In this manuscript, the authors compared the difference in water and gas fluxes for three different water treatments and two soil types using coupled water balance - root water uptake - root growth - crop growth and assimilation models. The simulations were compared with and without considering dynamic plant hydraulics using literature data, and were evaluated by sap flow measurements. It's not usual that crop growth, root growth, assimilation rate, and water uptake models were coupled for modeling water and gas fluxes. The manuscript included a lot of work, especially on the model coupling. The limitations of the coupled models were also discussed. In principle, this manuscript is well-written and the story is interesting. I have a few questions and suggestions (minor revision) that I offer in the spirit of improving clarity and message.

Abstract: there were several models mentioned in the abstract, which makes readers confusing for the first impression. To make it clear, I suggest to use the name that the author described in section 2.3.5: HILLFLOW–Couvreur–SLIMROOT–LINTULCC2 for the newly coupled model and HILLFLOW–Feddes–SLIMROOT–LINTULCC2 for the commonly approach at line 18.

Introduction: The author wanted to simulate the water and gas fluxes for different water and soil conditions considering dynamic plant hydraulics. The importance of dynamic plant hydraulics was well presented. Dynamic plant hydraulics related to root growth so root development was needed. The author used SLIMROOT but did not mention and explain why it was chosen in the introduction.

Methods and materials:

This manuscript described five different models and each of them has different parameters (input and output). It's good that all the parameters and related values were listed in the supplementary materials. These five models were coupled in two different ways and the input or output of the models were used from each other. I suggest the author draw a diagram or flowchart to describe the connection between the models, which will definitely help readers to understand better.

For the root growth model, soil water content and soil temperature were needed for the simulations. It seems that the author used simulated results from two separate models. Why did not the authors use the measured data from the soil sensors for the root growth simulations?

Stomatal conductance (g_s) could also be used for explaining the variation of the transpiration, especially for dry conditions. The reduction in g_s shows water stress. Since these data were available (Appendix A) the variation of g_s and f_{wat} could be related somehow. The author could show and discuss it in the results and discussion part.

Results and discussion: line 479 and this paragraph were a little bit off, especially the comparison between the modern and old cultivars. This part could be either skipped or connected with a better explanation.

Conclusion: the aim of the study, drawback of the models, and further investigations were well presented. The three objectives of the study were posted at the end of the introduction and they were tested in the manuscript but not all of them were mentioned in the conclusion part. Normally, answers should be given in the end.

Here are some other detailed comments and suggestion:

Line 10: the sentence is really long, please rephrase.

Line 22: LAI is not defined before, please give the full name, leaf area index

Line 30: 'promissing' – 'promising'

Line 39: move (RWU) to the former 'root water uptake'. Please also check the usage of 'RWU' and 'root water uptake' in the text below. Once it is described, the abbreviation should be used afterwards.

Line 47: 'in an indirect manner' – 'indirectly'

Line 50: 'models of root water uptake' – 'RWU models'

Line 65: delete 'shoot'

Line 86: missing the 'period' symbol

Line 106: delete 'soil property' since the soils have been described before

Line 110: 'side' – 'sides'

Line 112: 'was' – 'were'

Line 115: 'rain-fed' – 'rainfed' and also check it in the text below

Line 119: … sap flow was calculated …

Line 123: '8pm' – '8 pm'

Line 130 and 131: '6' – 'six'

Line 132: use am (pm) or AM (PM) in the whole text

Line 150: 'above ground' – 'aboveground', and also check it in the text below

Line 151: the detailed measurements of biomass, especially the different organs, were described but not used later. This part could be skipped

Line 162: … model of Farquhar and Caemmer (1982)

Line 165: For the sake of …

Line 167: check the format of the citations in the bracket

Line 171: give the full name of LAI

Line 190: keep 'Hillflow1D' and 'HILLFLOW 1D' the same in the text

Line 229: 'fwat' – 'f_{wat}' and also in Figure 4

Line 323-324: Not clear. It is better to have two different colors or symbols to differentiate the two samples.

Line 325: do you use the mean r2 of the six plots? If so, you need to mention and also re-calculate them. It seems that 0.91 and other values are not the mean of the six values.

Line 343: use 'minirhizotube' or 'rhizotube' in the text and in the caption of the figures

Line 363: … show the simulated …, by the …' – '… show …, simulated by …'

Line 407: 'Pg' is not defined

Line 463: 'increases' – 'increase'

Line 477: 'is' – 'are'

Figure 2, Line 879: 'green' – 'cyan' (used in Figure 2 and 4)

Figure 4: make the size of the four subplots (a, b, c, d) the same for better comparison

Figure 4, line 934: Pg? Please give the full name

Appendix F: bar plot will be better for the comparison