LIST OF CHANGES

**Reviewers' comments:**  
  
**Editorial comments:**  
  
1) All of your previous revisions have been incorporated into the most recent version of the manuscript. Please download this version of the Microsoft word document from the "file inventory" to use for any subsequent changes. Revisions were made to file JoVE51664\_R1\_JC. Revised file was renamed JoVE51664\_R2\_RB.  
  
2) Please disregard the comment below if all of your figures are original. All figures are original.  
If you are re-using figures from a previous publication, you must obtain explicit permission to re-use the figure from the previous publisher (this can be in the form of a letter from an editor or a link to the editorial policies that allows you to re-publish the figure). Please upload the text of the re-print permission (may be copied and pasted from an email/website) as a Word document to the Editorial Manager site in the "Supplemental files (as requested by JoVE)" section. Please also cite the figure appropriately in the figure legend, i.e. "This figure has been modified from [citation]."   
  
3) Please take this opportunity to thoroughly proofread your manuscript to ensure that there are no spelling or grammar issues. Your JoVE editor will not copy-edit your manuscript and any errors in your submitted revision may be present in the published version. Manuscript was proofread. Edits were made at lines 162, 186 and 414 to correct numerical, grammatical and spelling mistakes that the reviewers did not catch.  
  
**Reviewer #1:**   
*Manuscript Summary:*   
The manuscript is exceptionally well written, a delight to read. Very detailed, very thorough. Great use of schematic diagrams and figures.  
\* Are the title and abstract appropriate for this methods article? Yes  
\* Are there any other potential applications for the method/protocol the authors could discuss? No  
\* Are all the materials and equipment needed listed in the table? (Please note that any basic materials or equipment that a lab who might use this protocol would already have do not need to be listed, e.g., pipettes.) Very well listed.  
\* Do you think the steps listed in the procedure would lead to the described outcome? Yes  
\* Are the steps listed in the procedure clearly explained? Extremely well  
\* Are any important steps missing from the procedure? None  
\* Are appropriate controls suggested? Yes cautions are well identified, along with rationale.  
\* Are all the critical steps highlighted? Yes  
\* Is there any additional information that would be useful to include? No  
\* Are the anticipated results reasonable, and if so, are they useful to readers? Extremely  
\* Are any important references missing and are the included references useful? No and yes.  
  
*Major Concerns:*  
Two global comments:  
(a) The authors have used the word 'variance' numerous times; I think mostly incorrectly or inappropriately. I think the more general term 'variation' is what they mean, and thus should use. I have pointed out these instances in the manuscript. All occurrences of variance were changed to variation. This comment caused us to reevaluate our calculation of the coefficient of variation (CV). Changes were made to correct that discussion throughout the manuscript.  
(b) The convention I know is for the dependent variable to be stated first followed by the independent variable. For instance, Runoff volume is related to antecedent moisture content. Not the other way round as the authors have stated numerous times. Numerous instances of such misuse (in my opinion) occur in the manuscript. Changes were made throughout the discussion section of the manuscript to conform with the recommended convention. Statements in the figure captions do conform to this convention.  
  
*Minor Concerns:*  
  
Because rainfall  
79 simulators are designed to deliver raindrops of similar size and velocity as natural rainfall,  
80 studies conducted under a standardized protocol can yield valuable data that, in turn, can be used  
81 to develop models for predicting the fate and transport of pollutants in runoff. The part before the comma represents our wishful thinking as researchers. That point re rainfall is not necessary for the latter part of the sentence to be true.  
  
85 in light of the uncertainties of global change. Is climate change meant? Global change is a broader term that refers to planetary-scale changes in the Earth system and encompasses the water cycle, the carbon cycle, the nitrogen cycle and other cycles. We think the term global change is more appropriate to our meaning.  
  
102 Due to the unpredictability of natural rainfall, Variability is likely a better word than unpredictability.

We agree and changed the word.  
  
107 constituents in runoff. When comparisons are made between natural rainfall and rainfall  
108 simulation data, trends follow a similar pattern, pointing to a consistency in processes.  
Perhaps reword to Trends between natural rainfall and rainfall simulation data follow a similar pattern, pointing to a consistency in processes. Sentence was reworded as suggested.  
A reference or a few for this point (similar trend between rainfall and rainfall simulation) would be valuable as it is a key point.  
  
114 Kentucky rainfall simulator, which covers a plot 14.75 feet by 72 feet (4.5 meters by 22 meters) Revise to (4.5 m by 22 m) SI units are never spelled out (don't think feet are either) Changed both units to abbreviations.  
  
118 community of scientists from 11 participating countries concluded that a standardization of  
119 rainfall simulation and simulators is needed....It seems like some statement from the authors at the end of line 120 as to what contribution their study makes to this great cause would be valuable. Sentence was added as suggested.  
  
147 150 top five cm of the surface. More correctly top 5 cm of the surface Corrected  
162 165 results of the 6 samples have a coefficient of variance (CV) The authors mean coefficient of variation. Extensive edits to coefficient of variation discussions were made throughout.  
171 174 and depth (100 cm x 20 cm x 7.5 cm) with nine 5mm drain holes in the bottom. Put a hyphen between 5 and mm Corrected  
  
267 271 use (Table 1). Note: The 10 second flow volume is the most accurate measure for properly  
268 calibrating the nozzle. That is a very short time period, why is it the most accurate? And what other volumes were used? Sentence was corrected to say that “For properly calibrating the nozzle, the 10 second flow volume is a more accurate measure than the reading on the flow meter.”  
  
277 282 7.7) Measure the volume of water (ml) use mL instead to avoid confusion with the number 1 corrected  
  
281 286 7.8) Calculate the coefficient of variance see note above Corrected  
324 330 runoff. This order of magnitude variance.... again maybe variation in a general sense rather than variance? Corrected  
330 336 In order to investigate the cause for such extreme variance, see immediately preceding comment...also is the extreme variance referring to the values given in line 323? Perhaps state such extreme variation in what...Clarified  
332 338 to minimize variance in physical conditions. Ditto re variance  
Corrected  
332 338 to minimize variance in physical conditions. To achieve 50, 60, 70, 80, 90, and 100 % of field  
333 339 capacity, the weight of water required to wet the soil to corresponding antecedent soil moistures  
334 340 of 14, 17, 19, 22, 25 and 27 % was calculated, added to the boxes, and allowed to equilibrate  
335 341 overnight.   
These values are highly soil texture specific. The authors have not mentioned what soil texture they were using, undoubtedly the greatest factor of all affecting infiltration. Soil texture was added on line 338.  
  
333 340 how was field capacity determined? Give a reference or explain. Explanation was provided.  
  
337 344 intensity of 3.2 cm hr-1 over a 40 minute period. How were these two critical parameters chosen? Explanation provided.  
  
340 348 Table 2. There was a significant positive relationship between antecedent moisture condition and  
341 349 total runoff volume (Figure 6).   
Total runoff volume depends on antecedent moisture condition, not the other way round. So the relationship is between total runoff volume and antecedent moisture conditions (dependent variable given first). Changed to conform with this convention throughout the manuscript.  
  
341 total runoff volume (Figure 6). Wetter soils had less capacity to store water resulting in greater  
342 351 runoff volumes.   
Technically true but not actually. The issue isn't really storage. Wet soils have lower infiltration rates than dry soil do...that is why there is greater total runoff volume under wet soils than dry ones. Water not infiltrated runs off. Sentence was edited to say both: less capacity to store water and lower infiltration rate.  
  
342 352 runoff volumes. There was a significant negative relationship between antecedent moisture  
343 353 condition and time to runoff (Figure 7). Water infiltrated into drier soils for a longer period of  
344 354 time before they became wet near the surface, causing runoff to occur. Not surprisingly, there  
345 355 was a positive relationship between total runoff volume and total load urea-N in runoff   
Two more instances where the variable order needs to be reversed...give the dependent ones first  
Changed to conform with this convention throughout the manuscript.  
  
364 375 runoff is longer and urea-N concentrations in runoff are lower for drier soils. Worth mentioning what the trend in loads was? Yes, sentence was modified to include effects on load.  
  
458 470 all boxes, consider grouping replicate treatments within individual runs to minimize variance  
again variation might be a better word Corrected  
  
I Suggest that authors consider the extensive review referenced by Grismer, rather than the abbreviated summary in Cal Ag. We did locate a 110 page report that was presented at TSC Rainsim workshop 4 March 2011. However, that was labeled draft, and we considered it to be gray literature. Grismer does not reference that report in his Cal Ag paper. It appears that Grismer considers the Cal Ag peer-reviewed paper to be his published work, so we choose to cite the Cal Ag paper.

*Additional Comments to Authors:*  
Fabulous job!  
Thank you for your very helpful and constructive comments.  
  
**Reviewer #2:**   
*Manuscript Summary:*   
N/A  
  
*Major Concerns:*  
The paper format is unusual for me and appears to be an operations manual, rather than a research paper. However, the methods, results and the like are clearly outlined as a result. This is a function of the journal format requirements for a paper whose purpose is to describe an experimental method in detail. It is quite different from most reports of a scientific study.

The authors might want to consider the number of other papers that deal with the same matter using greenhouse sandbox RS studies by Kinnel, Lui (1998) and others. My greatest concern in the methods section is the 5 cm soil/sand depth is inadequate and would likely lead to far greater runoff rates than encountered in the field. Although greater soil depth may better approximate field conditions, this depth has been widely accepted as the standard for these studies. The key is that “Trends between natural rainfall and rainfall simulation data follow a similar pattern, pointing to a consistency in processes.” (Line 108)

I appreciate the effort towards developing a standard method as pointed out

And we appreciate the time and effort that both reviewers devoted to the improvement of this manuscript.  
  
*Minor Concerns:*  
N/A  
  
*Additional Comments to Authors:*  
N/A  
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Your revision is due by **Nov 27, 2013**.  
  
To submit a revision, go to the [JoVE submission site](http://www.editorialmanager.com/jove) and log in as an author. You will see a menu item called 'Submission Needing Revision'. You will find your submission record there.   
  
Sincerely,  
  
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