

# Evaluation of Pollen Density on Male Inbreds Used in Hybrid Maize Production

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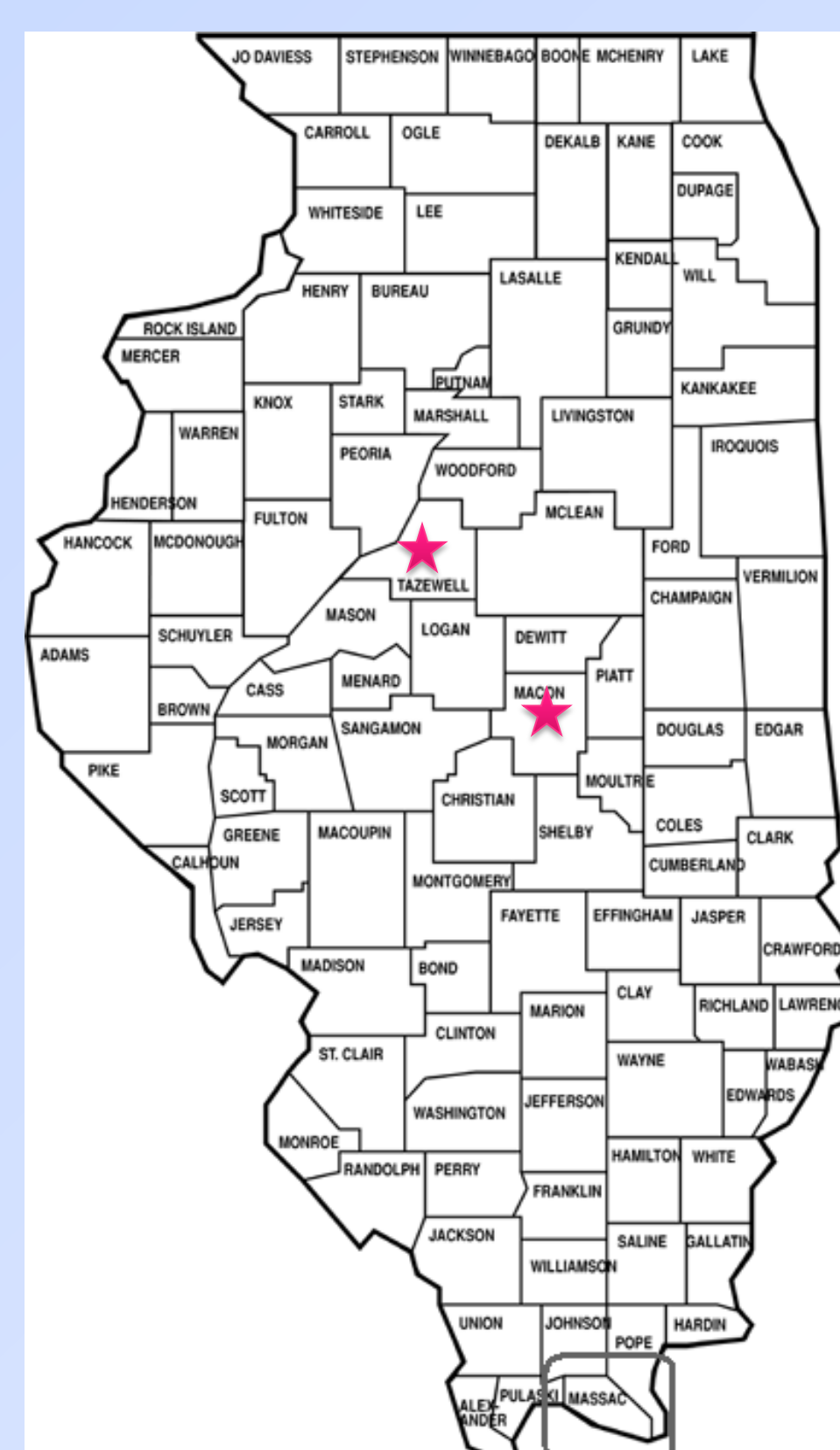
## Introduction

The maize flowering period is a key component in production fields to achieve 100% pollination (fully pollinated ears). My goal was to evaluate the effects of plant density on pollen production in modern male corn inbred genotypes. My objective was to study male inbreds at different planting densities and identification of male corn inbred sensitivity to population dynamics in hybrid corn production operations.



## Methods

This study took place in two locations: Decatur, IL under dry land conditions and Manito, IL under center pivot irrigation. The male density study was evaluated at both locations, while the double plant (delayed planting) was at Decatur. A diverse lineup of male inbred lines were evaluated under 2 different densities (30K & 50K) for the male density study. The double plant study had three densities (30K, 45K, & 60K), but were split in half and planted separately with a 2 inch gap, to see the effect of shading on the tassels and pollen. I focused my data on pollen shed, pollen volume, tassel architecture, and skeletonization.



Delayed plant study was conducted at only Decatur, IL

- Two planting dates- May 28, 2014 & June 2, 2014
- 2<sup>nd</sup> planting was intended to extend pollination period
- Three populations 30,000, 45,000, and 60,000
  - Total population equals 30,000 plants per acre by splitting planting dates for 15,000 and 15,000



Density study was conducted at both locations

- Low density at 30,000 plants per acre
- High density at 60,000 plants per acre



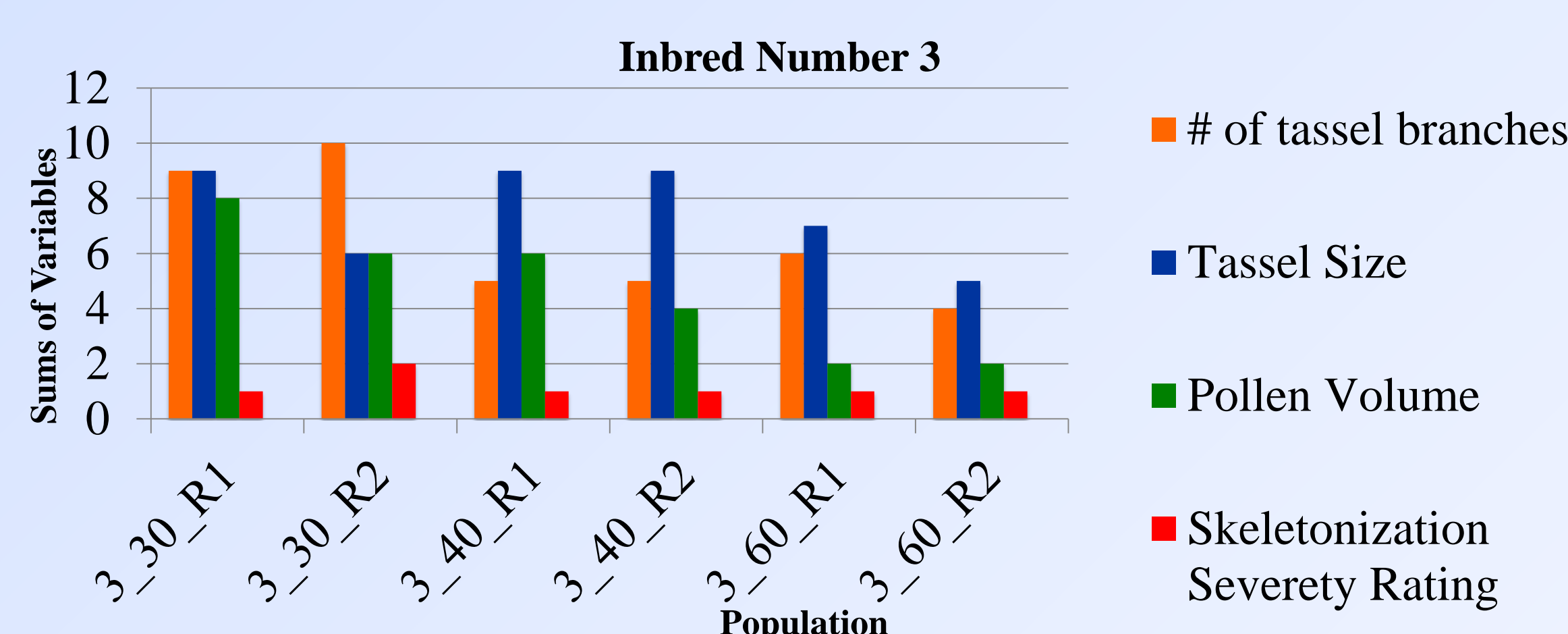
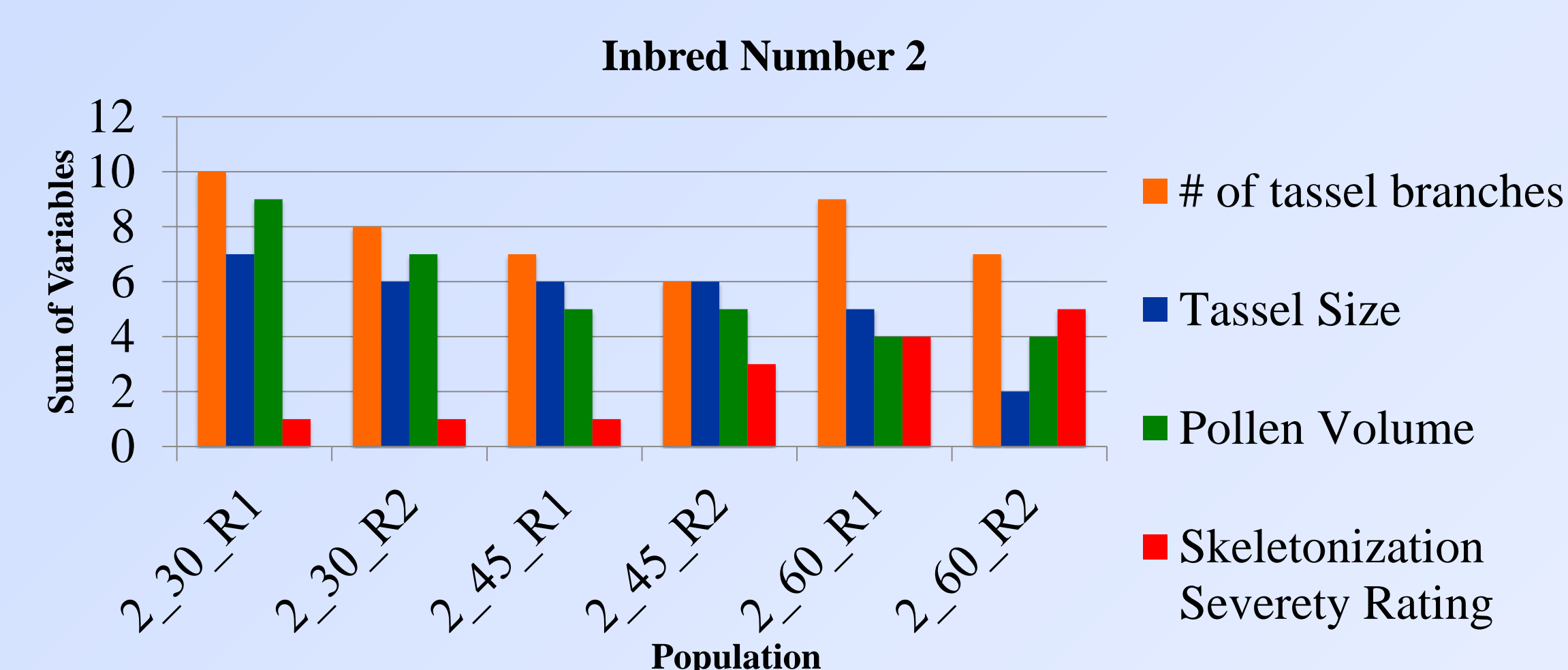
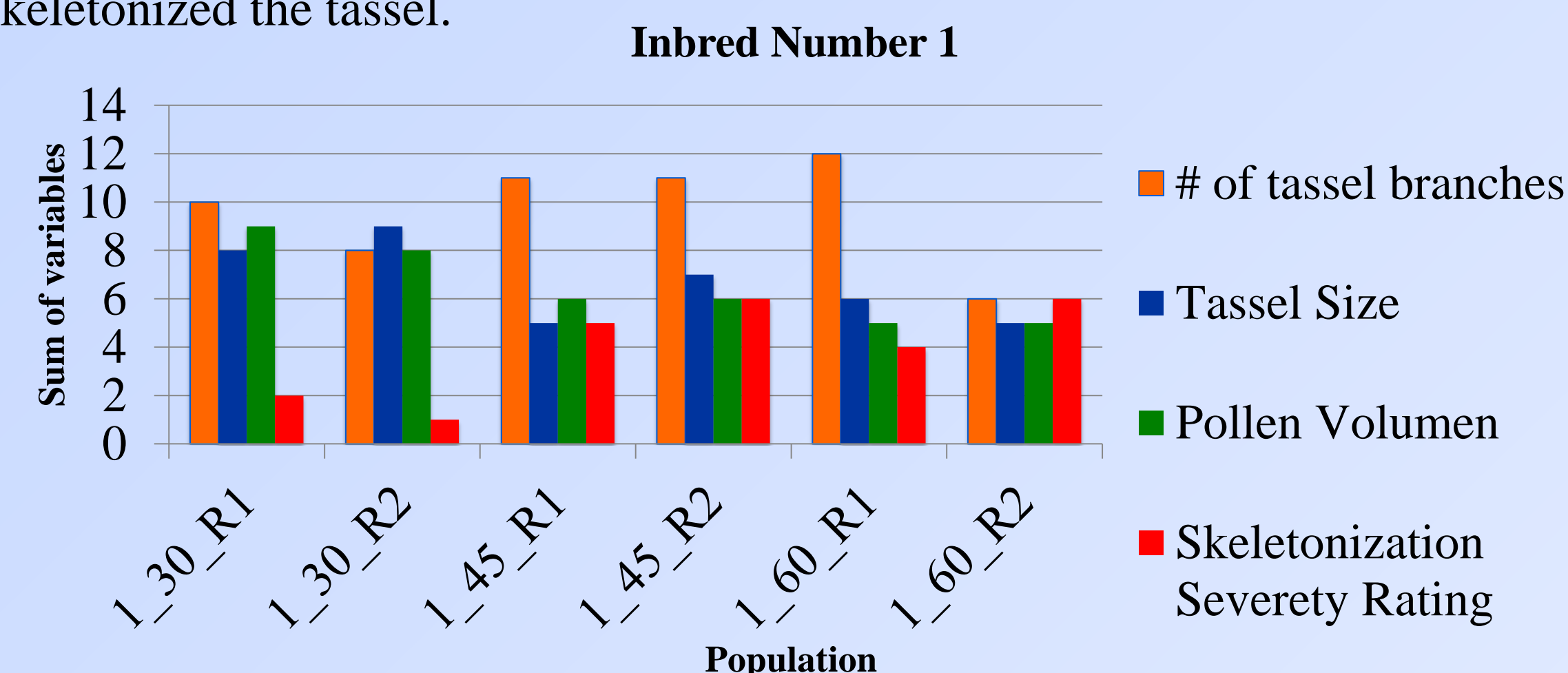
30,000 population



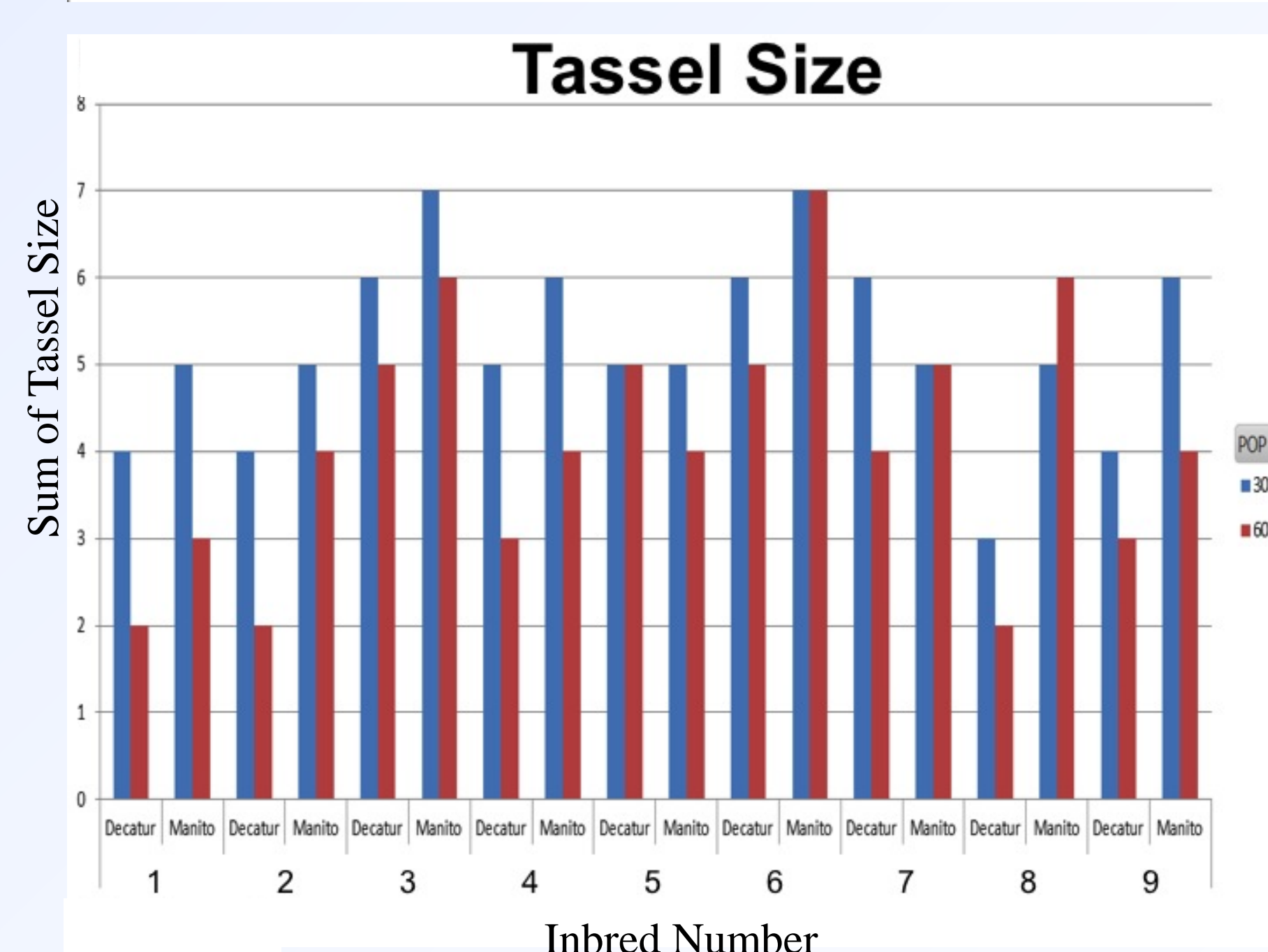
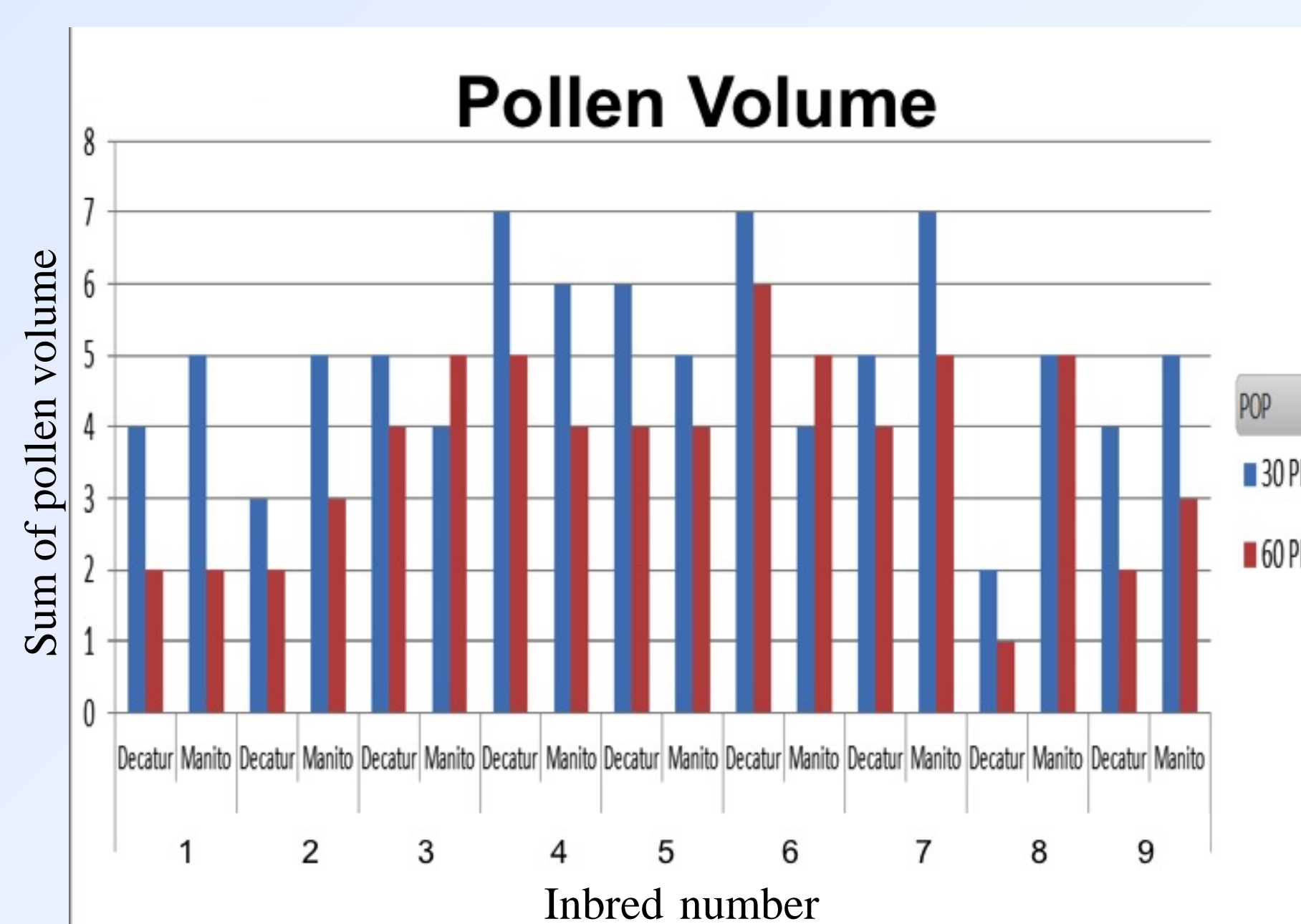
60,000 population

## Results

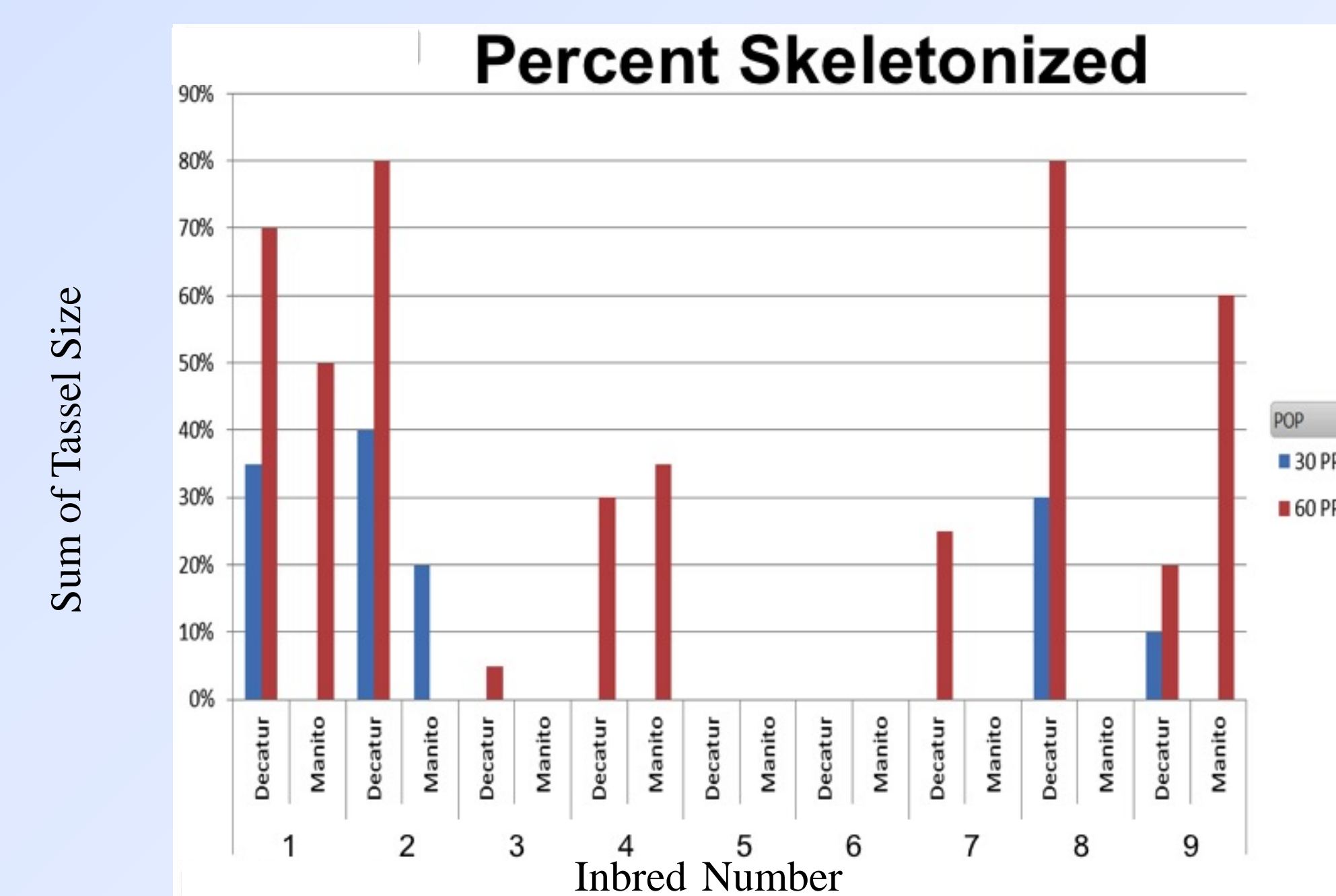
These graphs show one different inbred at 30,000, 45,000, and 60,000 plants per acre by two different replications. Each inbred graph also rates the variables of: the number of tassel branches, tassel size, and pollen volume. The number of tassel branches, size, and volume are rated by size and amount. Skeletonization severity rating was rated on a low scale, the lower the number the less skeletonized the tassel.



These graphs show the amount pollen volume, tassel size, and percent skeletonized for 9 different inbreds at 60,000 and 30,000 population for both locations



## Results (Continued)



## Conclusion

### Delayed Planting

Tassel Size & Pollen volume- As population increased all male density variables decreased  
Percent Skeletonized- Most severe in 60,000 population

Planting dates – The first planting date (R1) in the same inbred shed more pollen than the second planting date (R2)

### Male Density

Manito, IL - Environmental conditions unfavorable  
Decatur, IL - Environmental conditions somewhat favorable

Pollen volume rating - Low density averaged more pollen

Tassel Size - Low density averaged larger size

Skeletonization - Mostly seen in high density

Skeletonization severity - Most severe in high density

Both studies show that as the population increased the pollen production decreased.

The tassel size was larger at the lower population.

Skeletonization and severity rating were more severe in the higher population.

Over all, the graphs show that the greater the density the less pollen shed per individual plant.

Due to overcrowding the higher population did not produce as much pollen to pollinate females in production fields.

## Acknowledgements

