly considered from a national point of view.

What can be done in this connection?

The first essential step would be to analyse the general economic position of farmers in the maize producing areas. Particular attention will have to be given to the place which maize cultivation occupies in the income structure. This information is necessary in order to determine -

(a) the extent to which agriculture in these areas finds itself in an unfavourable economic position;

(b) to what extent maize production as one of the farming branches can be profitably undertaken; and

(c) the extent to which a possible adjustment of maize production to local consumption will affect the

income position of farmers. In other words, are there alternative fields in which the production factors, that will be released if maize is produced on a smaller scale, can be profitably employed? If such alternatives were to be less profitable than maize cultivation, would it still be in the national interest to attempt such an adjustment?

The maize industry is too important a branch of agriculture to attempt to solve problems associated with it in isolation. A broad approach is required.

Secondly, if it were found on socio-economic grounds that support of the income level of the farmers is essential and that this can be promoted to an important extent by means of the maintenance of maize prices (regardless of the size of the surplus), should the costs of such support not be recovered from the general tax payer and not from the local consumer of maize?

Thirdly, if it were decided that certain adjustments within the maize industry will be in the national interest, precautions should be taken to ensure that such adjustments can be carried out effectively in practice. Experience has shown that schemes launched with the best intentions sometimes fail completely because they cannot be effectively applied in practice.

In the fourth instance the aim should always be to expand the local market, especially by developing and/or propagating profitable new uses of maize and maize products. This aspect is at present receiving the serious attention of the Maize Board.

Lastly, the individual producer should realise that his own actions are of primary importance in the matter. A continued effort to increase the productivity of his farming unit as a whole is a prerequisite, regardless of the measures that may be taken in terms of items two and three above. Most probably some farmers already had enough of this advice, but the fact remains that sound farm-enterprise planning, together with improved farm management, represents the spring-board to an independent and a vigorous agriculture.

(The merits of the more important measures that could possibly be taken to bring about adjustments within the industry, will be discussed in a following article.)