

INTRODUCTION

- Approximately 85% of the alfalfa in New York is sown with perennial grass.
- Alfalfa-grass stands can be heterogeneous, particularly in research plots, making sampling crucial.
- Samples can be separated for individual evaluation of alfalfa and grass nutritive value, but the ratio of alfalfa to grass may not be accurately represented in a small sample.
- Digital imaging analysis of photos has been able to successfully estimate alfalfa:grass ratio, but this technique is not as effective with grasses that are heading.

OBJECTIVES

- Our objective was to evaluate whether visual photo evaluation can effectively estimate the alfalfa:grass species ratio in mixed stands.

MATERIALS AND METHODS

- In spring and early summer of 2015 we acquired samples (n=207) of alfalfa-grass stands in farmers' fields, and determined alfalfa and grass dry matter proportions for each sample.



Figure 1. Alfalfa-Grass separation

- A camera was used to capture a digital image (5-Megapixels) of the sampling area.

MATERIALS AND METHODS

- Representative samples were selected and delineated using a round hoop (66-cm diameter), which was rested on the vegetative canopy.

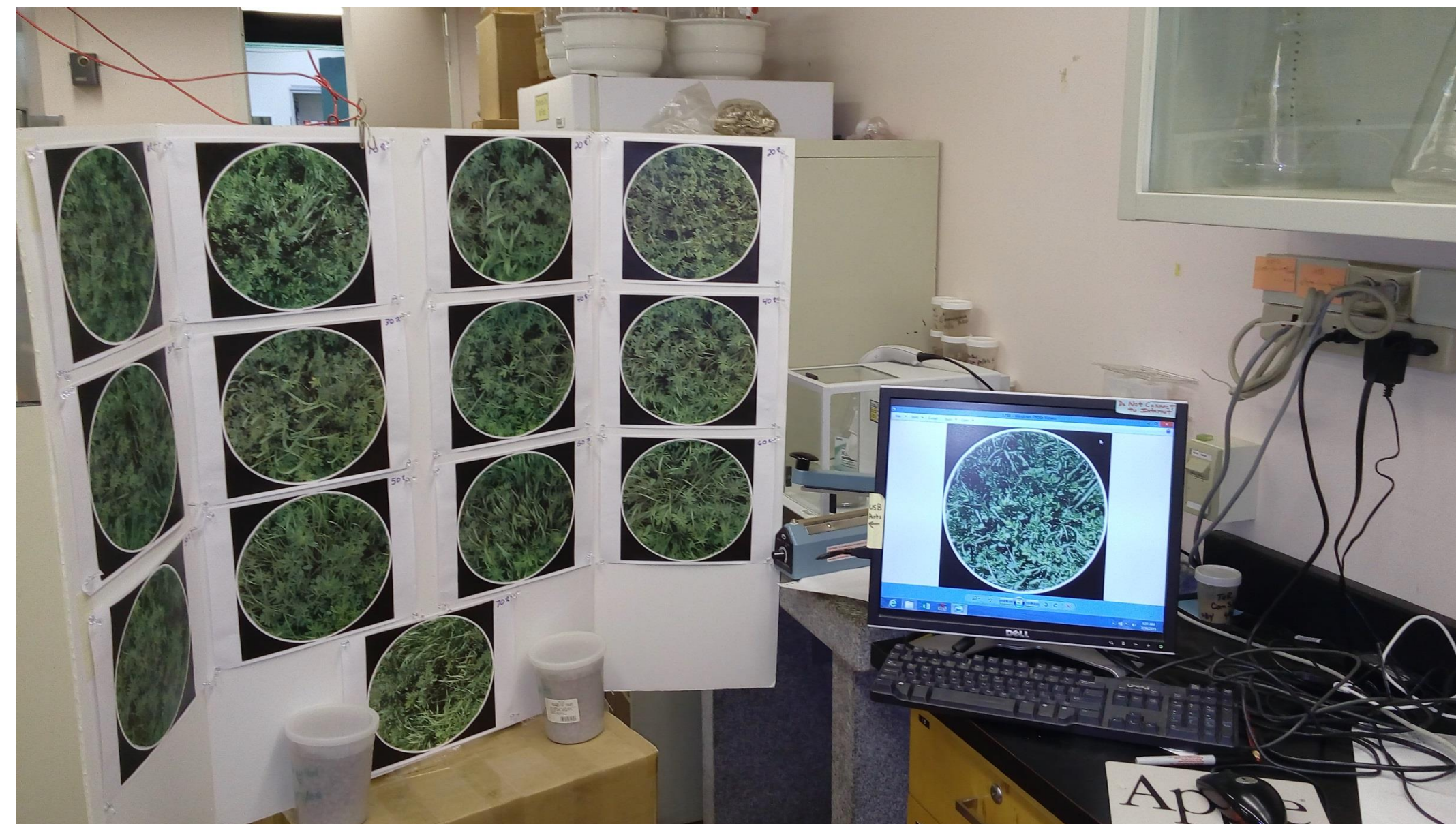


Figure 2. Visual estimation

- Three individuals visually rated photographs for alfalfa percentage, and individual ratings were relatively consistent.
- A set of calibration photographs was identified that covered the range of alfalfa percentage in hand-separated samples, selecting photographs that visually represented a decreasing alfalfa percentage, and also agreed with hand separation results.

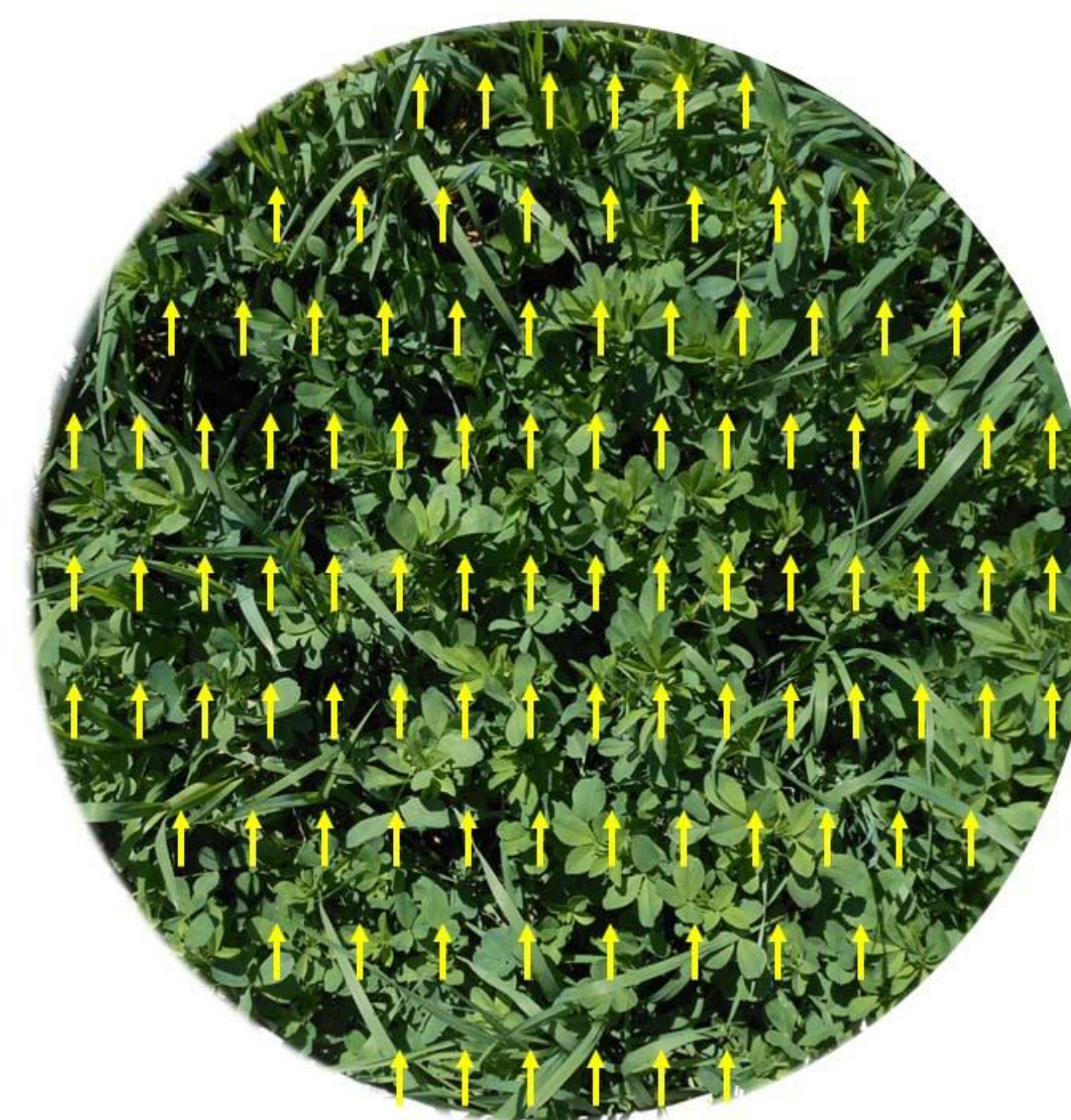


Figure 3. Point-count system

- Two individuals also rated photos using a point-count system. On each photo, 100 random points were categorized as alfalfa, grass or unknown.

RESULTS

- Calibrated visual estimates ($y = 13.3 + 0.833x$; $R^2 = 0.70$) were better than point-count estimates ($y = 18.6 + 0.826x$; $R^2 = 0.61$).
- Both systems tended to overestimate alfalfa when the alfalfa percentage of the stand was low.

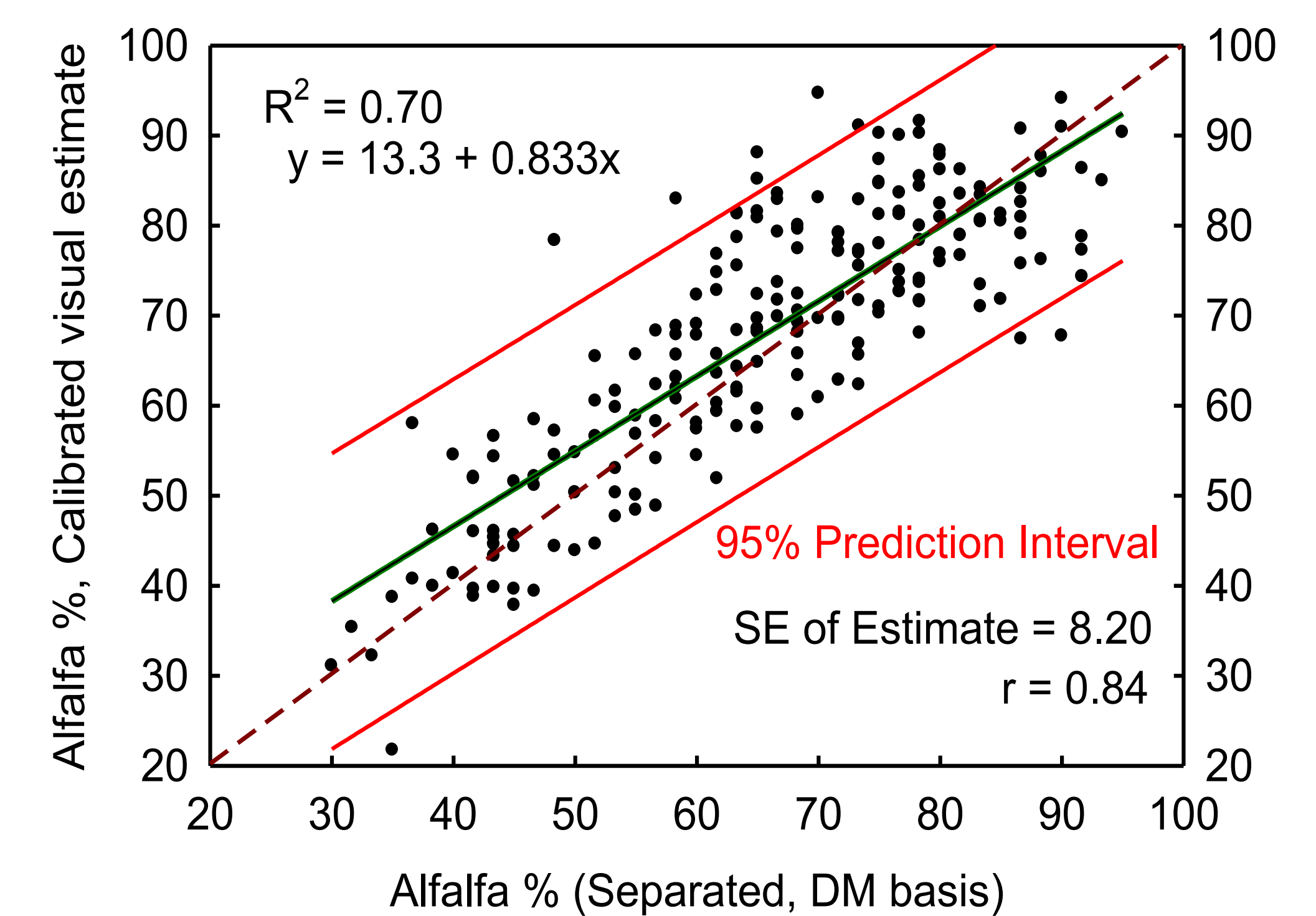


Figure 4. Alfalfa %, Calibrated visual estimate

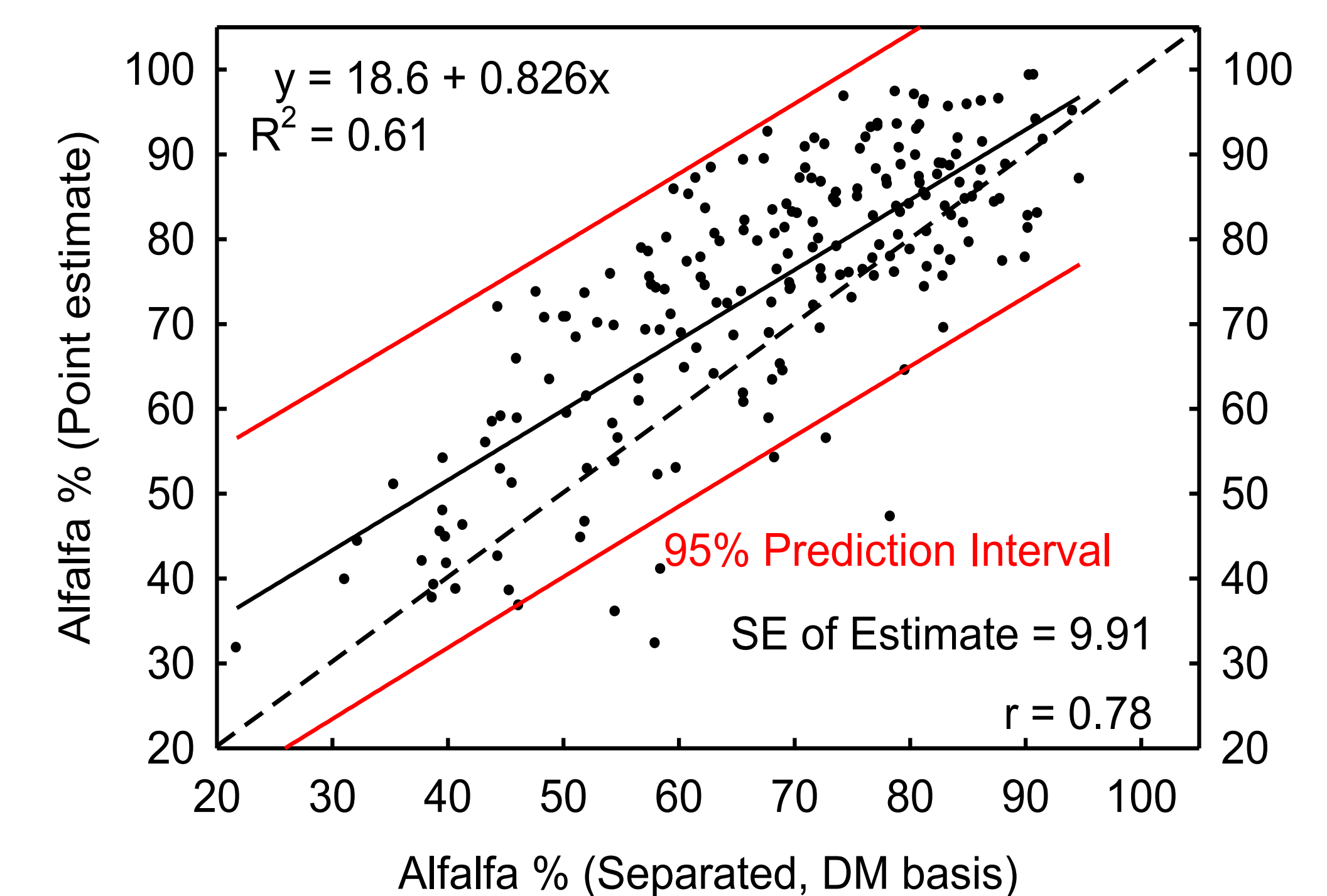


Figure 5. Alfalfa %, Point estimate

CONCLUSIONS

- Visual and point-count estimates were well correlated ($r = 0.88$), with point-count estimates of alfalfa percentage about 10% higher than calibrated visual estimates.

ACKNOWLEDGMENTS/CONTACT INFO

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