

Determination of Microwave Energy on Maize Kernel Quality

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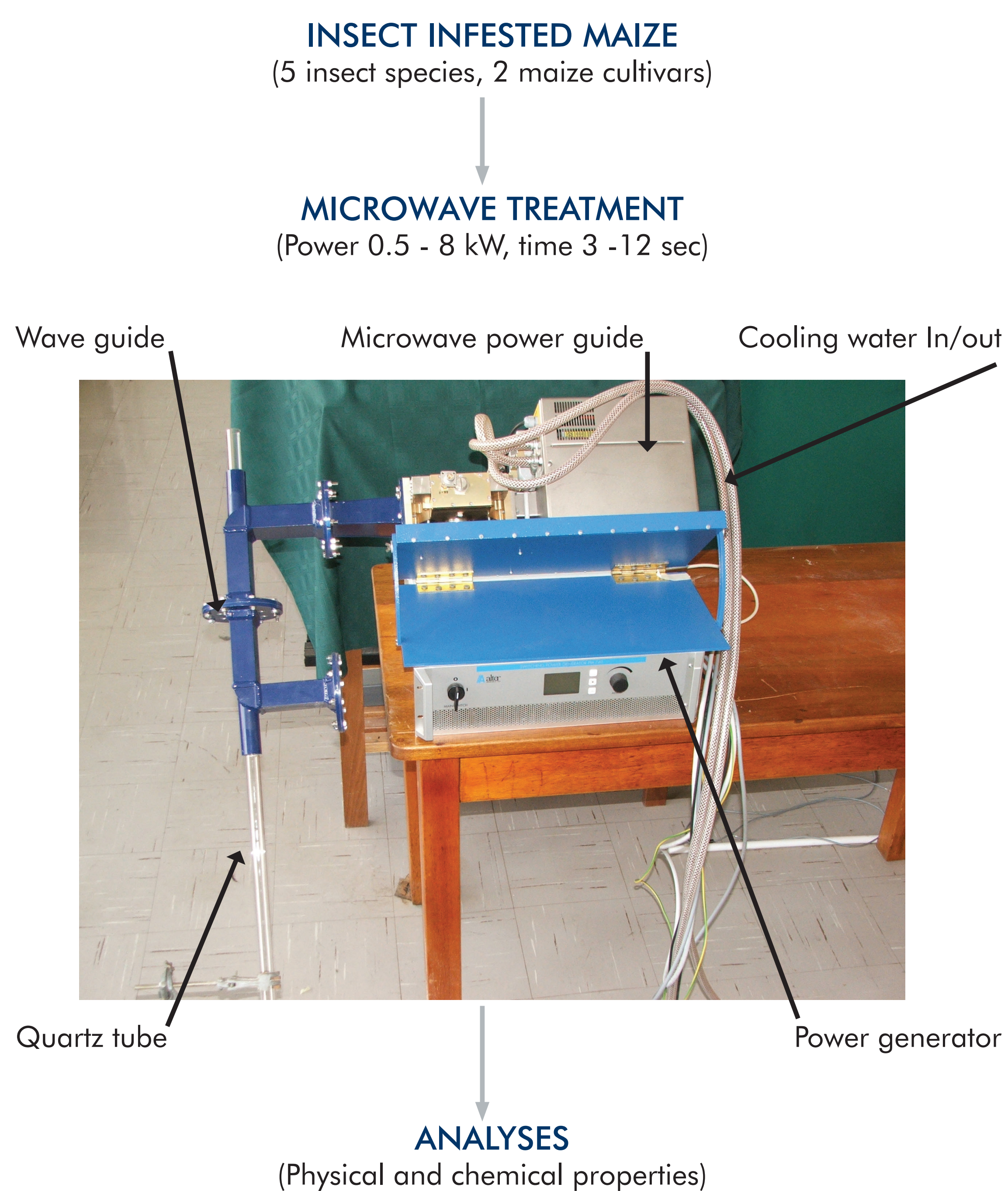
INTRODUCTION

One of the major problems that affects maize quality is insect infestation of the stored products. Methyl bromide, a chemical pesticide, is perceived as being ozone depleting (Bell, 2000). Environmental and health hazards associated with chemical pesticides have led to an interest in the possible use of microwave energy as a non-chemical insect control measure (Nelson, 1996).

AIM

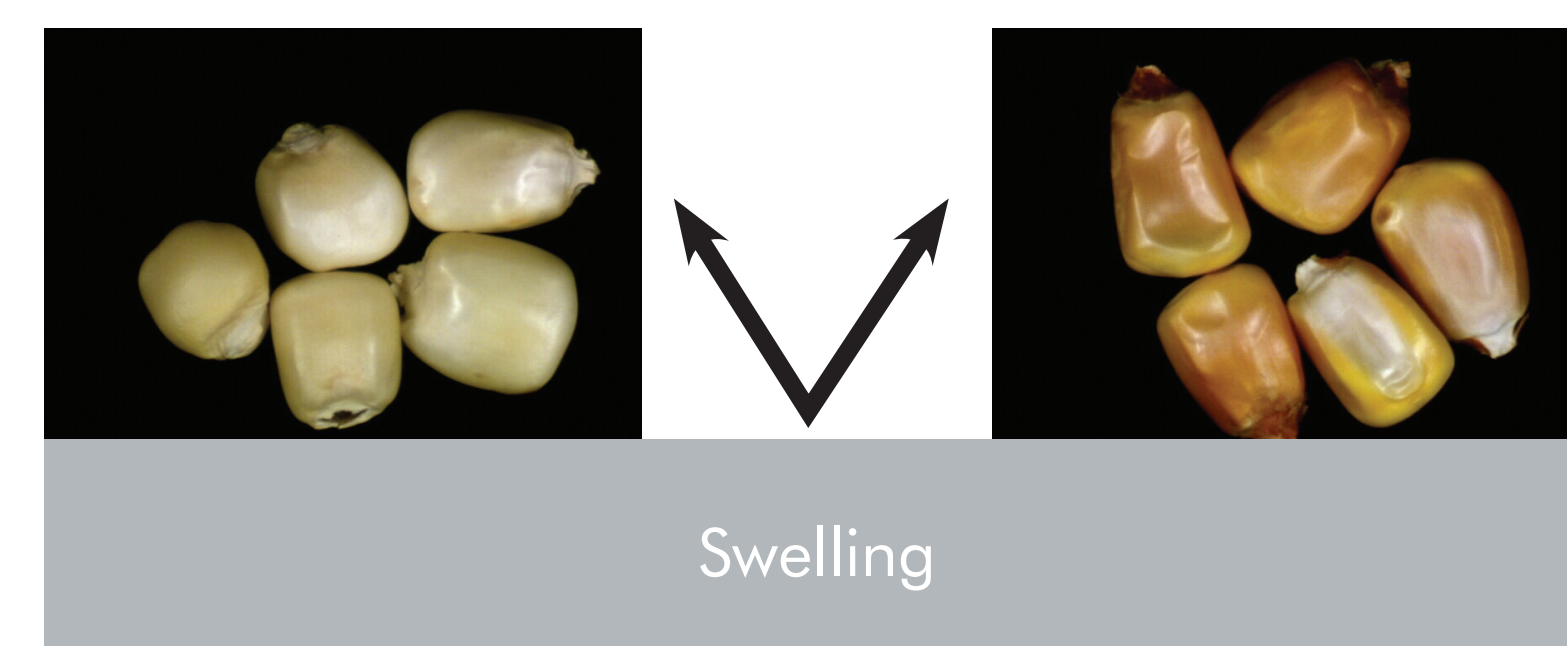
- To determine microwave treatment conditions that can eradicate the most common insect pests in stored-grain products; and
- To determine the effect of microwave energy on maize kernel quality.

EXPERIMENTAL



RESULTS AND DISCUSSION

- 51 microwave treatments investigated;
- Selected treatments effective in eradicating all insect stages without kernel damage; and
- Development of hot spots, swelling and discolouration to kernels observed in other treatments.



Physical/ Chemical property	Treatment	Yellow cultivar	White cultivar	
Moisture content (% wb)	control	14.1	14.3	
	microwaved	12.7	12.2	
100- kernel weight (g)	control	49.4	41.7	
	microwaved	46.7	40.6	
Test weight (kg/hl)	control	77.5	82.9	
	microwaved	77.5	82.0	
Stress cracks* (SCI)	control	32.0	14.8	
	microwaved	27.3	12.8	
Germination (%)	control	95.5	100.0	
	microwaved	97.2	100.0	
Translucency (%)	control	18.7	37.4	
	microwaved	15.1	33.8	
Hardness test	Time (sec)	control	96.3	103.0
		microwaved	108.0	127.0
	C/F ratio #	control	1.8	1.4
		microwaved	1.4	1.3

* Stress cracks index

Coarse to fine particle ratio

CONCLUSION

Microwave technology has the potential to be applied as a grain insect infestation control measure.

REFERENCES

- Bell, CH., 2000. Fumigation in the 21st century. *Crop Protection* **19**, 563-36
- Nelson, SO., 1996. Review and assessment of radio- frequency and microwave energy for stored-grain insect control. *Transactions of the American Society of Agricultural Engineers* **39**, 1475-1484