Adoption of Agri-Eco-Innovations in the South African Apple Industry

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Abstract:

Since the deregulation in 2004, the Apple fruit production in South Africa (SA) predominantly relies on its ability to produce innovative responses to the climatic changes, changing market demand and production technologies. Producers adopt various Integrated Pest Management practices (IPM) and Environmental labels (Eco-labels) to specifically benefit the natural environment, increase production efficiency and achieve sustainable competitive advantage. Yet, there is still no empirical evidence pertaining to the joint effects of the IPM and Eco-labels on farms` productive efficiency and business performance. Accordingly, our hypothesis is based on the complementary assets theory and posits that complementary resources required to capture the benefits associated with a strategy, technology, or innovation as firms often bundle certain strategic resources to outperform others. Hence, we conceptualise the IPM and eco-labels as bundles of complementary resources that firms adopt to achieve these objectives. This paper analyses whether the performance effects of these complementary resources can be enhanced by two-way complementarity between them. The analyses based on a self-administered socio-economic survey collected with 50 apple fruit producers in the Elgin, Grabouw, Villiersdorp and Vyeboom regions of SA. We used the Ordinary Least Square method to estimate the impact of complementary sources on a farm`s Labour productivity, Land productivity and Production growth. Our preliminary analysis based on generic measures of IPM intensity and Eco-label adoption. The results of this preliminary analysis posit that a complementary relationship exists between the IPM and Eco-labels. This complementarity increases farms` Production growth and Land productivity but has no significant impact on farms` Labour productivity when compared to farms adopted them singularly, or none of them. Our second analysis adopts more refined measures of IPM intensity, which is based on the number of different IPM practices that a farm adopted. Accordingly, we investigated the complementarity between Low, Medium and High IPM intensity, and Eco-labels in order to investigate whether the Eco-labels complements different IPM intensities rather than a single IPM measure. The results of these analysis indicate that the complementarity between `Low-IPM intensity and Eco-labels` decreases farms` Labour productivity, Land productivity and Production growth, whereas the complementarity between `Medium-IPM intensity and Eco-labels` tends to increase farms` Labour productivity and Land productivity but has no significant impact on Production growth when compared to farms adopted them singularly, or none of them. Finally, we also found that the complementarity between `High-IPM intensity

and Eco-labels` increases farms` Land productivity but has no significant impact on farms` Labour productivity and Production growth when compared to farms adopted them singularly, or none of them.

Keywords: Integrated Pest Management, Environmental Labels, Eco-innovation, Complementarity, Farm Performance, Apple, South Africa

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