

Success with a mycoinsecticide formulation for grain storage treatment

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Opportunity in grain storage



- Beetles, moths, mites and psocids
- Yield loss and rejection of treated grain
- Insecticide resistance
- Removal of available products
- UK Cereals Authority challenged to find “green” solution
- UK grant aided consortium from science and industry to develop a mycopesticide



IMI389521: A new *Beauveria* isolate for grain pests



- Isolated from pests in UK grain stores
- Adapted to cool, dry conditions
- Maintains viability and efficacy on target species
- Product development initiated 2005



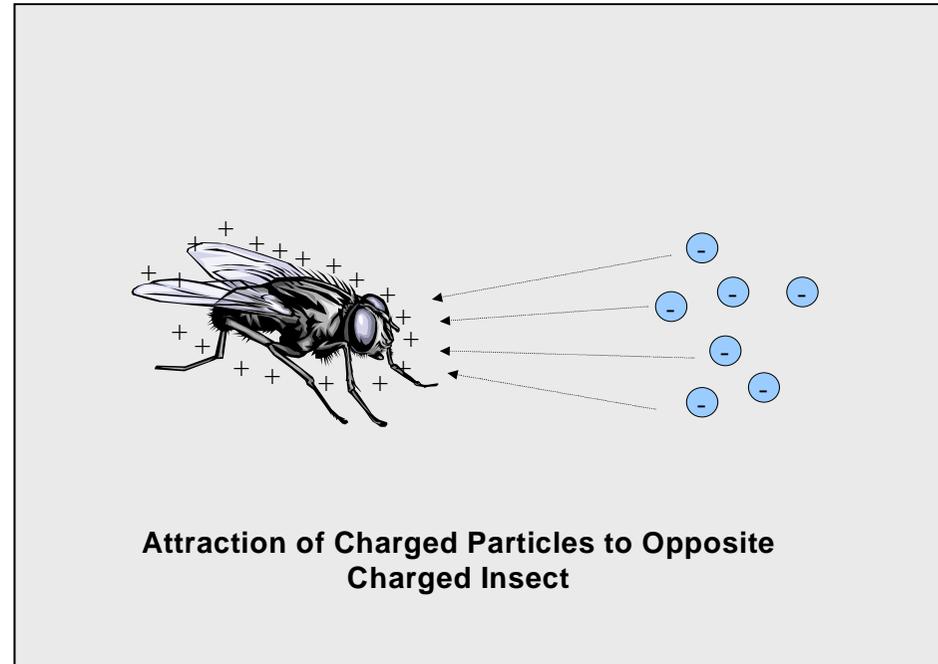
Entostat[®] powder as a delivery system



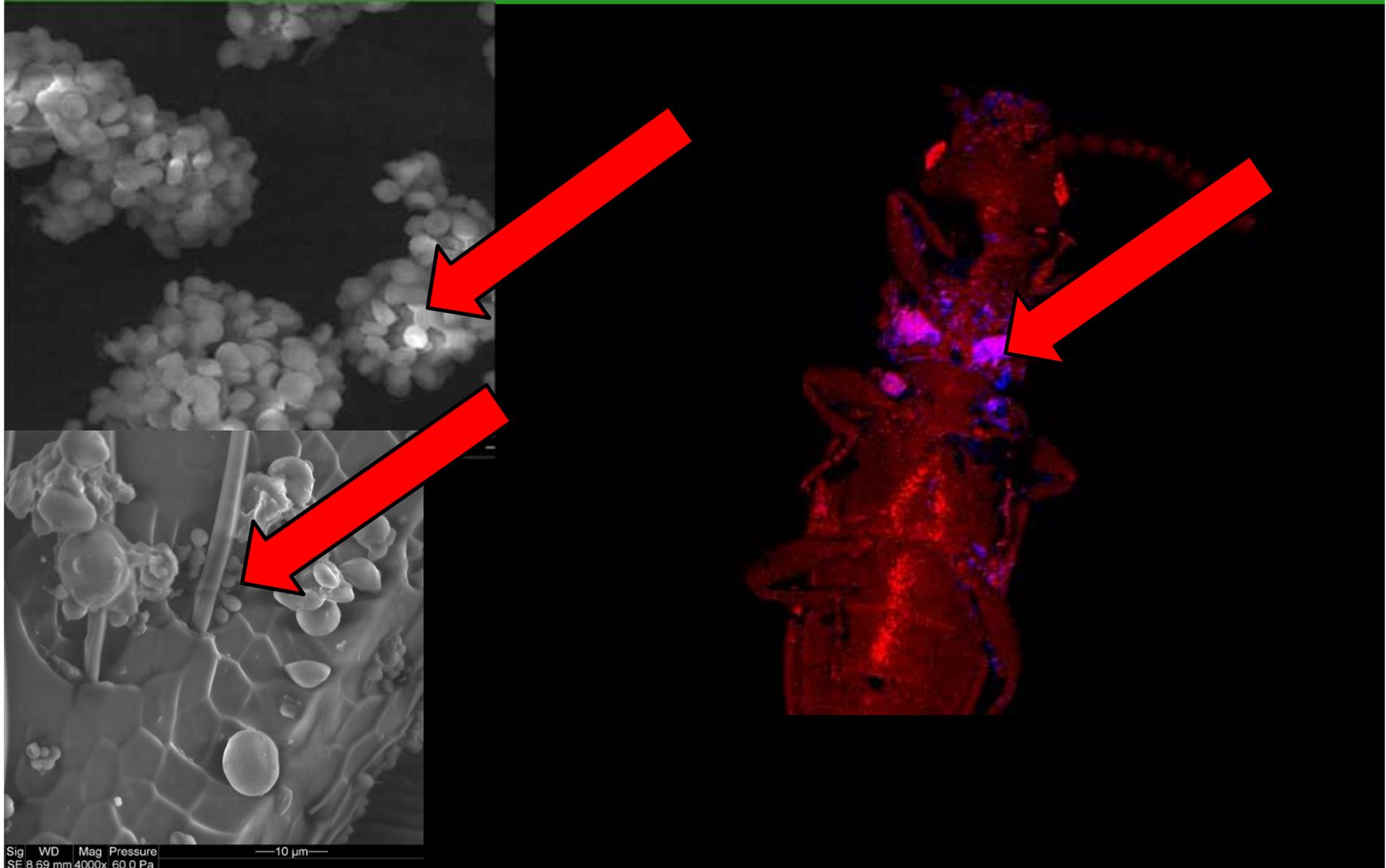
A bipolar electret, tribo-charging 80% to the negative.

Holds a charge for extended periods

Insects charge positively through movements



Co-location of particles and adhesion to grain beetles



Sig SE 8.69 mm WD 4000x Mag 60.0 Pa Pressure

—10 μm—

Production at SylvanBio



Mass production methods using rice were developed by SylvanBio



High yields (1×10^{11} conidia per gram)

High germination rates (>80%)

No contaminants present



Current development project

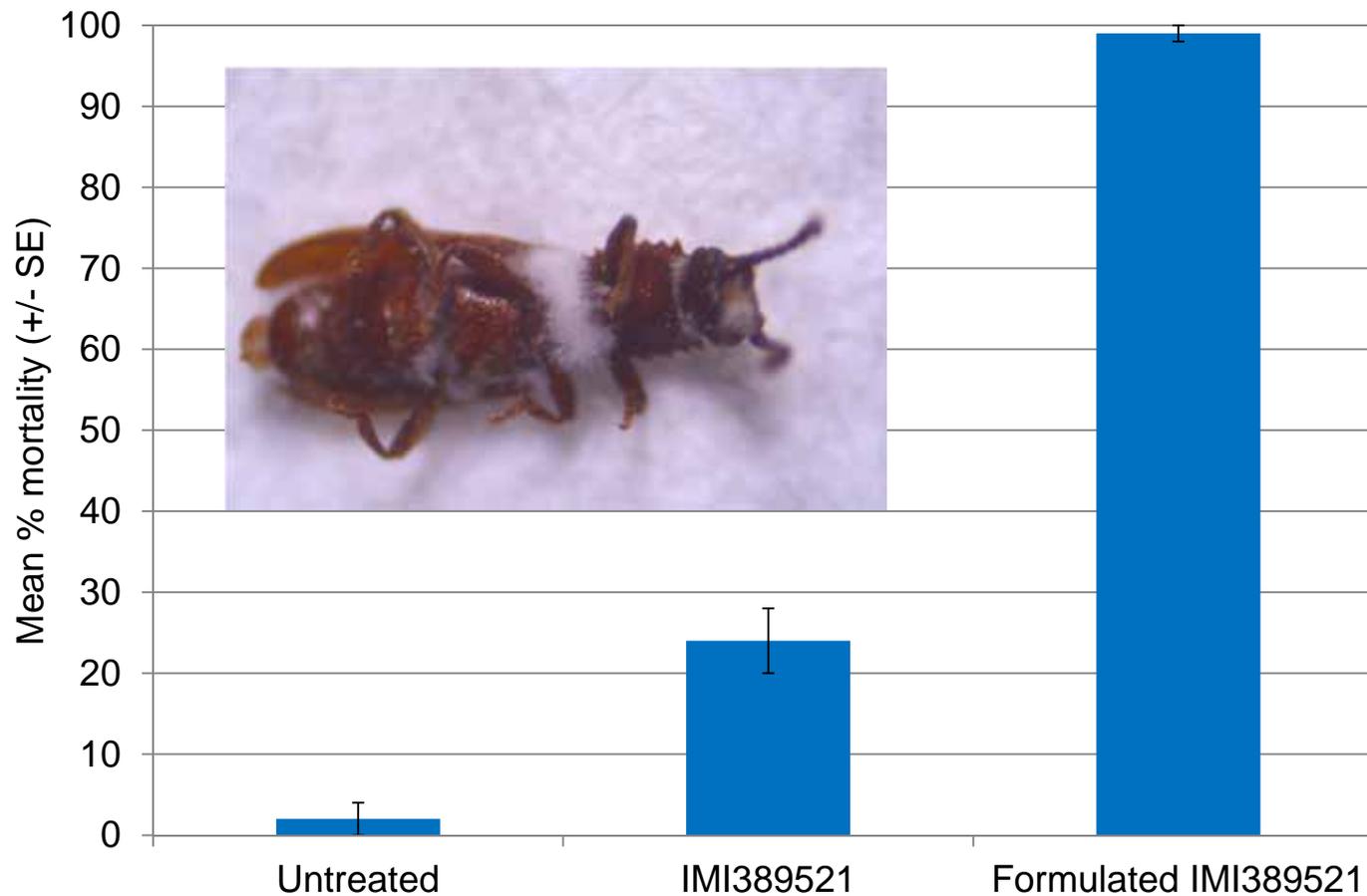


- TSB grant funds development from 2010 to 2013
- Generate all data for EU registration dossier
- Exosect leads consortium including SylvanBio, FERA, CABI, Check Services
- Product designed to treat building fabric
- Finalise production methods
- Develop a sprayable formulation

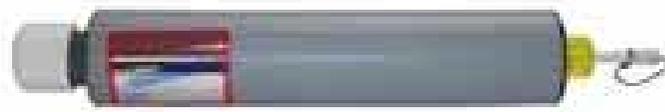
Potential of fungal performance in formulation



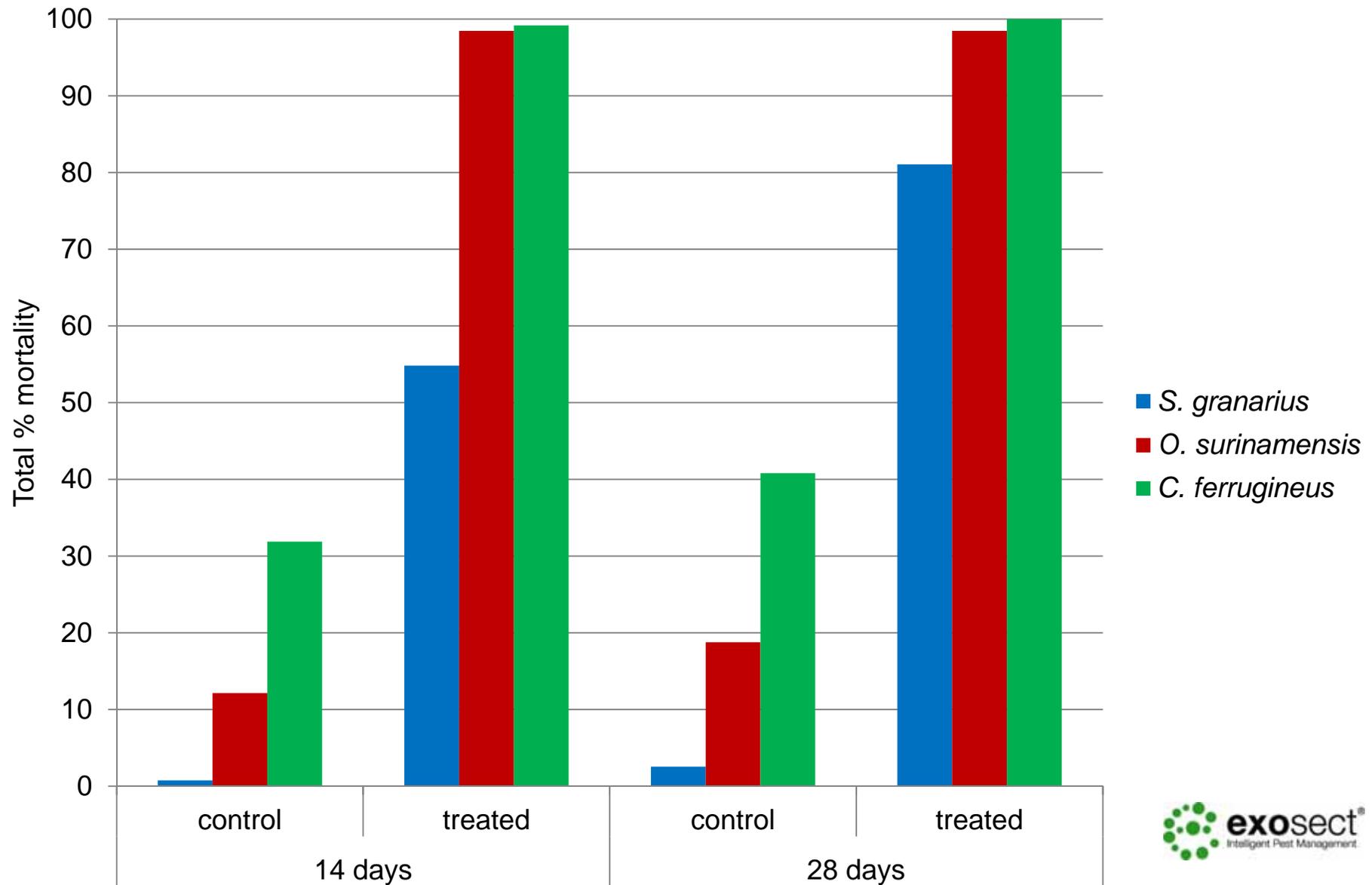
Mortality of *Oryzaephilus surinamensis* at 7 days



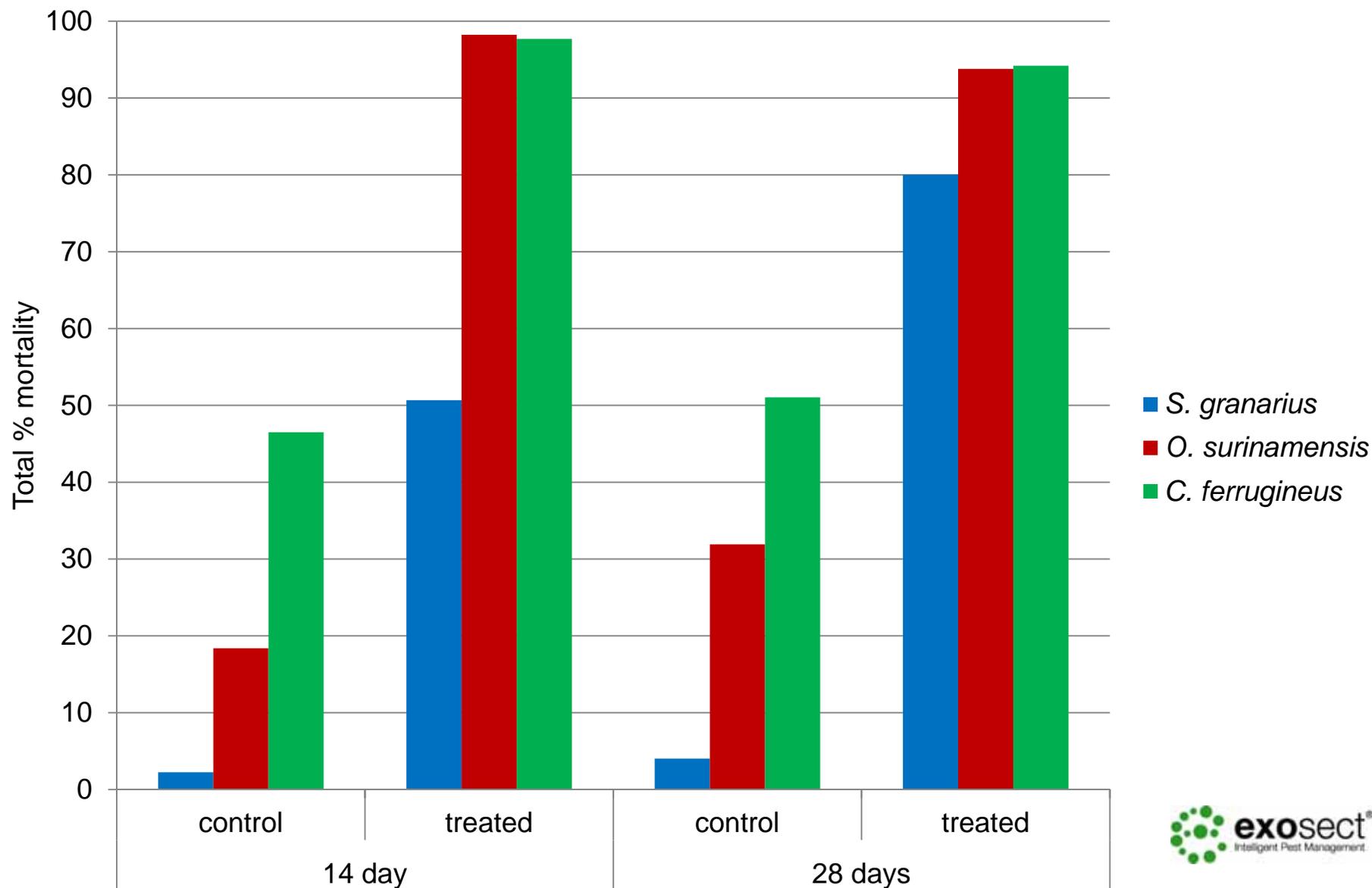
Field trial at commercial site with formulated product



Mortality of beetles at 14 and 28 days



Mortality in second insect introduction (one month after treatment applied)



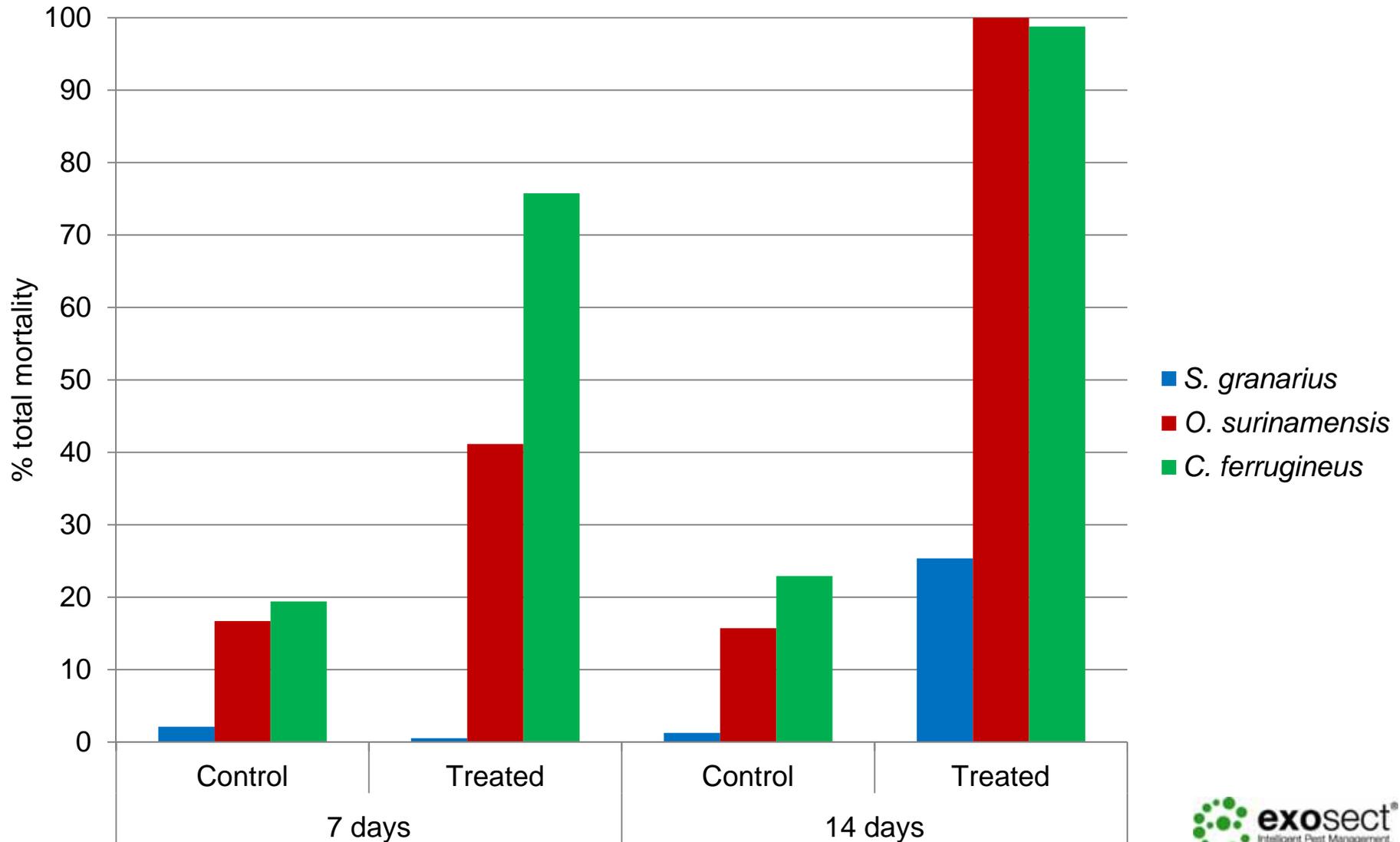
Conclusions from first full scale trial



- High levels of control for biological (>90% mortality)
- Fungal viability maintained over at least 8 weeks
- Application was simple
- Treatment clean up with industrial vacuum
- Check mortality < 14 days
- Reduce application rate

Hot off the press!

Half rate, 2 week trial, cooler conditions



Next steps



- More trials at reduced application rate
- Test wettable formulation
- Complete other studies required for reg dossier
- Target dossier submission 2014
- Global licensing opportunity
- Develop formulation for admixture

