

AN ANALYSIS OF THE FINANCIAL REPORTING COMPLIANCE OF SOUTH AFRICAN PUBLIC AGRICULTURAL COMPANIES

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Abstract

This article assesses the extent to which South African public companies that are engaged in agricultural activities are complying with the compulsory recognition and measurement and compulsory and voluntary disclosure requirements of IAS 41 Agriculture. Sixteen large South African public companies with material holdings of biological assets in their statements of financial position were selected for analysis. The results of the analysis show that the majority of South African agricultural companies are using fair value to measure their biological assets at initial recognition as well as at the end of each reporting period. Most of these companies are complying with the compulsory disclosure requirements of IAS 41, and are also providing certain of the recommended voluntary disclosures listed in IAS 41. The study concludes that the measurement methods used by companies to value their biological assets and the nature and extent of both compulsory and voluntary disclosures of these assets are sector-specific. This is consistent with previous research findings. This study contributes to the existing literature by providing a baseline on the financial reporting of agricultural entities in South Africa prior to the implementation of IFRS 13.

Keywords

Agriculture, biological assets, compliance, disclosure, fair value

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1. INTRODUCTION

South African public companies, including those companies listed on the Johannesburg Securities Exchange (JSE), are required in terms of the Companies Act of South Africa, no. 78 (South Africa, 2008), to comply fully with International Financial Reporting Standards (IFRS) in the preparation of their annual financial statements. It should therefore follow that all public South African companies that engage in any form of agricultural activity comply fully with the requirements of International Accounting Standard 41 *Agriculture* (IAS 41).

IAS 41, issued in 2001, was a bold step in the international harmonisation programme initiated by the International Accounting Standards Committee (IASC), and continued later by the International Accounting Standards Board (IASB). IAS 41 is applicable to entities engaged in agricultural activities for periods beginning on or after 1 January 2003 (IASC, 2001). In terms of IAS 41, entities engaged in agricultural activities are required to measure all biological assets at fair value less estimated point-of-sale costs on initial recognition and at the end of each reporting period. They are also required to measure all agricultural produce at fair value less point-of-sale costs at point of harvest.

At the time of its issue in February 2001, IAS 41 was regarded by some as the most comprehensive departure from historical cost accounting to date (Elad, 2004). Prior to its issue, there was significant opposition to the IASC's *Draft Statement of Principles on Agriculture* (DSOP) and particularly to the proposal that fair value adjustments should go through profit or loss in full in the period of adjustment (IASC, 1998). The concern was that the inclusion of unrealised gains and losses in profit or loss would lead to increased volatility in earnings in an industry particularly vulnerable to price and climate fluctuations and extreme geo-climatic events (IASB, 2013a). This remains a concern today, more than ten years after IAS 41 was first issued.

Agricultural companies form a large part of the South African economy and, as suppliers of agricultural produce, contribute significantly to other major sectors of the economy. While there have been a number of studies that have focused on the application of IAS 41 to listed companies in other countries, there has been no recorded study of the extent to which South African agricultural companies are complying with the recognition, measurement and disclosure requirements of IAS 41. As IAS 41 offers companies a number of choices when it comes to fair value measurement and contains both compulsory and recommended disclosures, it was necessary to use a method of analysis capable of testing for the full range of possible compliances.

IAS 41 was amended by the introduction of IFRS 13 in 2011. The paragraphs which contained the fair value hierarchy in IAS 41 were deleted and the details applicable to the fair value measurement of biological assets and agricultural produce were included in the fair value methodology proposed in IFRS 13. The financial statements of South African public companies that have material holdings of biological assets in their statements of financial position for reporting periods beginning before 1 January 2013 were analysed because, thereafter, entities are obliged to apply IFRS 13 in combination with IAS 41. This study therefore provides a baseline on the financial reporting of public agricultural entities in South Africa prior to the implementation of IFRS 13 and may provide a starting point for further research in this field within the agricultural sector in South Africa.

A review of current literature on the application of IAS 41 in different geo-political and economic regions follows this introduction. The next section provides an overview of the research

methodology used for this study, the section which follows provides the research results and a discussion of these results, and the final section concludes.

2. LITERATURE REVIEW

At the time of its issue in February 2001, IAS 41 was seen as both a radical departure from traditional accounting for biological assets as well as an early test of fair value accounting (Fisher, Mortensen & Webber, 2010; Ore, 2011). However, concerns about the ability of historical cost accounting to address the unique reproductive and natural transformative nature of biological assets in accounting literature date back as far as 1972 (Cowan, 1972).

A review of accounting standards in issue at the time shows that IAS 41 was the first accounting standard issued by the IASC that required the use of fair value accounting for the subsequent measurement of non-financial assets (Cairns, 2006). Argilés and Slof (2001) assert that IAS 41 introduced important improvements which could assist entities in the agricultural sector to prepare financial statements that are more acceptable to agricultural lenders. They indicate that the most significant improvements introduced by IAS 41 relate to the important definitions it provides, as well as the guidelines it contains for the valuation and presentation of biological assets.

There has been considerable international research around the financial reporting of entities engaged in agricultural activities in different parts of the world, and a number of themes can be identified in the literature, some of which are relevant to the research conducted as part of this study. Because this study focuses on both the fair value measurement of biological assets as well as the compulsory and voluntary disclosures listed in IAS 41, this literature review looks at areas of debate relevant to both these topics.

2.1 Standardisation of disclosure

Research on the standardisation of disclosure indicates the existence of definite country groupings within which disclosure is more similar and standardised, but also highlights significant differences in disclosure between countries as well as from one agricultural sector to another (Leuz, 2010; Nobes, 2006; Nobes & Stadler, 2013). In recent years there has been a move in IFRS towards more compulsory disclosure as well as increased guidance on suggested voluntary disclosures. The hope is that the inclusion of more extensive compulsory disclosures in the accounting standards will lead to greater standardisation of disclosure and therefore to greater comparability within economic sectors and across economic regions.

On the question of whether IAS 41 has contributed to the standardisation of disclosure in financial reporting, Perry (2008) argues that the level of additional disclosures required under IAS 41 will only serve to confuse readers of financial statements. Elad and Herbohn (2011) found a lack of comparability in disclosure practices among 78 entities in the UK, France and Australia, whose financial statements they analysed, with only a 36% compliance with the compulsory disclosure requirements of IAS 41, with most entities using historical cost instead of fair value to value their biological assets. The research that is part of the current study contributes to this literature to the extent that it looks at the compliance of South African public companies with both the compulsory and recommended voluntary disclosures contained in IAS 41.

2.2 Comparability of financial statements

Financial information is more useful if users are able to compare similar information between entities in the same industries as well as from one period to another (IASB, 2010b). Comparability implies being able to compare information across entities where they have similar assets, liabilities or income sources. The consensus among researchers into the impact of IAS 41 on the comparability of financial statements among agricultural entities is that, in this respect, IAS 41 has so far failed completely to enhance comparability (Aryanto, 2011; Elad & Herbohn, 2011; Fisher, Mortensen & Webber, 2010; Herbohn, 2006; Ore, 2011).

Elad and Herbohn (2011) argue that IAS 41 has not managed to enhance comparability among entities engaged in agricultural activities and has failed to change accounting practices and has instead created an illusion of comparability. They argue that IAS 41 provides too many alternative valuation methods involving too much estimation by management for any reliable consistency to be achieved. Given the number of options that existed in IAS 41 for the calculation of fair value, and the extent of the use of estimates in calculating these values, the argument of Elad and Herbohn (2011) is persuasive, namely that it is almost impossible for IAS 41 to enhance comparability unless entities in the same economic sectors agree to apply similar methods to the valuation of their biological assets.

2.3 International harmonisation

Research in this area is focused mainly on the incompatibility of IAS 41 with local accounting frameworks in operation in different countries. While the application of IFRS has been mandatory in Europe since 2005 (Herbohn & Herbohn, 2006), there are many European countries with their own accounting systems that are still incompatible with IFRS (Hinke & Starova, 2013) and with IAS 41 in particular (Athanasios, Stergios & Laskaridou, 2010; Grege-Staltmane, 2010).

Elad and Herbohn (2011) found that the incompatibility of IAS 41 with the existing French accounting model as well as the European Farm Accountancy Data Network (FADN) and the European Union's Fourth Directive resulted in the majority of European companies analysed not applying the fair value requirements of IAS 41 and valuing their biological assets at historical cost instead. Research by Argilés, Blandón and Monllau (2011 & 2009) on the use of historical cost accounting in Spain confirmed, however, that the nature of farming makes the valuation of biological assets based on historical cost difficult due to the fact that these assets are affected by procreation, growth, death, as well as joint-cost situations.

There is a growing need for economically smaller European countries to adopt IAS 41 in an attempt to attract foreign investment to their agricultural sectors which traditionally occupy an important place in their national economic structure (Feleaga, Feleaga & Raileanu, 2012). Armstrong, Barth, Jagonlinzer and Riedl (2014) found that investors and banks in Europe reacted positively to the move by companies to IFRS-compliant financial statements. There are, however, still significant differences in financial reporting, both from one continent to another as well as between different countries in quite close geographical proximity. These differences exist at an overall level in relation to the adoption of IFRS in different regions and countries, as well as in relation to IAS 41 specifically.

2.4 Recognition of fair value gains and losses

One of the most contentious aspects of IAS 41 is the requirement to recognise all fair value gains or losses in profit or loss in the period in which the gains or losses are incurred (Elad, 2004). This applies to both the realised gains or losses on agricultural produce at point of harvest as well as the unrealised gains or losses on the remeasurement of the biological assets at fair value less estimated point-of-sale costs. Many of the comment letters in response to earlier drafts, prior to the publication of IAS 41, suggested that a disaggregation of gains and losses from agricultural produce from those of biological assets would be more useful and would be better aligned with the existing accounting standards that take unrealised gains or losses to equity to be recycled to profit or loss as they are realised (IASC, 1996, 1998, 1999 & 2000). Others indicated that it would not be practical to disaggregate gains from agricultural produce from those of biological assets.

One of the arguments in favour of the disaggregation of realised and unrealised fair value gains is that recognising unrealised gains in profit or loss impacts negatively on the entity's performance indicators and result in unrealistic dividend expectations (Azevedo, 2007). This point is also made by Herbohn and Herbohn (2006) and St Clair-George (2007), who indicate a concern regarding the expectations created through the recognition of unrealised profits despite the possible lack of cash resources to distribute a dividend.

Bohusova, Svoboda and Nerudova (2012) argue that, while the biological transformation of biological assets reflects a real gain or loss to the agricultural entity, changes in the fair value of the biological assets due to price and currency changes do not represent permanent changes. These changes are temporary fluctuations which could easily reverse a number of times during the life cycle of multi-annual biological assets. They conclude that it is important to apply the principles in the Conceptual Framework and other accounting standards consistently and that the influence of the biological transformation and the price fluctuation on the total change in fair value should be disaggregated (Bohusova, Svoboda & Nerudova, 2012). While disaggregating these gains or losses may prove onerous in certain industries, doing so may prove to be the only way to achieve financial information that is a faithful representation of events and that is truly relevant.

2.5 Volatility of earnings

Research in this area indicates a definite increase in earnings volatility in the reported profits of agricultural entities after the adoption of IAS 41 (Elad & Herbohn, 2011). While some researchers argue that the volatility introduced into income reflects the inherent risks of an investment in an industry prone to natural disasters inherent in all agricultural activities (Butler, 2001; Herbohn, 2005), others argue that the volatility in earnings is a direct result of the requirement of IAS 41 to recognise both realised and unrealised gains and losses due to biological transformation directly in profit or loss (Herbohn & Herbohn, 2006).

Waine (2009) states that, while the inclusion of unrealised profits due to biological transformation in profit or loss is designed to assist agricultural entities to raise capital, the fluctuations in earnings that result from this accounting treatment have a negative impact. Elad and Herbohn (2011) found that most accountants and auditors agreed that the fair value model prescribed by IAS 41 increased earnings volatility.

Landsman (2007) cautions against the potential within any fair value methodology of deliberate manipulation of fair values by management as well as the problem of measurement error in the

fair valuing of assets and liabilities. He asserts that while deliberate manipulation of the numbers by management and measurement error do contribute significantly to increased earnings volatility, a certain amount of earnings volatility can be directly attributed to the underlying economic volatility inherent in agricultural activities.

Research in this area indicates a definite increase in earnings volatility in the reported profits of agricultural entities after the adoption of IAS 41. The longer the period from gestation to maturity of the biological assets, the greater the impact of IAS 41 on the volatility of earnings. This is why this issue is of particular relevance to entities in the timber, paper and packaging sectors.

2.6 Plantations and forestry sectors

Many of the entities engaged in plantation farming and forestry have expressed their concerns about the relevance to users in their industries of financial information produced in compliance with IAS 41 (Elad & Herbohn, 2011; Fisher, Mortensen & Webber, 2010). In addition, the plantations and forestry sectors have consistently opposed the adoption of IAS 41 in their financial reports due to the complexity and cost of obtaining a relatively realistic fair value for standing timber (Elad & Herbohn, 2011). IAS 41 allows for entities to use a discounted cash flow (DCF) model to obtain a fair value for their biological assets in situations where there is no active market and where market-based values are considered unreliable.

PricewaterhouseCoopers (PWC), in their publication *Forest Industry: Application Review of IAS 41, Agriculture, The Fair Value of Standing Timber*, first published in 2009 and updated in 2011, indicate that there are major questions among preparers and investors concerning the application of IAS 41 to the timber industry (PWC, 2011). In this report, they discuss the complexities involved in the valuation of standing timber, indicating that the process includes the use of several significant assumptions, each of which requires considerable judgement. Small variations in key factors can result in significant effects on the financial statements and on profit or loss in particular.

This point is also made by Svensson, Nylen and Gunnevik (2008), who indicate that in Sweden, where trees are mostly multi-annual consumable biological assets, there can be a period of a hundred years from planting to felling. This has a direct impact on the DCF valuations obtained for the standing timber, significantly lowering these valuations. The longer the period from gestation to maturity of the biological assets, the greater the impact of IAS 41 on the volatility of earnings. This is consistent with the findings of Herbohn and Herbohn (2006) that the recognition of unrealised gains from changes in the fair value of timber assets significantly increased the volatility or earnings reported in the income statements of these entities.

PWC (2011) make the final point in their industry review that climate change has already had a number of significant impacts on the timber industry, the first being that it has a direct effect on the timber growth rate and, therefore, on the valuation of standing timber, secondly, that a move to use woody biomass as a renewable energy source will also have a major impact on the industry and, thirdly, that the increasing tradability of forest carbon credits may enable these companies to quantify the contribution of their forests to the environmental health and sustainability of the planet.

It can be concluded from the above points that most researchers are critical of the impact that the application of IAS 41 has had on the annual financial statements of agricultural entities. It would appear from the lack of compliance with the disclosure requirements of IAS 41 by listed companies in many countries that the disclosure requirements of IAS 41 are too onerous,

particularly where the group operates in diverse industries and where biological assets do not represent a major portion of their total asset value. While there are a number of technical issues raised in the accounting literature around the adoption of IAS 41 by agricultural entities in different countries, industries and regions, and while there appears to be little consensus on whether or not IAS 41 has enhanced comparability or promoted international harmonisation, it is clear that, for large listed companies in active economic areas, IAS 41 provides a useful tool for the measurement and valuation of biological assets and agricultural produce.

3. RESEARCH METHODOLOGY

The research took the form of an analysis of the disclosures provided by the selected companies in their annual financial statements. The research is empirical and uses quantitative content analysis (Krippendorf, 2012).

3.1 Population

Companies registered in the Republic of South Africa are required, in terms of section 30 of the Companies Act, No. 71 of 2008, to prepare annual financial statements within six months of their financial year-end (South Africa, 2008). In addition, public companies, as defined in section 1 of the Companies Act of 2008, are required to prepare these financial statements in compliance with International Financial Reporting Standards in terms of the Companies Regulations of 2011.

A list of all companies registered on the JSE was prepared and scrutinised to identify any companies with material holdings of biological assets in their statements of financial position. In addition, audit firms and professionals in the industry were consulted to identify large unlisted public companies with material holdings of biological assets. The IASB describes materiality as the entity-specific component of relevance (IASB, 2014) and has indicated that materiality is intended to be applied as a filter to ensure that the financial statements are an effective summary of information and that they do not contain immaterial information that could detract from the relevance of the information provided. For this reason, companies with holdings of biological assets less than 3% of total assets were excluded from this study, as it was considered that detailed disclosure at this level of materiality would not enhance the relevance or usefulness of the financial statements. As a result, a list of sixteen companies with material holdings of biological assets above 3% or more of total assets was compiled. This includes all twelve companies listed on the JSE that had material holding of biological assets as well as four large non-listed public companies.

3.2 Scope and limitations

The last complete audited annual financial statements for the selected companies for reporting periods beginning before 1 January 2013 were used in this study, as IFRS 13, the IASB standard on *Fair Value Measurement*, is applicable to financial statements for reporting periods beginning on or after 1 January 2013 (IASB, 2011). This study analyses compliance of companies with IAS 41 prior to the amendments introduced by IFRS 13, and therefore uses the wording in the IAS 41 standard as it was at that time. It was noted that none of the companies included in the study had elected to early-adopt IFRS 13.

This study does not attempt to analyse the quality of corporate reporting of the companies selected, but rather to quantify their compliance or non-compliance with the compulsory recognition, measurement and disclosure requirements of IAS 41, as well as the extent to which these companies provided any of the additional voluntary disclosures recommended in IAS 41.

This study is limited to large public companies, although the vast majority of companies in this sector of the South African economy are private unlisted companies, many of which still retain significant family shareholdings. The reason for not including the latter companies is that small and medium-sized entities in South Africa are not required to comply fully with IFRS, but rather have the choice of complying with IFRS in full or with the *International Financial Reporting Standards for Small and Medium-sized Entities* (IFRS for SMEs), published by the International Accounting Standards Board in 2009 (IASB, 2009).

3.3 Financial statement analysis

The analysis that forms the basis of this study was focussed on three main areas, the details of which are as follows:

- Recognition and measurement model
The financial statements of these companies were analysed to identify whether they apply either the fair value or the historical cost model to the recognition and measurement of their biological assets and their agricultural produce. If the fair value model is used, the method used to arrive at fair value, if disclosed, was analysed.
- Compliance with compulsory disclosure requirements of IAS 41
The annual financial statements of these companies were further analysed to identify the extent to which they comply with the compulsory disclosure requirements of IAS 41, in relation to both their biological assets and their agricultural produce.
- Voluntary disclosures recommended in IAS 41
IAS 41 contains a number of suggested additional voluntary disclosures and companies were assessed on the extent to which they provide any of the voluntary information recommended in IAS 41.

Further detail on the methodology used in each stage is provided with the results of the tests in the next section.

4. RESULTS AND DISCUSSION

4.1 Measurement methods used for recognition of biological assets

Because the valuation of biological assets is dependent on their potential future cash flows, and because the cash flows from these assets are in turn dependent on the way in which that asset is used by an agricultural entity, for the valuation and measurement of biological assets, the analysis was broken down into five distinct categories, identified in TABLE 1. Since the different categories of biological assets result in differences in future cash flows, an analysis that did not acknowledge these differences would be less useful than one that did.

However, in relation to agricultural produce, which is the biological asset at the point just prior to transfer to inventory, the future cash flows are less uncertain, so that it was not considered

necessary for the categorisation to be as detailed. The analysis of the valuation of agricultural produce was therefore only divided into two categories, plants and livestock.

TABLE 1: Biological asset categories identified in the annual financial statements

<i>Bearer Plants</i>	<i>Consumable Plants</i>		<i>Bearer Livestock</i>	<i>Consumable Livestock</i>
	<i>Multi-annual</i>	<i>Short-term</i>		
6	5	6	7	7

Source: Authors' analysis

This study identifies the specific methods used by the selected companies to measure their biological assets at the end of the reporting period based on the fair value hierarchy stipulated in IAS 41 (IASB, 2010a). The different categories of biological assets were analysed separately in order to identify industry trends. TABLE 2 describes the different measurement methods used for this analysis and TABLE 3 sets out the results of the analysis.

TABLE 2: Methods used for measurement of biological assets

<i>Code</i>	<i>Description</i>
1	Fair value less costs to sell based on unadjusted quoted price in active market (IASB, 2010a: par. 17).
2	Fair value less costs to sell based on recent market transaction price (IASB, 2010a: par. 18(a)).
3	Fair value less costs to sell based on adjusted market price for similar asset (IASB, 2010a: par. 18(b)).
4	Fair value less costs to sell based on combination of adjusted market price, industry data and sector benchmarks (IASB, 2010a: par. 18(a - c)), with price, data or benchmark used specified.
5	Fair value less costs to sell based on present value of future cash flows/DCF modelling (IASB, 2010a: par. 20).
6	Fair value less costs to sell using combination of methods based on industry data and management estimates, with no further details given.
7	Cost less accumulated depreciation and impairment (IASB, 2010a: par. 30).

Source: Authors' analysis

TABLE 3 shows that there are distinct differences between the methods used by companies to measure the different classes of biological assets. The most significant fact revealed by this analysis is that none of the companies used an unadjusted recent quoted price in an active market to measure the fair value of their biological assets, or even a recent market price adjusted for any changes from the date of the price used and the company's reporting date.

TABLE 3: Measurement of biological assets by asset type

Method Used	Bearer Plants (%)	Consumable Plants: Multi-Annual (%)	Consumable Plants: Short-term (%)	Bearer Livestock (%)	Consumable Livestock (%)
1	0	0	0	0	0
2	0	0	0	0	0
3	0	20	17	29	43
4	0	0	0	14	0
5	100	80	83	14	14
6	0	0	0	14	29
7	0	0	0	29	14
Total	100	100	100	100	100

Source: Authors' analysis

All the companies with material holdings of bearer plants chose to measure these assets using an adaptation of the DCF method. Methods varied from a straight DCF calculation to a version of present value of future cash flows expressed as escalated average cost adjusted for the remaining expected life or current replacement cost of planting and establishment, amortised over the period of their productive life.

Most companies with multi-annual consumable plants preferred to measure their plantations using a DCF model by measuring the volume of timber based on the maturity of each plantation multiplied by the expected future selling price adjusted by applying a market related pre-tax discount rate. The remaining companies used an adjusted market price for a similar asset, also using volume of timber in the calculation. The difference between the two methods is that the first uses an adjusted anticipated future price while the second uses the latest price available in the reporting period.

Most of the companies identified as having short-term consumable plants had standing sugar cane and chose to measure these assets using the expected price for the following season adjusted for the percentage sucrose content at the end of the reporting period, less estimated costs of harvesting, transport, packaging and other selling costs. This is a short-term adaptation of a DCF calculation, looking only at the next twelve to eighteen months. Companies used the price they expected to receive for the assets in the next reporting period.

For bearer livestock, the measurement methods were more varied. Most companies used either an adjusted market price for a similar asset, a DCF-based method or the more general option of a combination of market price if available, or sector benchmarks and industry data while two companies used the IAS 41 allowed alternative of cost less accumulated depreciation and impairment.

Companies with consumable livestock consisted mostly of companies with either abalone or poultry. All the companies that had abalone as biological assets used the IAS 41 paragraph 18(b) method of adjusted market price to value harvested abalone, with the adjustment based on the weight of the abalone harvested. The method preferred by companies with poultry as biological assets was the more general option of basing their fair value calculation on active markets, where

appropriate, or management's assessment of the fair value based on available data and benchmark statistics (IASB, 2010a).

While the valuation methods varied considerably, there was significant consistency in the valuation methods used by companies with the same types of biological assets. The fact that none of the companies in this study used an unadjusted market price in an active market, or even an adjusted recent market transaction price, lends weight to the findings of previous studies in other countries, that fair valuing of biological assets is a complex, costly and time-consuming process.

4.2 Measurement of agricultural produce at point of harvest

IAS 42 paragraph 13 requires entities engaged in agricultural activities to measure the agricultural produce harvested from their biological assets at its fair value less estimated point-of-sale costs at point of harvest (IASB, 2010a). This paragraph states further that for agricultural produce, its fair value less estimated point-of-sale costs at the time of harvest should be used as the cost at that date when applying IAS 2 *Inventories*. IAS 41 contains no provision for the possibility that the fair value of agricultural produce may not be measurable at point of harvest. Rather, IAS 41 paragraph 32 emphasises that the fair value of agricultural produce at point of harvest can always be measured reliably.

Because the Standard does not allow for an exception to this requirement, it does not provide entities with additional guidance and disclosure requirements if they have not complied with this. But, in paragraph 47, it does require entities to provide disclosure relating to the methods and significant assumptions applied in determining the fair value of each group of agricultural produce at point of harvest. This compulsory disclosure should therefore provide an indication of where entities have not used fair value less estimated point-of-sale costs to value agricultural produce at point of harvest.

It would therefore have been expected that 100% of the companies analysed used fair value less estimated point-of-sale costs as the basis for their recognition of agricultural produce sold or transferred to inventory for the period. Of the companies analysed, nine had plants and seven had livestock as agricultural produce. TABLE 4 provides the results of the analysis of the valuation methods used for the recognition of agricultural produce at point of harvest for the sixteen companies with material holdings of biological assets.

TABLE 4: Method of valuation of agricultural produce at point of harvest

	Total (%)	Plants (%)	Livestock (%)
Fair value based on adjusted market price or industry data	44	22	71
Fair value based on future cash flows	50	78	14
Cost less accumulated depreciation and impairment	6	0	14
Total	100	100	100

Source: Authors' analysis

While the majority of companies analysed said that they measured their agricultural produce at point of harvest at fair value less estimated point-of-sale costs, few provided any detail as to

how this fair value was calculated. Where this was the case, this study assumes that these companies used the same method of valuation for their agricultural produce as they did for their biological assets.

Most of the companies with plants as agricultural produce based their valuation on future cash flows with the remainder using an adjusted market price or industry data. Just over half of the companies with livestock as agricultural produce used an adjusted market price or industry data to value these assets while some of these companies provided no information relating to the method used to value their agricultural produce.

In order for this information to be useful to users of financial statements, companies need to provide more information on how the fair value and the costs to sell are determined for their agricultural produce at point of harvest. Unfortunately not a single company that held or sold agricultural produce harvested from its own biological assets provided users with any level of detailed disclosure relating to their agricultural produce.

This trend towards an apparent lack of disclosure by companies relating to valuation of their agricultural produce was further substantiated when analysing companies' compliance with the compulsory IAS 41 disclosure requirements for agricultural produce. These findings suggest that companies need to pay more attention to their explicit disclosures for agricultural produce.

4.3 Compulsory disclosure of biological assets

In order to analyse the compulsory IAS 41 disclosures for entities with biological assets, each of the seven compulsory disclosures was given a code and the annual financial statements of the companies were analysed to identify the presence, or lack thereof, of each compulsory disclosure. In addition, the overall compliance of each company with all seven of the compulsory disclosures listed above was also calculated and analysed. The results of the above analysis appear in TABLE 5.

All the companies complied with the disclosure requiring them to provide a description of each group of biological assets, and provided a reconciliation of changes in the carrying amount of biological assets from the beginning to the end of the period, but the quality of this disclosure varied considerably from one company to the next.

Most of the companies provided users with details of the nature of their activities involving each group of biological assets, as well as the aggregate gain or loss from change in fair value less estimated point-of-sale costs of the biological assets during the period included in profit or loss. However, qualitative disclosures that required them to provide more detailed compliance were given less attention by the companies, with an average score of only 63% for disclosures of the methods and significant assumptions applied to determine fair value and information on the financial risk management strategies relating to their agricultural activities. The score for quantitative disclosures where physical quantities were required was much lower, with only 44% of companies complying with this disclosure. Companies with plants as biological assets had the highest overall compliance with the compulsory disclosures at 87%, which was 20% higher than those with livestock holdings, which had an overall compliance of only 67%.

TABLE 5: Compulsory IAS 41 disclosure items applicable to biological assets

	<i>Total (%)</i>	<i>Plants (%)</i>	<i>Livestock (%)</i>
Aggregate gain or loss on initial recognition of biological assets and agricultural produce and from a change in fair value less estimated point-of-sale costs of biological assets during period included in profit or loss (IASB, 2010a: par. 40).	88	89	86
A description of each group of biological assets (IASB, 2010a:par. 41). A group of biological assets is defined in IAS 41 paragraph 5 as “an aggregation of similar living animals or plants”.	100	100	100
Nature of activities involving each group of biological assets (IASB, 2010a: par. 46(a)).	94	89	100
Estimates of physical quantities of each group of biological assets at end of period (IASB, 2010a: par. 46(b)(i)).	44	56	29
Methods and significant assumptions applied in determining the fair value of each group of biological assets (IASB, 2010a: par. 47).	63	89	29
Financial risk management strategies relating to agricultural activities (IASB, 2010a: par.49(c)).	63	89	29
Reconciliation of changes in carrying amount of biological assets from beginning to end of period (IASB, 2010a: par.50)	100	100	100
Mean of compulsory disclosures of biological assets	79	87	67

Source: Authors' analysis

4.4 Compulsory disclosure of agricultural produce

There are only three compulsory disclosure requirements for agricultural produce. A code was given to each compulsory disclosure, and financial statements were analysed to identify the existence of these disclosures. The results of this analysis are presented in TABLE 6.

As the disclosure requirements relating to agricultural produce do not appear to be onerous, one might have expected compliance with these disclosures to be high. On the contrary, only 6% of the annual financial statements showed any compliance with quantitative disclosures where physical quantities were required, with only one company in the plants group providing estimates of physical quantities of output of agricultural produce for the period. Only 50% of the annual financial statements analysed contained the IAS 41 qualitative disclosures that require companies to provide more detailed information relating to the methods and assumptions used in the valuation of agricultural produce.

TABLE 6: Compulsory IAS 41 disclosure items applicable to agricultural produce

	<i>Total (%)</i>	<i>Plants (%)</i>	<i>Livestock (%)</i>
Fair value less point-of-sale costs of agricultural produce harvested or transferred to inventory during reporting period (IASB, 2010a: par. 48).	81	78	86
Estimates of physical quantities of output of agricultural produce during period (IASB, 2010a: par. 46(b)(ii)).	6	11	0
Methods and significant assumptions applied in determining the fair value of each group of agricultural produce at point of harvest (IASB, 2010a: par. 47).	50	56	43
Mean of compulsory disclosures of agricultural produce	46	48	43

Source: Authors' analysis

The IAS 41 compulsory disclosure relating to agricultural produce which was most consistently adhered to was the disclosure of the aggregate fair value less point-of-sale costs of agricultural produce harvested or transferred to inventory during the period, with 81% of companies analysed providing this value, most of them as part of the reconciliation of the carrying value of biological assets from the beginning to the end of the period in the biological assets note. Overall, only 46% of the compulsory disclosures relating to agricultural produce were complied with. Companies with plants as biological assets had higher compliance at 48%, compared to 43% for companies with livestock.

4.5 Compulsory disclosures where fair value is not used

Looking at the measurement bases used by the selected companies, only two companies used the allowed alternative of cost less accumulated depreciation and impairment to value one or more group of biological assets. Both these companies used the cost-based model to value their bearer livestock and one company indicated that it had used the historical cost model to value its consumable livestock. None of the companies that had bearer plants or multi-annual or short-term consumable plants used a cost-based valuation model.

While both companies provided some of the additional disclosures required by IAS 41 when fair value is not used, neither disclosed the gross carrying amount or showed how they reached the carrying value from the estimated or actual costs. Nor did either of these companies disclose separately any gains or losses on disposal of these assets or provide users with a range of fair value estimates.

4.6 Voluntary disclosure of biological assets

Voluntary disclosures have been shown by recent research to increase an entity's access to liquidity, and to reduce information asymmetries between shareholders, analysts, potential investors, lenders and management (Armstrong, Barth, Jagonlinzer & Riedl, 2014). For these reasons, the extent of additional voluntary disclosures provided by companies in their annual financial statements was considered to be worth researching as part of this study.

In addition to the compulsory disclosures for biological assets, IAS 41 also contains a number of suggested voluntary disclosures for companies engaged in agricultural activities. The results of the analysis of the voluntary disclosures are summarised in TABLE 7.

TABLE 7: Voluntary disclosures recommended in IAS 41

	<i>Total (%)</i>	<i>Plants (%)</i>	<i>Livestock (%)</i>
A quantified description of each group of biological assets (IASB, 2010a: par. 43).	75	78	71
A quantified description of each group of biological assets, distinguishing between consumable and bearer biological assets or between mature and immature biological assets (IASB, 2010a: par. 43).	69	78	57
Disclosure of the basis for the distinction between consumable and bearer biological assets and between mature and immature biological assets (IASB, 2010a: par. 43).	69	78	57
Separate disclosure per group of biological assets of the amount of change in fair value less estimated point-of-sale costs included in profit or loss attributable to physical changes (IASB, 2010a: par. 51).	38	44	29
Separate disclosure per group of biological assets of the amount of change in fair value less estimated point-of-sale costs included in profit or loss due to price changes (IASB, 2010a: par. 51).	38	44	29
Mean of voluntary disclosures recommended in IAS 41	58	64	49

Source: Authors' analysis

In general, companies did not provide users with significant additional voluntary information relating to their biological assets. Of the companies analysed, 75% provided a quantified description of each group of biological assets. In total, 69% provided users with a quantified description of each group of biological assets, distinguishing between consumable and bearer biological assets, or between mature and immature biological assets and disclosed the basis for distinguishing between consumable and bearer biological assets and between mature and immature biological assets. However, only 38% of the companies analysed gave a breakdown of the fair value changes, distinguishing between changes due to physical changes, changes due to price changes and changes due to foreign exchange rate fluctuations where applicable.

Once again, companies that had plants as biological assets provided more disclosure information than companies with livestock. Companies with plants had an overall compliance with the voluntary disclosures in IAS 41 of 64% compared to 49% by companies with livestock.

4.7 Discussion of results

The results of the research conducted on the sixteen companies that formed part of this study confirm that South African companies with material holdings of bearer and consumable plants

are more committed to producing annual financial statements that comply with International Financial Reporting Standards and contain information that is useful to users of these financial statements. South African companies with material holdings of bearer and consumable livestock need to take cognisance of the fact that their annual financial statements may not be providing sufficient useful information to enable shareholders, potential investors and other stakeholders to make informed decisions.

This research shows not only that the measurement methods used by companies to value their biological assets, but also the nature and extent of both compulsory and voluntary disclosures of these assets are sector-specific. This is consistent with the findings of previous international research (Clavano, 2014; Dowling & Godfrey, 2001), indicating that preferences for a particular measurement method are sector-specific.

The first issue identified as requiring to be addressed in relation to the research objective was the extent to which South African public agricultural companies are applying the fair value requirements of IAS 41 to the valuation of their biological assets and agricultural produce at the end of each reporting period. The analysis of the research results leads to the conclusion that there are distinct differences between the methods used by companies with material holdings of plants and livestock to measure their biological assets.

While all companies with material holdings of plants are using a fair value measurement method to value their biological assets, the specific methods used varied. All the companies with bearer plants used discounted future cash flows to value these assets, while 80% of companies with multi-annual consumable plants and 83% of companies with short-term consumable plants used this method.

Companies with livestock that did use a fair value method selected different valuation methods for their bearer and consumable livestock. While the preferred method of valuation used by companies with bearer livestock was cost less accumulated depreciation and impairment, companies with consumable livestock used a combination of adjusted market price, sector benchmarks and industry data to value their livestock.

The research findings show that companies with plants selected different methods of valuation for their bearer and consumable plants. This was also true for companies with both bearer and consumable livestock. This point was identified in recent research by Huffman (2013), whose findings support the importance of linking asset valuation to the way in which the asset generates value. Huffman's findings also support the recent amendments to the Conceptual Framework, which favour linking the selection of a particular measurement basis for an asset to the way in which the asset contributes to future cash flows (IASB, 2013b).

While 88% of companies said that they measured their agricultural produce at point of harvest at fair value less estimated point-of-sale costs, the majority of these companies are not providing any further information on the valuation techniques or methods used to value their agricultural produce. It is recommended that South African agricultural companies provide users with more detail concerning the valuation of their agricultural produce.

A comparison of the research results with the specific issues relating to the disclosure by companies of their biological assets and agricultural produce in their annual financial statements shows that compliance with the compulsory disclosure requirements of IAS 41 is high among companies using fair value to value their biological assets. Within this group, companies with plants had higher compliance compared to those with livestock.

Compliance of companies with the compulsory IAS 41 disclosures relating to their agricultural produce was low, with very little difference between companies with plants and those with livestock. In addition, compliance with the compulsory disclosures listed in IAS 41 for companies that used the historical cost model to value their biological assets was low and limited to only three of the required disclosures.

Most South African companies with material holdings of plants or livestock are providing some of the voluntary disclosures recommended in IAS 41. Companies with material holdings of plants are providing more voluntary information than companies with material holdings of livestock.

5. CONCLUSION

The application of IAS 41 has been fraught with controversy since its inception. There has been significant research on its application to various industries and across different regions and countries. What is clear is that the IASB is committed to the use of fair value as the most effective way of capturing the financial consequences of the processes of biological transformation. The application of the compulsory disclosures in IAS 41 as well as the use of any additional voluntary disclosures by agricultural entities may prove costly, but also offers agricultural entities and those who rely on their financial reporting more relevant and more reliable information.

While there has been significant research on the application of IAS 41 to various entities across different geo-political areas, the only study to date which included any South African companies was one conducted by PWC (2011) on large companies in the timber industry in different regions globally, which included four South African public companies. This study therefore contributes to the existing literature by providing information and analysis concerning the reporting practices of a much broader sample of South African agricultural companies.

Companies in the timber and plantations industry have argued that their trees are mostly multi-annual consumable biological assets and that there can be a period of a hundred years from the planting to the felling of these trees (Svensson, Nylén & Gunnevik, 2008). This has a direct impact on the DCF valuations obtained for the standing timber, significantly lowering these valuations. They argue that taking the value of the land plus the standing timber and then subtracting the value of the land alone would provide a more market-related basis for the valuation of these forestry assets. This method is now incorporated in IFRS 13 as the residual method. It will be interesting to see, in the future, how many companies will change to this method of valuing consumable biological assets that have a long period from gestation to their realisation as agricultural produce.

While the IASB seems committed to the use of fair value accounting to reflect the unique characteristics of biological transformation, the impact of recognising all fair value gains or losses in the statement of profit or loss in the period in which they occur seems to require further attention from the standard-setters. The recent removal of bearer plants from the scope of IAS 41 and their inclusion in IAS 16 (IASB, 2013a) will assist entities with multi-annual bearer plantations, but it still leaves entities with multi-annual consumable plantations needing to use a complex, expensive and, in their opinion, less-than-reliable DCF valuation method to value their standing timber, which in turn results in a dramatic increase in earnings volatility in their annual financial statements.

There is also a need for further research on agricultural entities in developing economies in Africa and further abroad. In many developing economies, agriculture provides the majority of the

population with a livelihood and is a significant contributor to the annual national gross domestic product (Cojocaru & Bostan, 2013). Existing literature discusses the problems associated with the increased costs of obtaining fair values for biological assets under financially constrained circumstances (Fisher, 2012; Maina & Wingard, 2013) and the difficulties of applying the requirements of IAS 41 in developing economies (Argilés & Slof, 2001; Elad, 2004). The majority of agricultural entities in South Africa are small family-owned farms. An analysis of the valuation methods used by these entities and the extent of their compliance with either full IFRS or IFRS for SMEs would be informative and would contribute significantly to the existing literature.

Another question which remains to be addressed is whether the recent amendments to IAS 41 and the introduction of IFRS 13 will succeed in reducing the diversity of accounting methods applied to biological assets, and so overcome major concerns relating to the application of IAS 41 as highlighted in previous research, and whether these changes will lead to financial statements that reflect an increase in the fundamental qualitative characteristics of relevance and faithful representation (IASB, 2010b).

Finally, the provisions of IAS 41 for compulsory and voluntary disclosures, as well as previous research conducted by PWC (2011) and Goncalves and Lopes (2014a & 2014b), indicate the usefulness of an overall company disclosure index as a research tool. This study could be extended by applying an overall disclosure index which could be used as a proxy for the quality of disclosure (Beattie, 2004) or to identify any significant correlations between the extent of disclosures of biological assets and other variables such as firm size, industry, listing status, biological asset intensity, shareholder demographics or ownership concentration (Goncalves & Lopes, 2014a & 2014b).

It is hoped that the present study will contribute to the existing literature by providing an analytic framework and a baseline on the financial reporting of agricultural entities in South Africa prior to the implementation of IFRS 13. It is also hoped that this study will contribute to further research which may lead to improved financial reporting by agricultural entities in South Africa and, perhaps, elsewhere in Africa.

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