



46th APIMONDIA

International Apicultural Congress

MONTRÉAL, 8-12 SEPTEMBER, 2019
QUÉBEC - CANADA

Beekeeping together
within agriculture



Canadian Honey Council



ABSTRACTBOOK

of keeping bees encompasses inter-linked processes. For profitable beekeeping, technology and creativity shall be at the fore, right from honey production, processing, value addition and marketing, with employment prospects. It had been observed that stingless bees (Jaycox, 1979; Sellers, 2007), alongside honeybees (Connor, 1970; Crane, 1985; Bradbear, 2009) play a critical role in pollination to enhance food security. Recent studies in Kenya, Greenhouse and open field experiments, involving a variety of fruits and vegetables: Strawberry, Tomato, Bean, Sunflower, Cucumber, Sweet pepper and other quick flowering plants, which are bee-pollinated, showed significant positive increases in fruit and produce, as a result of pollination, hence supporting the Greenhouse technology and pollination intervention, for sustainable production. It was recommended that stingless and solitary bees be integrated in farming systems, complemented by honeybees, for pollination of strawberries, tomato, beans and other fruits and vegetables, to boost food and nutrition security, for improved incomes to enhance rural livelihoods, hence quick economic growth to a middle income economy, as stipulated in: Livestock and Beekeeping Policies (2010), Agriculture and Apiculture Strategic Plans (2012-2017; 2017-2022), Agricultural Sector Development Strategy (ASDS, 2009-2020), Kenya Climate Smart Agriculture Strategy (2017-2026), Kenya's Vision 2030, Kenyan Government's Big 4 agenda (2018) and specific Sustainable Development Goals of the United Nations (2017).

[P.10.213] Characteristics of the tomato fruit (*Lycopersicon esculentum* Miller) using native Bumblebees as pollinators in greenhouse

S. Salvarrey¹, E. Santos¹, N. Arbulo², G. Giménez³, C. Invernizzi¹

¹ Facultad de Ciencias, Montevideo, URUGUAY, ² Centro Regional Este, Rocha, URUGUAY, ³ Instituto de investigación Agropecuaria, Canelones, URUGUAY

In Uruguay the production of tomato (*Lycopersicon esculentum* Miller) in greenhouse conditions presents pollination issues that limit its yield. The use of *Bumblebees* (*Bombus* spp.) as pollinators can help overcome this problem as they perform, buzzing pollination, a behavior that makes them excellent pollinators of Solanaceae and particularly tomato. The aim of this study was to evaluate the effect of the native *Bumblebees* *Bombus atratus* on the characteristics of the American tomato (ELPIDA variety). An experience was made in Canelones department where the fruits from flowers pollinated by *Bumblebees* and flowers not visited by insects were compared and two experiences in Salto similar to that of Canelones but including flowers treated with hormones. In the three greenhouses analyzed the visit of the *Bumblebees* to the flowers increased the proportion of fruit set in 13 – 47 % in relation to the result obtained in flowers not visited by the insects. Also, the pollinator action of *Bumblebees* significantly improved the weight, size and number of seeds compared to fruits obtained from flowers without access to pollinators, although this improvement was only recorded in the experience in Canelones and in one of three greenhouses from Salto. In one of the experiences of Salto, flowers pollinated by *Bumblebees* gave rise to tomatoes of greater weight, size and number of seeds than those from plants treated with hormones. This study is the first in Uruguay to show the benefits of using native *Bumblebees* to improve tomato production in greenhouses.

[P.10.214] Botanical species visited by Bumblebees *Bombus atratus* used for the pollination of red clover (*Trifolium pratense*)

S. Salvarrey¹, E. Santos¹, C. Rossi², C. Silvestre³, C. Invernizzi¹

¹ Facultad De Ciencias, Montevideo, URUGUAY, ² Instituto De Investigacion, Colonia, URUGUAY, ³ Brometan, Buenos Aires, ARGENTINA

Red clover (*Trifolium pratense*) is the most common forage legume in Uruguay. However, the country's demand does not have to be met. Among the main causes that impede improving yields is the deficit pollination. Previous studies showing the use of native *Bumblebees* *Bombus atratus* as a pollinator can yield very good seed yields. The recent availability of colonies of *B. atratus* through artificial breeding translates throughout the year allows the use of this pollinator at the optimum time of cultivation (December-January), two months before the natural colonies, reach the peak of population (March). To determine the production of red clover seeds using colonies of *B. atratus* in December 2019, they installed 16 colonies of *B. atratus* (Brometan, Argentina) in a 6 ha nursery of red clover (variety La Estanzuela 116). During the period of flowering of the red clover 7 samples were taken from the contents in the pots of the nests and then their botanical origin was analyzed by palynological techniques. The presence of red clover pollen varied between 19.3% and 52.1%, coinciding with the maximum income with the peak of flowering of the crop. The most competitive plant species were: Eucalyptus spp. (6.2-47.2%), white clover (*Trifolium repens*) (2.9 to 19%), palm trees (*Arecaceae* spp.) (18.5-41.2%), lotus (*Lotus corniculatus*) (0.8-11.1%) and a native myrtaceae (2.2 -17.0%). The first two resources are present in the last three registers. Four colonies that did not have access to sugar syrup available in an internal dispenser collected more nectar from red clover ($54 \pm 24\%$) than the remaining 12 colonies that have availability of this food ($27 \pm 23\%$). These results have been predominant in red clover to obtain information (pollinating its flowers), although the competition of other species in the supply of this resource is important.

[P.10.215] The effects of inefficient bee pollination in primary industries can have devastating results on our ability to successfully produce florally-derived food sources - but through natural pheromone usage

A.E. Edge

Melbourne University, Melbourne, AUSTRALIA

The purpose of this product development is to aid in the efficiency and effectiveness of bees to successfully pollinate pre-determined