

Interactive comment on “Water-use dynamics of an alien invaded riparian forest within the mediteranean climate zone of the Western Cape, South Africa” by Bruce C. Scott-Shaw et al.

Anonymous Referee #2

Received and published: 16 March 2017

General comments

This paper is a valuable contribution towards understanding differences in transpiration between indigenous and alien invasive tree species in South African riparian zones. The importance of this knowledge in justifying the huge Working for Water programme is highlighted. I feel that one or two additional references are worth mentioning in the introduction. The paper by Cullis, Gorgens and Marais (2005) is relevant to this paper, as it estimates just how seriously invasive trees in riparian zones can reduce stream-flows on a national scale. The papers by Scott et al (1994) and Scott and Lesch (1996) on the influence of trees in riparian zones within experimental catchments should also be referred to.

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There are regular spelling, punctuation and grammatical errors throughout the paper. Please use a spell-checker and grammar checker in future to ensure that these do not get as far as the reviewers. We should be concentrating more on the content rather than pointing out these writing errors which are easy for the authors to detect and correct.

Specific comments

There was no reference to intermittent adjustments of probe depths to account for radial stem growth. Trees tend to grow past the probes, gradually positioning the TCs deeper in the sapwood, or even into the heartwood. I would expect that a species like *A. mearnsii* would grow substantially even over a period of 6 months or one year.

As is usual with sap flow studies, available equipment constrains the number of sample trees. Perhaps the authors would like to suggest how sampling intensity can be improved in future studies? If some of the trees were monitored for three years, maybe one could reduce this to one year, and then sample additional trees for each succeeding year?

I suggest that under "The study area", the mapped vegetation types be given, and a reference to Mucina and Rutherford added. Much more floristic and environmental information is then available to the reader.

The list of references needs some careful checking to ensure consistent formatting. 16 formatting errors picked up!

Technical corrections

P1, L26: Suggest using sap flow rather than water-use. Could be helpful since many readers will not know what the heat ratio method measures.

P1, L41: A hydrological gain could describe an increase in ET. The term is too general, better to say a gain in streamflow?

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P2, L9: Hybrid genotypes are most common in Eucalyptus plantations, but they are mostly not invasive.

P2, L20. This sentence is far too long and clumsy.

P2, 42: Surely temporal flow patterns as well?

P2, L46: Buffeljags River and river seen in the text. Be consistent.

P3, L11: ...which is characterized by

P3, L19: spelling. occurs

P3, L22: Podocarpus changed to Afrocarpus?

P3, L34. Strictly speaking, Plant area index, since light interception is also by twigs, branches, stems.

P3, L40: Vepris. After first mention, abbreviate to *V. lanceolata*.

P3, L42. Spelling. diameter

P4, L8: insert comma

P4, L32. Check format of units throughout MS. Inconsistent.

P4, L40: ...dendrometer, and canopy height...

P4, L41: I think it would be clearer to refer to aerodynamic fetch rather than reach?

P4, L44: Spelling. indigenous

P4, L46: Is this stem density sph or the wood density of stems?

P4, L47: Not sure if it is worth introducing the term medoid to the readers!

P5, L6: Spelling again. Indigenous

P5, L19: Were observation borehole measurements occasional or continuous. Pity

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that groundwater and root pattern data could not be included.

P5, L29. Spelling. significantly.

P5, L40: ...occasional maximum temperatures exceeded 40oC ?

P6, L33: After first mention, abbreviate to *C. africana*

P7, L3: ...very low, dropping ...

P7, L7: ..and a porosity of 0.42...

P7, L9: 22 hours to get to FC or wilting point? Seems very fast, even for a sand.

P7, L10: Spelling. greater

P7, L18: Throughfall and stem flow are surely not interception storage?

P7, L20: ...indigenous site took much longer ... No comma

P7, L38: ...water use... Be consistent about using a hyphen.

P8, L4: *C. africana*

P8, L28: aerodynamic fetch rather than reach?

P8, L34: ..a stand of introduced *A. mearnsii*... Sounds better than an introduced stand?

P8, L34: ..can annually use up to six

P8, L37: But see Cullin Gorgens and Marais paper which offers some quantified estimates.

P10, L1 onwards: Found 16 formatting errors! Please check carefully.

Table 1. Suggest be consistent in arranging trees from small to large. The first two groups of sample trees have a different sorting order. Moisture fraction is very variable in group 2 (*A. mearnsii*). Do you know why?

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Figure 2. Numbers within bars along the X axis are partly obscured.

Figure 3. Caption says solar radiant density. Y2 axis label says solar radiation. Be consistent. Format of units again variable. The point separating each unit is sometimes in a lower or middle position. Check throughout the manuscript.

Figure 4: ...lower reach alien stand... Consider referring consistently to *A. mearnsii* rather than alien stands.

Figure 7. Pity no water table trends shown!

Table 2. Thousands separated by blank spaces here, but not consistently through the paper. Check throughout.

Figure 8. I think Et in the legend should be Et0 ? Again, introduced stand might be better described as *A. mearnsii*?

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