Reviewer comments:    
  
Reviewer #1: Summary: The authors investigate the rotation effect by comparing a short rotation (corn, soy) to an extended rotation (corn, soy, oat-alfalfa, alfalfa). Previous research demonstrated an increase in yield in the extended rotation compared to the short rotation. Differences in resource distribution, microbial activity, and nutrient cycling have previously been observed as well. In this study, the authors focus on maize root growth and its implication on yield. Maize yield is shown to be significantly higher in the extended rotation compared to the short rotation in 5 of the 8 years during this study. Root biomass data suggests maize grown in the extended rotation allocates more roots below 15 cm and increased rooting depth earlier in the season in some years when compared to maize grown in the short rotation. Measurements of soil penetration resistance and soil moisture do not indicate that differences in soil physical properties lead to maize in extended rotation growing more deep roots. The authors suggest that soil biological properties as studied previously may contribute to these differences.  
  
Comments:  
1. The authors do a good job addressing my previous comments and concerns.  
  
2. I believe there is a typo on line 598; the publication year is in parentheses.  
  
  
  
Reviewer #3:  
This manuscript emphasizes that the whole extended rotation was responsible for the yield benefit and depth of root system of maize, rather than one or more specific features of the rotation. There is some acknowledgement that specific drivers may have contributed to the results (L102-105 and L441-445) but only as secondary drivers to the general effects of extended rotation. More emphasis should be given to the possible effects of the specific drivers.  
  
It also emphasizes resource acquisition rather than resource supply (e.g.L381). Could the supply of mineralized N in the subsoil arise from the fine-root residues of alfalfa in the subsoil? If so, the proliferation of maize roots in the subsoil may reflect supply of mineral N that preceded its acquisition. Is there evidence of this in Midwest systems?  
  
How representative are the rotations and yield responses in this manuscript of previous reports? At L92-95, 13 papers report the continuous maize penalty and 3 papers at L101-102 report extended rotations that include small grains and legumes. Both responses are mentioned in 4 papers at L87&88. Rather than just referring to these papers, the authors should present a table showing the actual rotations and their effect on maize yield in the previous studies and in a form comparable with the presentation of their own data e.g. M S O/A A - 8%. Comparing the cropping patterns and yield responses in previous papers with the pattern in the current manuscript could help to identify mechanisms and drivers.  
  
The manuscript refers to extended rotations in many Midwest studies and the (singular) system reported in this manuscript. When reporting and discussing the results the manuscript should refer to the experiment, not the region's extended rotation.  
  
At ~L40, add to the sentence indicating that the extended rotation significantly (P<0.01) outyielded the short rotation in 5 of the 8 years.  
  
The reference to Sawyer and Mallarino. 2017, cited in Table 1 is not available on the web. Related papers report a soil-nitrate sampling depth of 30 cm. Please confirm the sampling depth and report the nitrate concentrations. Are there data from this or related studies on the mineral N amount between the sampling depth and the bottom of the root zone?  
  
Section 3.5: Please indicate whether the measurement of penetration resistance avoided wheel tracks and whether the short-rotation treatments incurred less compaction from vehicle movements than the long-rotation.  
  
Why the difference in experimental seasons between Fig. 1 (6 years) and Fig. S2 (5 years)?  
  
All differences in yield and other properties should be accompanied by a report of statistical significance. This applies specially to the Abstract and Highlights. In parts of the manuscript before the Statistical analysis section the response should be accompanied by a simple indicator such as (P=0.03). Within the Statistical analysis section, add a sentence indicating that responses reported in the paper have e.g. p<0.05.  
  
Fig S7 reports maize yields of 1-2 t/ha. Please correct.