

SCOUT-BASED APPLICATION AND INTEGRATION OF NEMATODE RESISTANT CULTIVARS: AN IPM STRATEGY FOR REDUCING PESTICIDE USE IN TOBACCO IN MALAWI

MsangoSoko K. R., Mainjeni C. E. D.,
Gomonda R. W. J., & Chamango A. M. Z



Presentation Outline

- Introduction
- Objectives
- Materials & Methods
- Results/Discussion
- Conclusion



Introduction

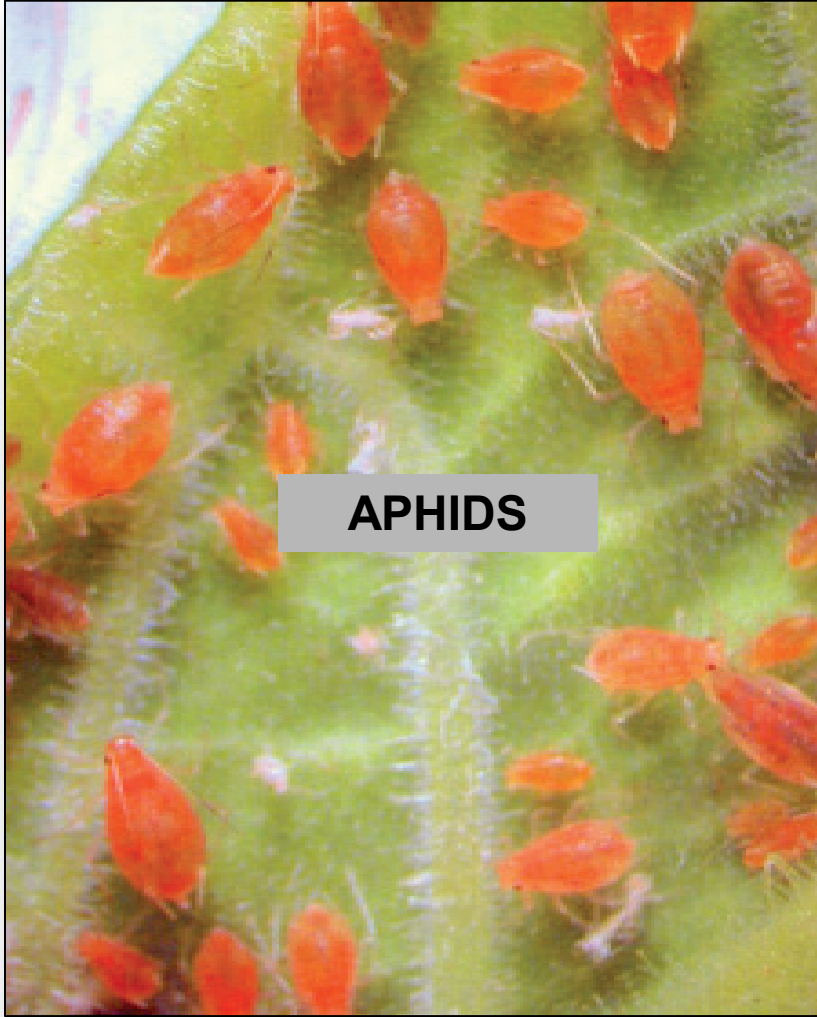
- Tobacco (*Nicotiana tabacum*) production in Malawi is faced by serious biotic constraints that compromise yield and quality



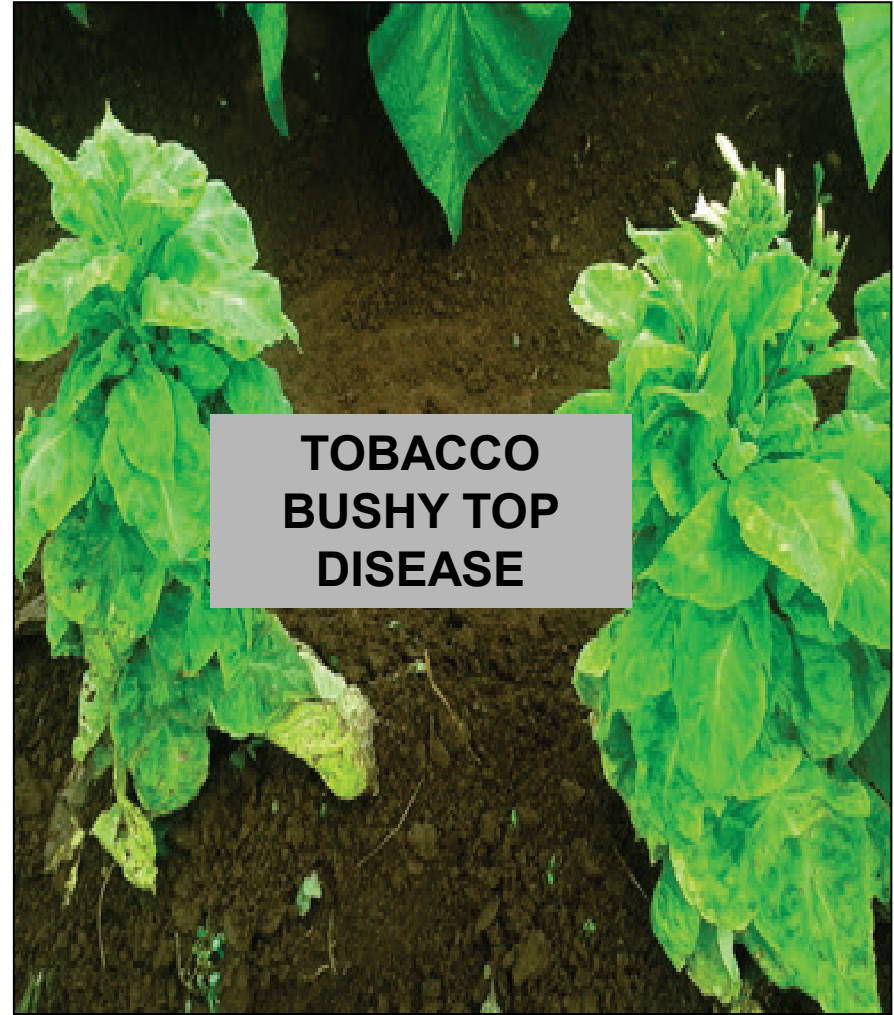


**TOBACCO
BUDWORM**

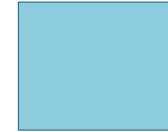




APHIDS



**TOBACCO
BUSHY TOP
DISEASE**





ROOT KNOT NEMATODE



BACTERIAL WILT DISEASE



- Common practice, especially high input farmers is to apply pesticides on routine basis
- Pesticides come with a cost - expensive, off-target effects, chemical residues, environmental issues - raise concerns about their use



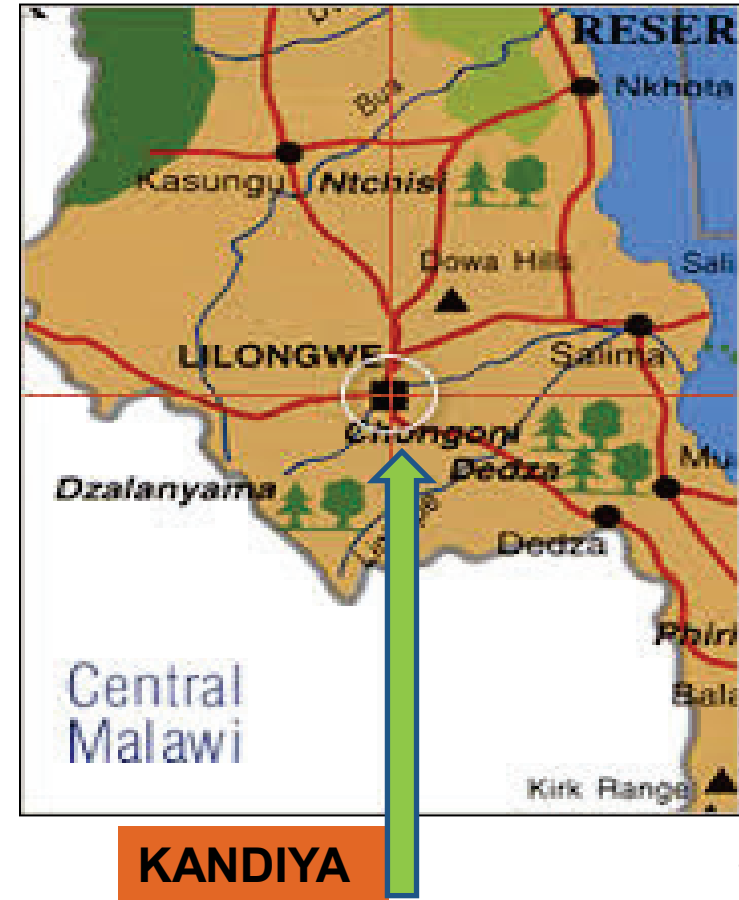
Objectives

- Evaluate the effect of **scout-based** application as an effective substitute to routine applications for control of various insect pests on tobacco
- Establish the effectiveness of **integrating root knot resistant tobacco cultivars** and nematicides as a sustainable way for root knot nematode management



Materials & Methods

- **SITE:** Trials were conducted from 2013-2015 at the Agricultural Research and Extension Trust (ARET) farm at Kandiya in Lilongwe district (Central Malawi)
- 3 burley tobacco cultivars - ABH 31, (**MR to root knot**) and resistant to Fusarium wilt, Mkanachikhosi (OPV with resistance to Fusarium wilt) and KBM 33 (OPV susceptible to root knot and Fusarium wilt)

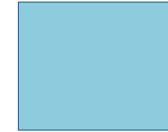


- Tested 3 application rates of **Vydate 100 GR** (Oxymyl) of **0**, **0.625** (half-rate) and **1.25g/plant** (full-recommended rate) at transplanting.
- 4 insecticide application practices: **Routine**, **Scout-based**, **Confidor 70 WG** (Imidacloprid) at planting, and **No chemical**
- 3 x 3 x 4 factorial arrangement in RCBD with two replicates



Pest Assessment

- Assessment started 2 WAP and thereafter progressed on a weekly basis up to eight weeks
- The following thresholds were used to determine whether an insecticide spray was required or not (Scout-based)
- Budworms: 10% of plants/ plot have 1 or more budworms
- Aphids: 10% of plants per plot have 50 or more aphids on at least one leaf – *never achieved during first 7 wks*



Data Capturing

- Weekly budworm count, budworm damage severity rating using a rating scale of **0 to 5** (0 = no damage and 5 = severe damage)
- Aphid count on one upper leaf by visual assessment of each individual plant
- # of insecticide applications
- Root knot scores at 9 and 12 WAP using a scale of 0 - 10 where 0 = no galling and 10 = severe root galling



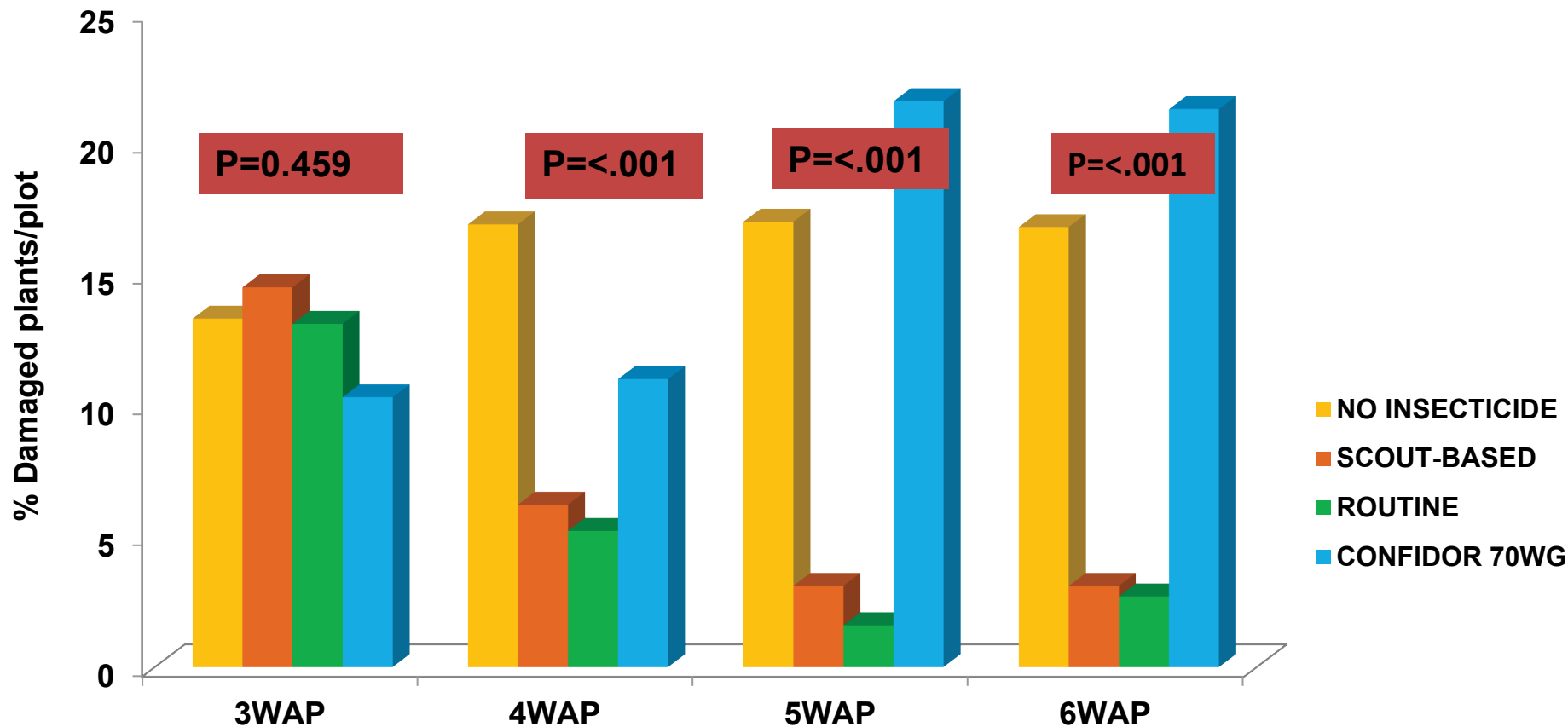
Data analysis:

- Data from tobacco budworm, tobacco aphid assessments and root knot scores were subjected to analysis of variance and treatment means were separated using least significance difference at 5% level of significance

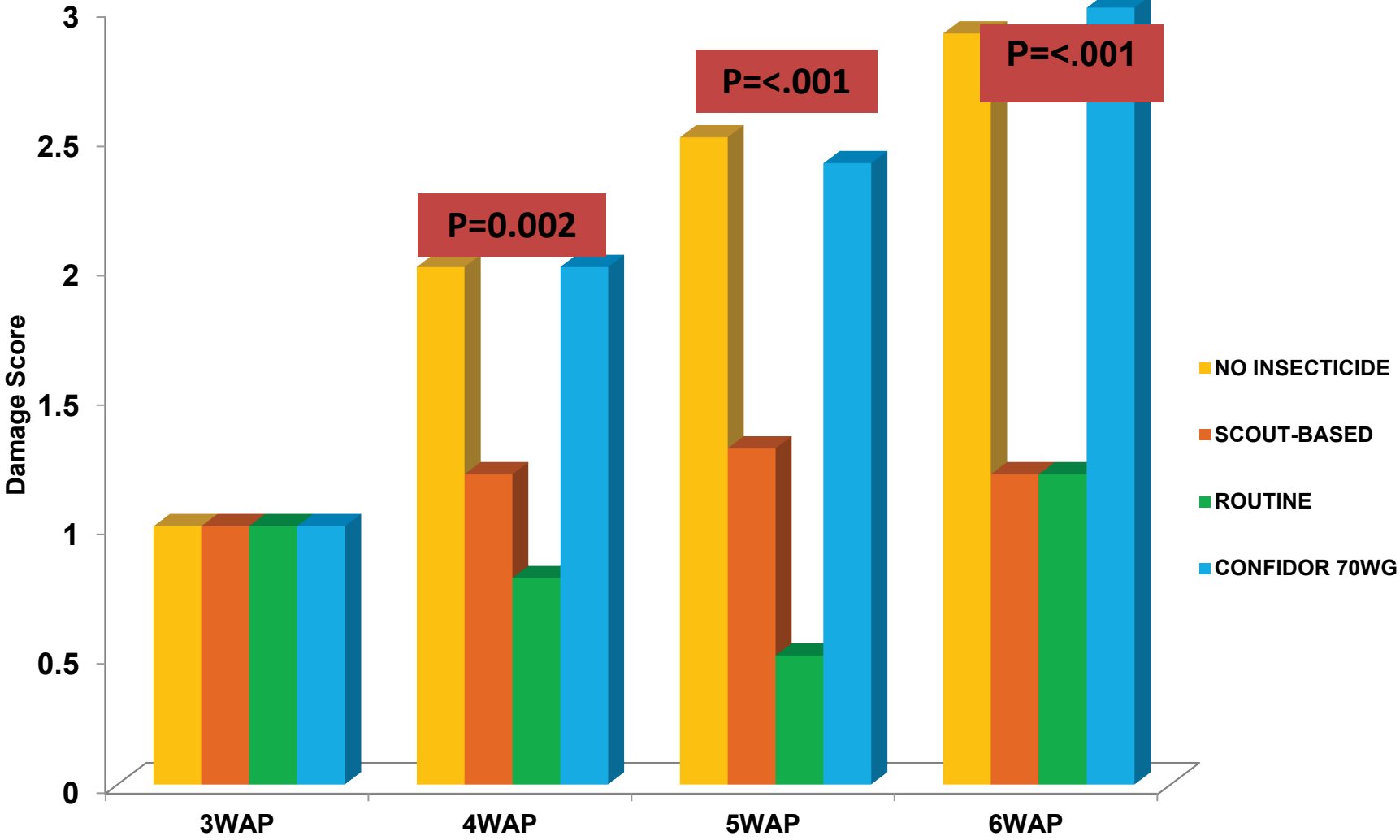


Results and Discussion

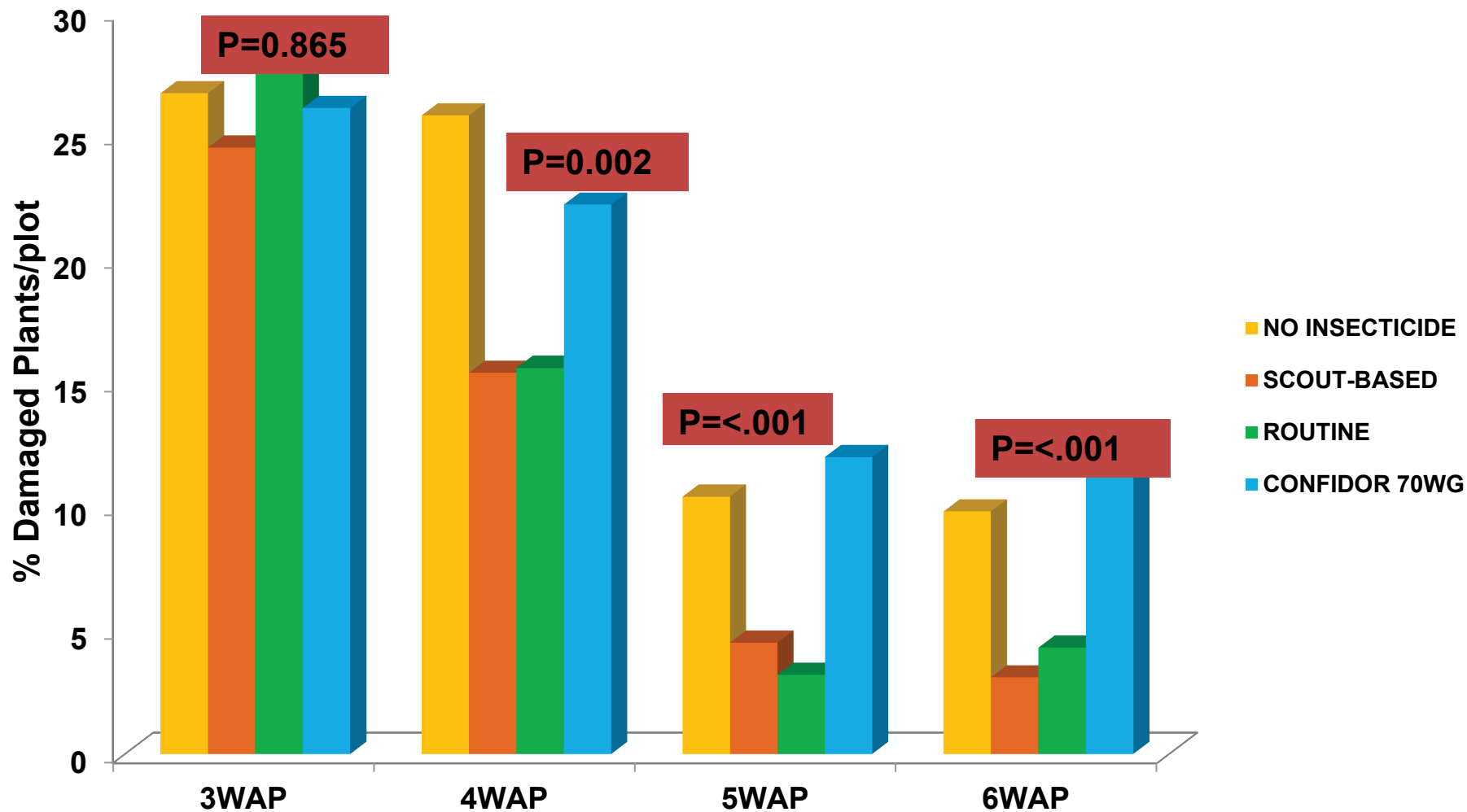
Tobacco budworm infestation in the 2013/14 season (% damaged plants)



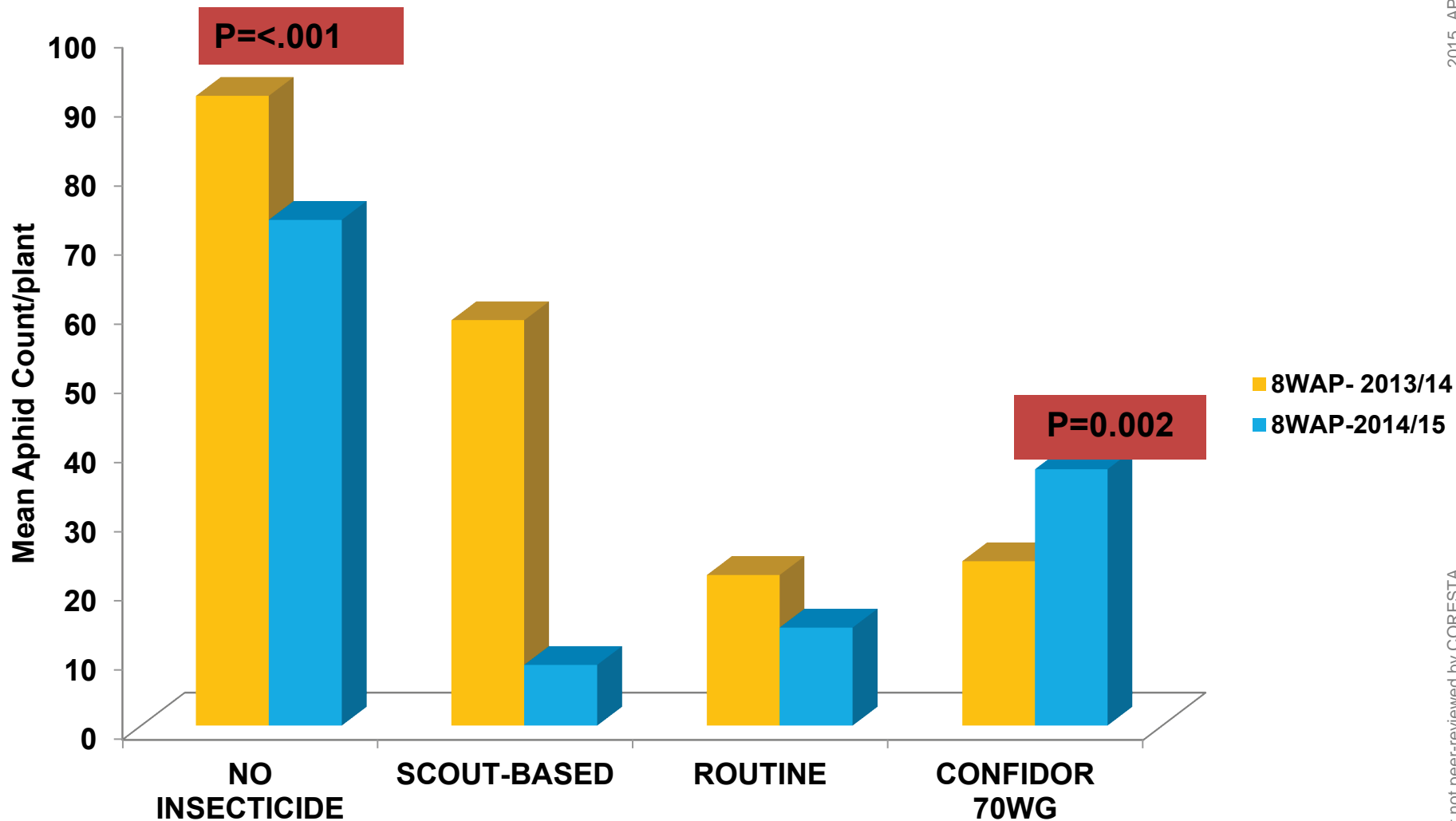
Tobacco budworm infestation in the 2013/14 season - damage score (0-5)



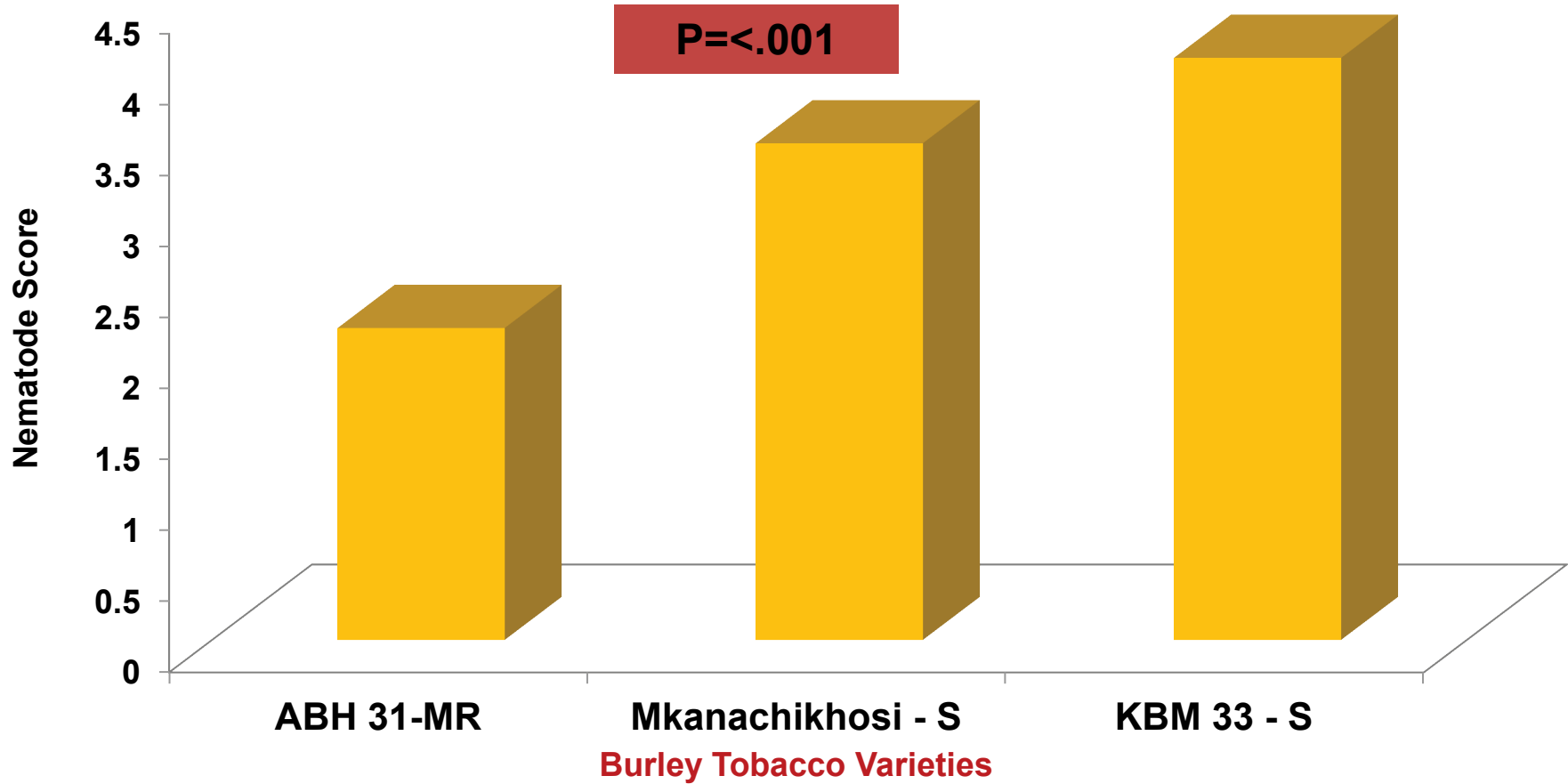
Tobacco budworm infestation in the 2014/15 season (% damaged plants)



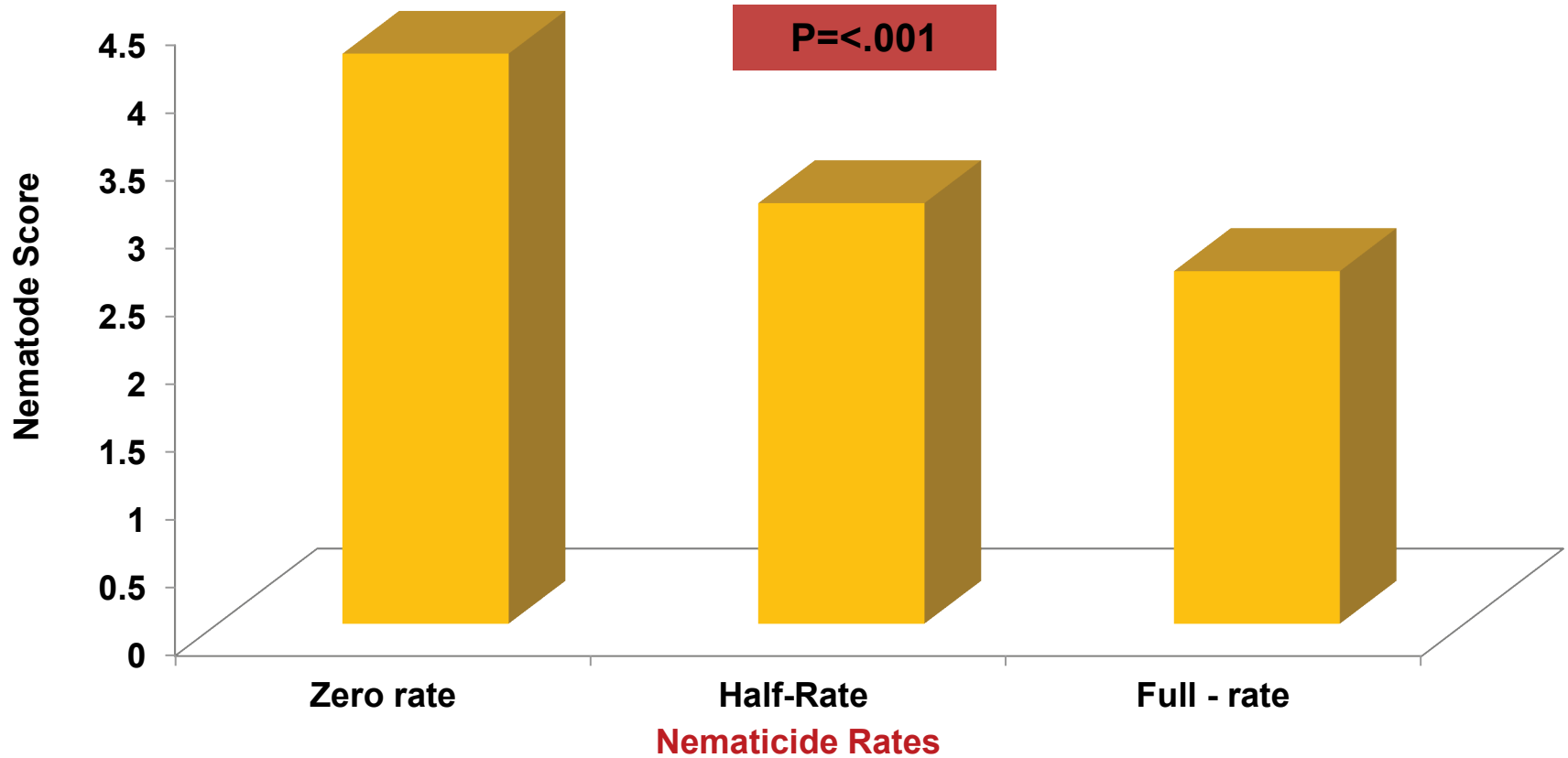
Mean aphid counts at 8 weeks after transplanting across insecticide application practices



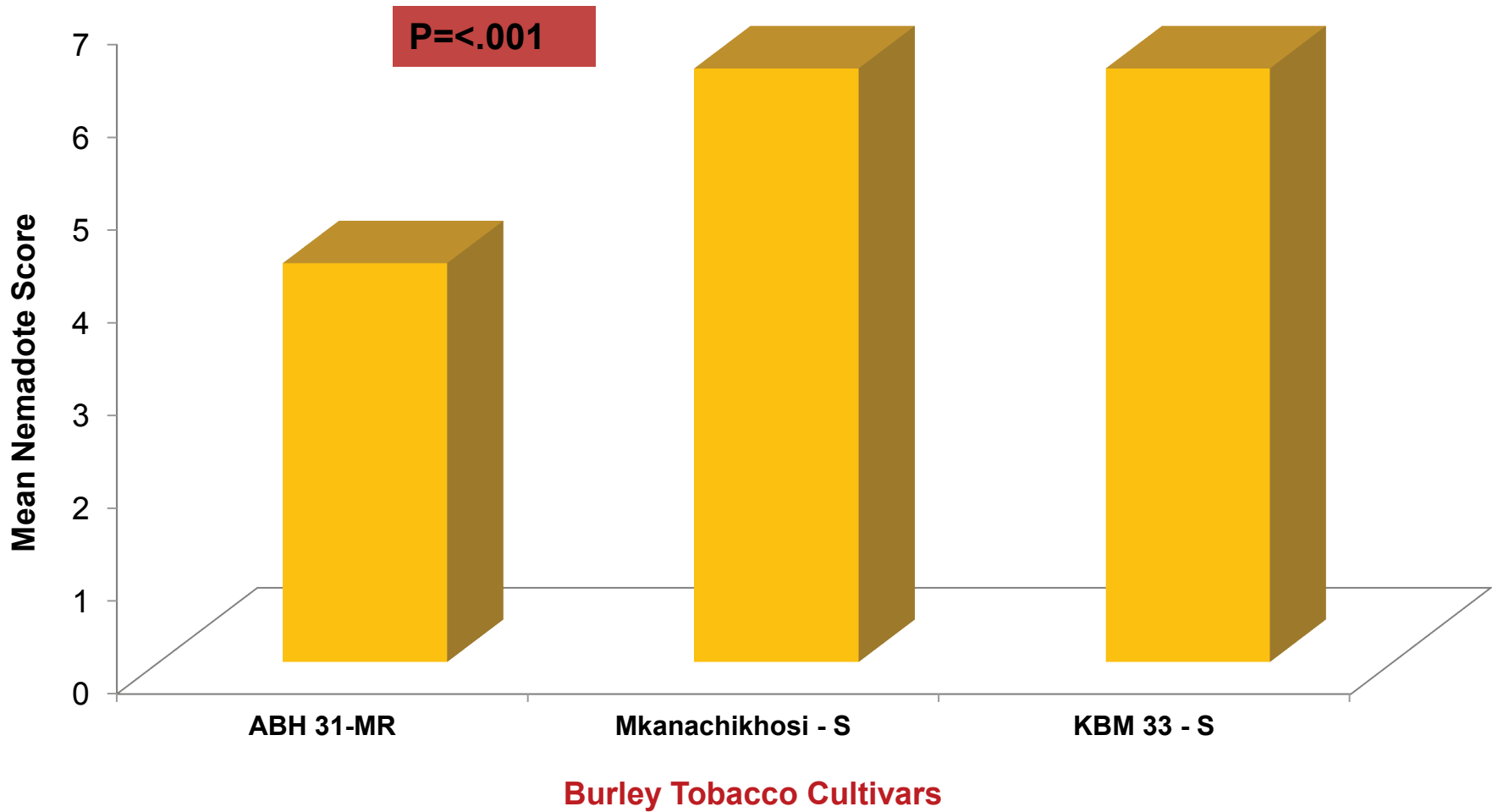
Root knot nematode infection in the 2013/14 season across cultivars at 12 wks (Scale: 0-10)



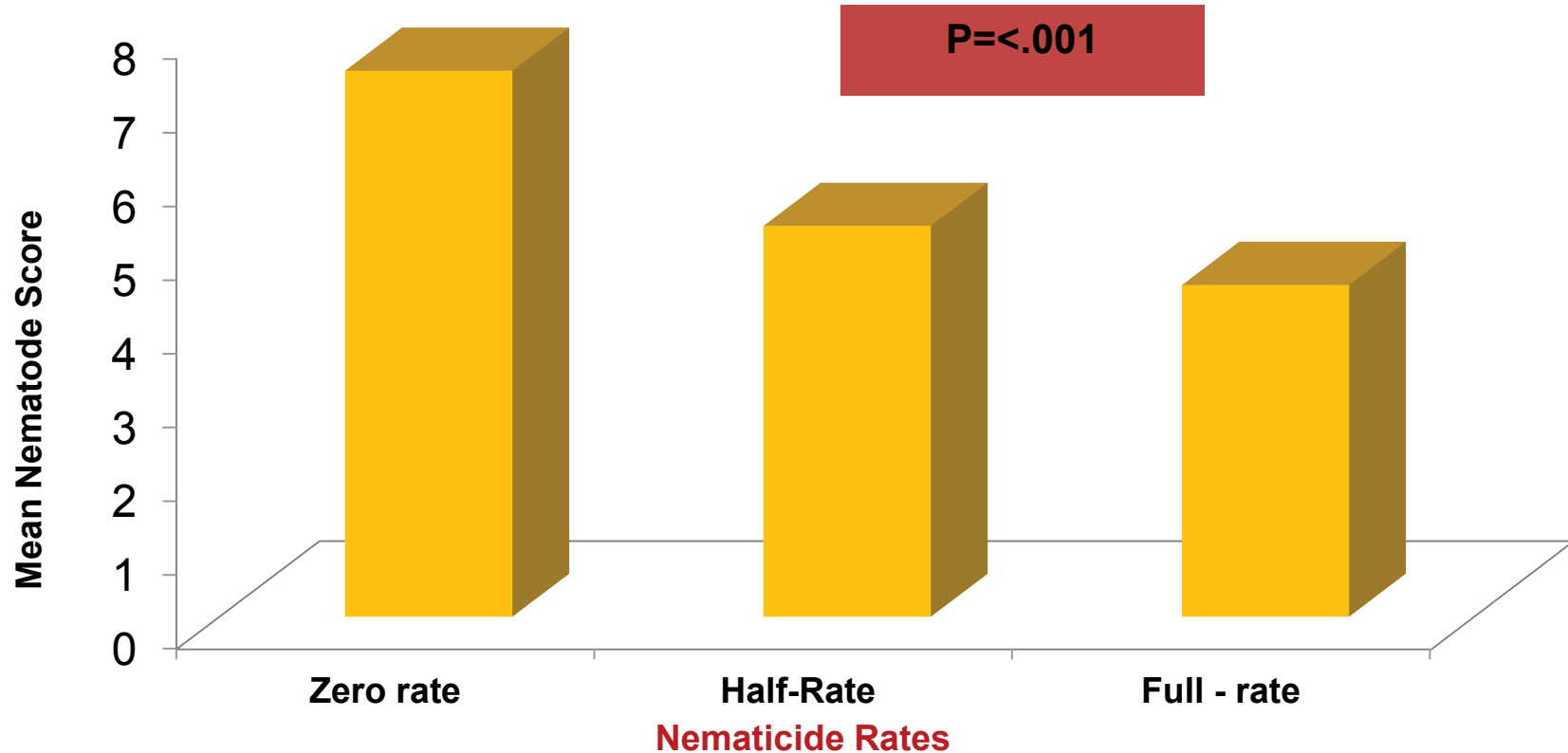
Root knot nematode infection in the 2013/14 season across nematicide rates at 12 wks (Scale: 0-10)



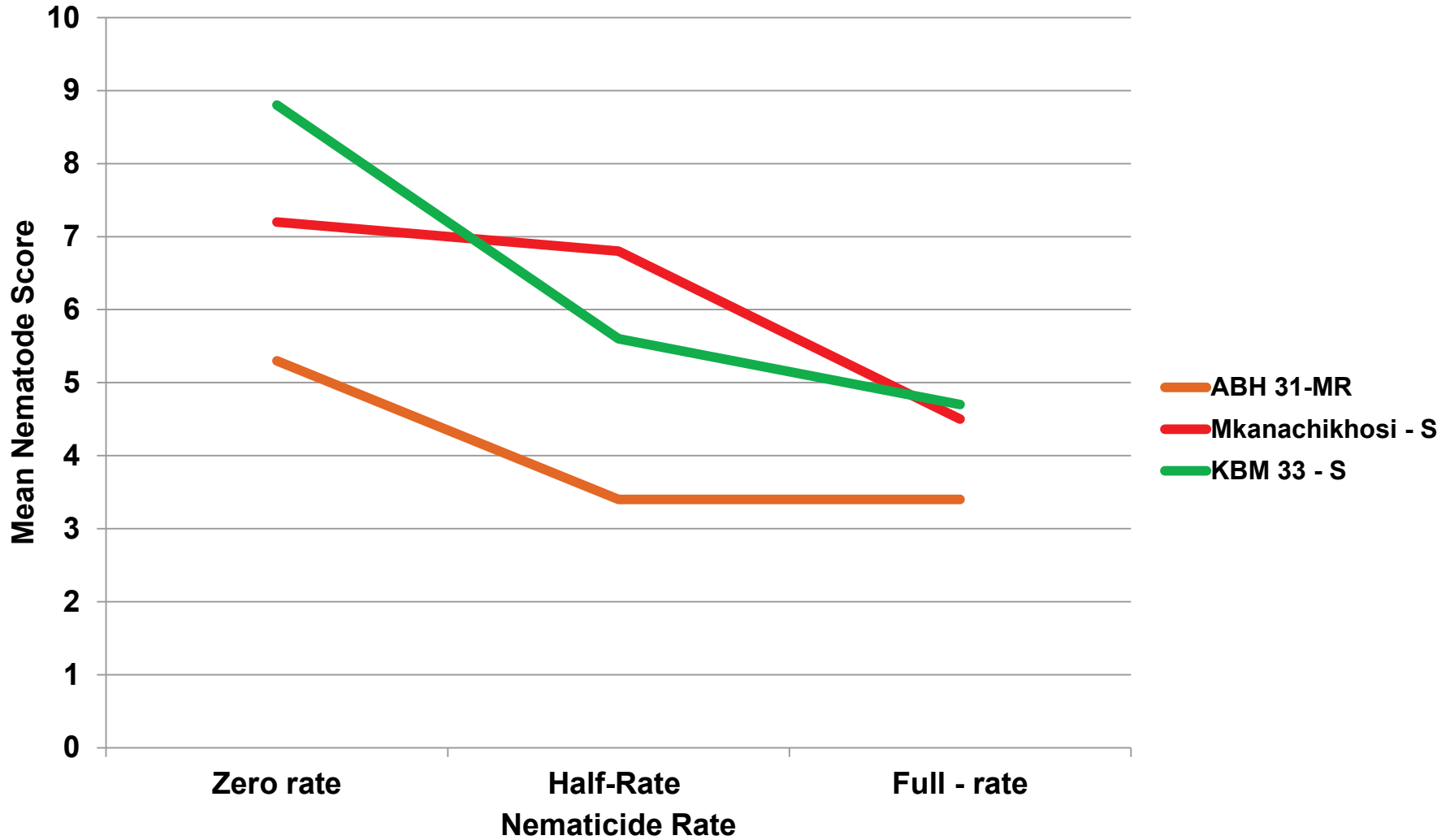
Root knot nematode infection in the 2014/15 season across tobacco cultivars (Scale: 0-10)



Root knot nematode infection in the 2014/15 season at 9 wks across nematicide rates (Scale: 0-10)

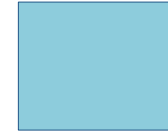


Mean nematode scores at 9 WAP : Tobacco Variety by Nematode rate interaction, 2014/15 season



Conclusion

- This study aimed at establishing the effect of scout-based application as an effective substitute to routine sprays and integration of resistance as a sustainable approach for control of pests on tobacco
- Targeted insecticide application achieved similar level of control as would routine sprays and reduced # of sprays by 2/3
- Integration of nematode resistance with nematicides controlled nematodes much better



Acknowledgement

- Co-authors for helping shape this paper

- Technicians for helping out with data collection



THANK YOU

