Bulletin of Entomological Research (2015) **105**, 259–260
doi:10.1017/S0007485314000881

CORRIGENDUM

Development and reproduction of *Spodoptera eridania* (Lepidoptera: Noctuidae) and its egg parasitoid *Telenomus remus* (Hymenoptera: Platygastridae) on the genetically modified soybean (*Bt*) MON 87701 × MON 89788 – Corrigendum

O.C. Bortolotto, G.V. Silva, A. de Freitas Bueno, A.F. Pomaria, S. Martinelli, G. P. Head, R. A. Carvalho and G.C. Barbosa

doi: 10.1017/S0007485314000546. Published by Cambridge University Press, 24 September 2014.

The original version of this paper contained inaccurate statements regarding the composition and potential environmental impacts of MON 87701 × MON 89788 soybean. Comprehensive studies by Berman *et al.* (2010, 2011) in the United States, Brazil and Argentina have demonstrated the compositional equivalence of MON 87701 × MON 89788 to conventional soybean across all of these regions and growing seasons. Any statistical differences between the test material and its corresponding soybean control were generally small in magnitude, and all test mean values for these components were within the 99% tolerance interval determined from commercial soybean varieties. Berman *et al.* (2011) did not find any unexpected effects of transgene insertion on the composition of MON 87701 × MON 89788 soybean. Similarly, hierarchical cluster analysis and principal component analysis of compositional data generated on MON 87701 and MON 89788 soybean seed grown in the northern and southern regions of Brazil during the 2007–2008 season demonstrated that cultivation in different regions contributes more than genetic modification to compositional differences (Harrigan *et al*., 2010). While differences in mean values of test and control fatty acids and isoflavones were either statistically insignificant ($P \geq 0.05$) or of small relative magnitude, there were large differences in the fatty acid and isoflavone profiles of the two region-specific controls.

Therefore the sentences in the original version of the paper that attributed differences in *S. eridania* development to changes in composition of MON 87701 × MON 89788 soybean (second, sixth and seventh paragraphs in the Discussion section, pages 4 and 5) did not reflect the available scientific evidence (Berman *et al*., 2010, 2011; Harrigan *et al*., 2010). The small observed differences in *S. eridania* development are likely due to differences in the genetic background of the soybean materials evaluated.
MON 87701 × MON 89788 soybean expressing Cry1Ac protein has efficacy against the most important soybean lepidopteran pests in Brazil (MacRae *et al*., 2005; Miklos *et al*., 2007; Bernardi *et al*., 2012, 2013). Some secondary insect pests such as *S. eridania* are not controlled by the technology because of low susceptibility to the Cry1Ac protein (Luttrell *et al*., 1999; Sivasupramaniam *et al*., 2008; Bernardi *et al*., 2014). It was partly for this reason that *S. eridania* was used as a model to assess the impact of MON 87701 × MON 89788 soybean on the parasitoid *Telenomus remus*. The current study indicated that MON 87701 × MON 89788 soybean had no adverse tritrophic effects on *T. remus.*

Therefore the Abstract has been amended as follows to reflect the available scientific data:

Genetically modified crops with insect resistance genes from *Bacillus thuringiensis* Berliner (Bt-plants) are increasingly being cultivated worldwide. Therefore, it is critical to improve our knowledge of their direct or indirect impact not only on target pests but also on non-target arthropods. Hence, this study evaluates comparative leaf consumption and performance of *Spodoptera eridania* (Cramer), a species that is tolerant of the Cry1Ac protein, fed with Bt soybean, MON 87701 × MON 89788 or its near non-Bt isoline. Using this species as a model, we assessed the comparative performance of the egg parasitoid *Telenomus remus* Nixon on eggs of

S. eridania produced from individuals that fed on these two soybean genotypes as larvae. Results showed that *Bt* soybean did not affect pest foliage consumption, but did reduce larval duration by two days despite larvae in both treatments having six instars. Nevertheless, survival of *S. eridania* larvae, pupal weight, sex ratio, fecundity and longevity of female moths, and egg viability did not differ between *Bt* and non-*Bt* soybeans. Adult longevity of *S. eridania* males was increased when caterpillars were fed with *Bt* soybean versus the near isoline. No adverse effects of this technology were observed for the egg parasitoid *T. remus*.
This Corrigendum has been approved for publication by all authors of the original paper.

References

Bortolotto, O. C., Silva, G. V., de Freitas Bueno, A., Pomaria, A. F., Martinelli, S., Head, G. P., Carvalho, R. A. & Barbosa, G. C. *Bulletin of Entomological Research* **104**, 724–730.

Berman, K.H., Harrigan, G.G., Riordan, S.G., Nemeth, M., Hanson, C., Smith, M., Sorbet, R., Zhu, E. & Ridley, W.P. (2010) Compositions of forage and seed from second-generation glyphosate-tolerant soybean MON 89788 and insect-protected soybean MON 87701 from Brazil are equivalent to those of conventional soybean (*Glycine max*). *Journal of Agricultural and Food Chemistry* **58**, 6270–6276.

Berman, K.H., Harrigan, G.G., Nemeth, M.A., Oliveira, W.O., Berger, G.U. & Tagliaferro, F.S. (2011) Compositional Equivalence of Insect-Protected Glyphosate-Tolerant Soybean MON 87701 × MON 89788 to Conventional Soybean Extends across Different World Regions and Multiple Growing Seasons. *Journal of Agricultural and Food Chemistry* **59**(21), 11643–5.

Bernardi, O., Malvestiti, G.S., Dourado, P.M., Oliveira, W.S., Martinelli, S., Berger, G.U., Head, G.P. & Omoto, C. (2012) Assessment of the high-dose concept and level of control provided by MON 87701 × MON 89788 soybean against *Anticarsia gemmatalis* and *Pseudoplusia includens* (Lepidoptera: Noctuidae) in Brazil. *Pest Management Science* **68**, 1083–1091.

Bernardi, O., Dourado, P.M., Carvalho, R.A., Martinelli, S., Berger, G.U., Head, G.P. & Omoto, C. (2013) High levels of biological activity of Cry1Ac protein expressed on MON 87701 × MON 89788 soybean against *Heliothis virescens* (Lepidoptera:Noctuidae). *Pest Management Science* **70**, 588–94.

Bernardi, O., Sorgatto, R.J., Barbosa, A.D., Domingues, F.A., Dourado, P.M., Carvalho, R.A., Martinelli, S., Head, G.P. & Omoto, C. (2014) Low susceptibility of *Spodoptera cosmioides, Spodoptera eridania* and *Spodoptera frugiperda* (Lepidoptera: Noctuidae) to genetically-modified soybean expressing Cry1Ac protein. *Crop Protection* **58**, 33–40.

Harrigan, G. G., Lundry, D., Drury, S., Berman, K.H, Riordan, S. G., Nemeth, M. A, Ridley, W. P. & Glenn, K. C. (2010) Natural variation in crop composition and the impact of transgenesis. *Nature Biotechnology* **28**(5), 402–404.

Luttrell, R.G., Wan, L. & Knighten, K. (1999) Variation in susceptibility of Noctuid (Lepidoptera) larvae attacking cotton and soybean to purified endotoxin proteins and commercial formulations of *Bacillus thuringiensis*. *Journal of Economic Entomology* **92**, 21–32.

MacRae, T.C., Baur, M.E., Boethel, D.J., Fitzpatrick, B.J., Gao, A.G., Gamundi, J.C., Harrison, L.A, Kabuye, V.T., Mcpherson, R.M., Miklos, J.A., Paradise, M.S., Toedebusch, A.S. & Viegas, A. (2005) Laboratory and field valuations of transgenic soybean exhibiting high dose expression of a synthetic *Bacillus thuringiensis Cry1A* gene for control of Lepidoptera. *Journal of Economic Entomology* **98**, 577–587.

Miklos, J.A., Alibhai, M.F., Bledig, S.A., Connor-Ward, D.C., Gao, A., Holmes, B.A., Gao, A.G, Holmes, B.A, Kolacz, K.H, Kabuye, V.T., MacRae, T.C., Paradise, M.S., Toedebusch, A.S. & Harrison, L.A. (2007) Characterization of soybean exhibiting high expression of a synthetic *Bacillus thuringiensis cry1A* transgene that confers a high degree of resistance to lepidopteran pests. *Crop Science* **47**, 148–157.

Sivasupramaniam, S., Moar, W.J., Ruschke, L.G., Osborn, J.A., Jiang, C., Sebaugh, J.L., Brown, G.R., Shappley, Z.W., Oppenhuizen, M. E., Mullins, J.W. & Greenplate, J.T. (2008). Toxicity and characterization of cotton expressing *Bacillus thuringiensis* Cry1Ac and Cry2Ab2 proteins for control of lepidopteran pests. *Journal of Economic Entomology* **101**, 546–554.

https://doi.org/10.1017/S0007485314000881 Published online by Cambridge University Press