F BEE MOVEMENT WITH

)enden, United Kingdom

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ır tracking individual flying
ıow been used successfully
, butterflies and moths. It has
) how individuals search for
ploit these resources in a
lar has also enabled us to
navigational abilities of these

cm wavelength, 25 kW peak
g, dual frequency system. A
oximately 10mg and
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ransponder can be detected
)m centred on the radar, in
‹periments in a flight room
: unduly hindered by the
ər, and continue to fly and
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ıis technique, examples will
s and bumblebees explore the
flights, and how these flights
)rager flights. Radar tracking
xamine bees' searching
ıen naïve bees are looking for
re displaced into unfamiliar
ıted to find their way home.

AND FOOD PLANTS OF AN AGRICULTURAL

ıinki, Finland

sinki.fi

ıly a few studies dealing with
)ee queens in agricultural
weather conditions and
spring determine the
d therefore the whole
er in the summer.
)llected in spring 2000. The
large patches of farmland.
d using the line-transect
t was of a specific habitat type.
ə habitats (for example ditch
rgin) were also recorded and

Results: 13 bumblebee and cuckoo bumblebee species were recorded in this study. The total of individuals observed was 3,711. At the first and second counts the highest densities of food-collecting queens were in stream sides and at the third and fourth counts on leys. In stream sides the mean area (m2) covered by willows was at its highest and on leys the mean coverage (%) of dandelions was at its highest. Habitats used by different ecological species groups were somewhat different.
Discussion: There are differences in habitat selection by different bumblebee species according to previous studies as well. Habitats used by bumblebees change during the spring as food plants have different flowering periods. Willows are very important at the beginning of the spring and later dandelions become important.

THE RELATIONSHIPS AMONG VARIOUS BEE GENERA (*APIS MELLIFERA* L., *BOMBUS* SPP., *MEGACHILE ROTUNDATA* F. AND *RHOPHITOIDES CANUS* EV.) AS OBSERVED ON FLOWERING ALFALFA (*MEDICAGO SATIVA* L) AND CROWN VETCH *CORONILLA VARIA* L.

No 109

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As a side product of the research carried out in Czech Republic on insect pollination effectiveness in alfalfa and crown vetch interesting data illustrating relationships among various insect genera were obtained.
1. Generally – where several bee species occurred together, negative correlations were found between the abundance of both, the solitary bees and honeybees in various field situations.
2. Where abundance of M. rotundata increased in the time as a result of their emergence from cocoons brought to the field, the numbers of honeybees declined concurrently. Similar dependence occurred in the area: if M. rotundata bees' abundance decreased with the distance from their nests, the abundance of honeybees increased on the field parts less visited by the leaf cutting bees.
3. If abundance of both, M. rotundata and Rhophitoides canus females increased at the same time, the two species of wild bees divided with the field. The larger the distance from the nest, the lower the abundance of M. rotundata, and, consequently, the higher the numbers of R. canus was found on the field parts concerned.
4. On the flowering C. varia the negative correlation was found between the abundance honeybees and bumblebees (the group of B. terrestris, and B. lapidaries) during the cause of the days. Honeybees were most frequented at the warm noon hours, whereas bumblebees' numbers were highest in the morning and afternoon.
In the relations observed on alfalfa, the solitary bees seem to be the determinative factor. They trip flowers effectively what causes the cease of nectar secretion

and consequently the decline of attractiveness for honeybees. Then, honeybees concentrate on the field parts less covered by wild bees where the degree of pollination is lower. Paradoxically, in such cases even negative (naturally false) correlations between the abundance of honeybees and the seed yield were found.

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ENHANCING BEE POPULATIONS ON UK FARMLAND USING FORAGE MIXTURES.

No 110

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Populations of many species of bee in the UK have declined since the Second World War. Many species of solitary bee are now scarce or endangered, most arable areas now have only six of the twenty or so species of bumble bee, and managed honeybee populations are threatened by the parasitic mite Varroa destructor. This reduction in pollinators may threaten both the yield of arable crops that require insect pollination, and the survival of rare wild plant species. Reasons for the decline in bee populations are complex, but essentially habitat loss through arable intensification has led to a reduction in the supply of nectar and pollen for food, and suitable places for nest sites. Studies of suitable food plants for enhancing bee populations have been carried out by both Rothamsted and Monks Wood since the late 1980s, and have included various mixtures of both annual and perennial plants. The work has usually involved the use of small plots, which inevitably have limitations. One can, for example, easily demonstrate that such mixtures attract insect visitors, but it is difficult to prove that such plots are actually leading to long-term increases in populations, rather than simply diverting bees from other food sources. In order to answer some of these questions for bumblebees, a new five-year project (funded by defra and English Nature) has recently begun. Plots of different sizes have been sown with a mixture of plant species specified in the UK Countryside Stewardship Scheme "WM2 pollen and nectar mixture" at eight sites across England. These sites vary in farming intensity and landscape complexity from more intensive arable production in the east to more extensive, mixed farming further west. Regular observations of the bee species foraging on both the sown plots and the surrounding landscape are being undertaken, and non-destructive sampling techniques will allow genetic analysis of bees collected from the sites at the beginning of the project in order to estimate the size of existing bee populations, for comparison with samples collected four years after the establishment of the experimental plots. In addition, artificial will be placed adjacent to their growth rates compa should help to identify the required to sustain or enh and to better understand surrounding landscape on newly created habitats.

POLLINATOR DECLINE - ALARM & EPI

No 111

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Europe, along with sever experiencing marked dec services they provide. Ev highly fragmented and it consistent picture at the and some solitary bees h important providers of po extent of their contributi part of the ALARM proje has embarked on a long- large-scale environmenta of pollinators. The prima (1) Develop standardisec monitor pollinators and t (2) Quantify the distribut throughout Europe; (3) Determine the econc major pollinator groups; (4) Identify the primary c (5) Develop predictive m assessment.
ALARM is aiming to ach the construction of a kn to underpin future progr restoration and sustaina agricultural and natural e by quantifying the probl effectively target our res negative impacts of poll

CAN PLANTATION FOI FLORAL RESOURCES AUSTRALIA?

No 112

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