

NEW
Perspectives
ON
VARROA



Edited by
Andrew Matheson

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INJURIES TO QUEEN HONEY BEES IN COLONIES INFESTED WITH *VARROA JACOBSONI*

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INTRODUCTION

Many queen breeders store numbers of queen bees in so called 'queen banks'. However Woyke *et al.* (1956), Jasinski (1987), and Woyke (1988) showed that worker bees injured the queen bees when several of the latter were stored in a colony. This study was carried out to determine if the presence of *Varroa jacobsoni* has any effect on the injuries to queen bees.

METHOD

The investigations were conducted over three years in the Bee Division of the Agricultural University in Warsaw, Poland and in the Rijksstation voor Nematologie

en Entomologie in Merelbeke, Belgium. At first infestation of bee colonies by varroa was investigated. For that purpose the number of old varroa females in 300 sealed brood cells was determined. Next infested colonies were divided into two groups: one was left untreated as a control, and the other was treated against varroa. In Warsaw the colonies were fumigated with amitraz and in Merelbeke a strip of Apistan was introduced to the colonies.

To each queenless part, about 10 queens in nursery cages were introduced. One side of the cages was covered with wire gauze with apertures 2.5 mm across. The queens were examined for injuries after 2, 5 and 7 days of storage. The investigations were repeated in the two groups of 11 original bee colonies.

TABLE 1. Influence of *Varroa jacobsoni* (V) infestation on injuries of queen bees (Q).

Queen bees	Experimental period (days)					
	2		5		7	
	control	experimental	control	experimental	control	experimental
Number	110	111	110	111	110	111
Damaged (%)	38	56	59	77	70	85
Disabled (%)	23	36	39	55	50	64
Dead (%)	1	7	5	15	6	19

TABLE 2. Influence of *Varroa jacobsoni* infestation on injuries of queen legs.

Injuries	Experimental period (days)					
	2		5		7	
	control	experimental	control	experimental	control	experimental
Legs (number)	660	666	660	666	660	666
Legs damaged (%)	14	31	26	43	38	53
Legs disabled (%)	7	16	14	22	19	27

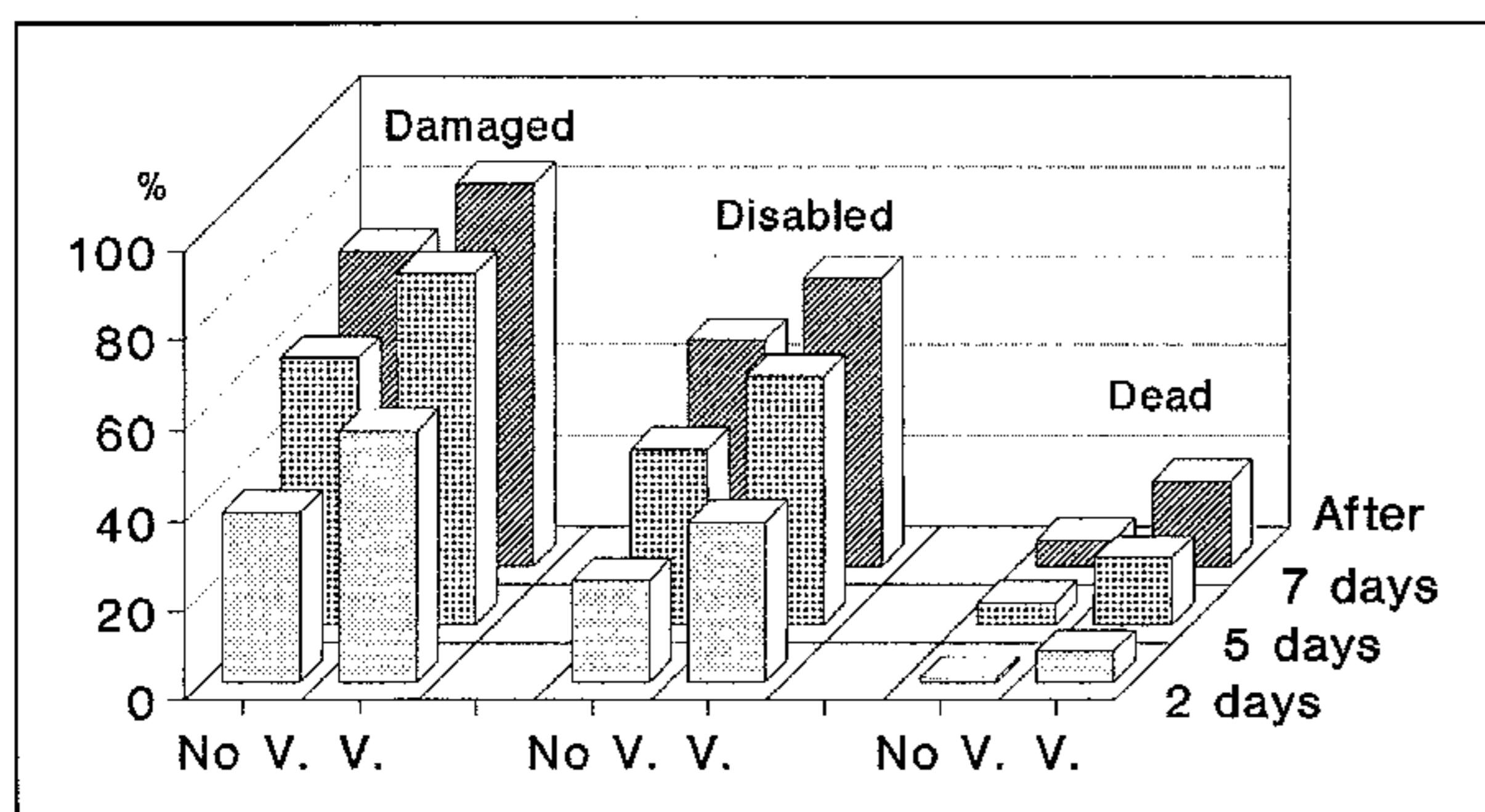


FIG. 1. Influence of *V. jacobsoni* infestation on injuries to queen bees.

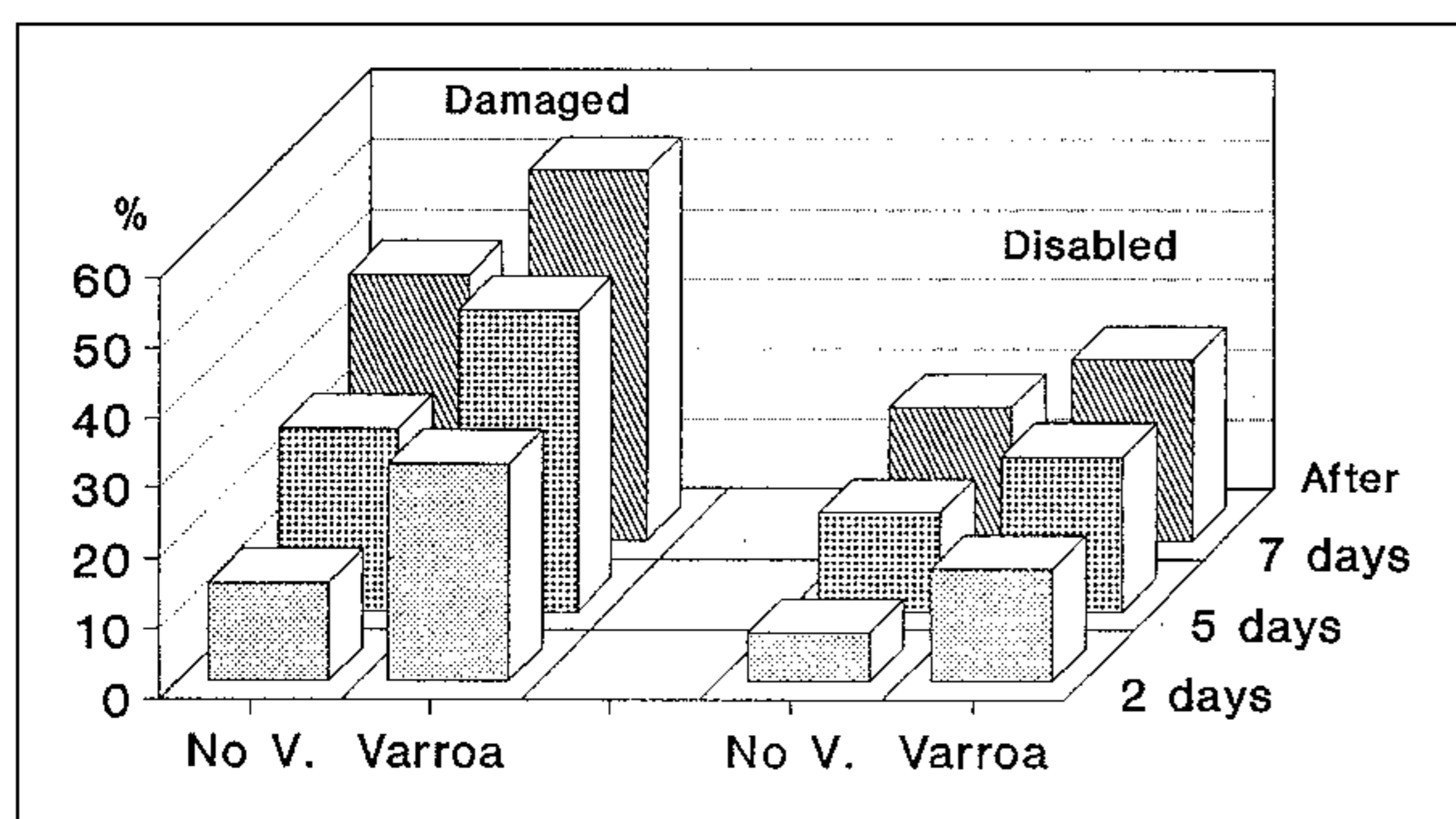


FIG. 2. Influence of *V. jacobsoni* infestation on injuries to queen legs.

RESULTS

The ratio of the number of adult varroa females to the number of sealed brood cells ranged from 13% to 23%.

The results presented in table 1 and figure 1 show that the workers injured the queens in both groups of bee colonies, the non-infested as well as the varroa-infested. The queens were injured after only two days of storage. On average 38% and 56% of queens were slightly injured (black spots on arolium, the whole arolium black, lack of one or two points of the claws, injuries of antennae or wings) in both parts of the colonies. However, 23% and 36% were heavily injured (lack of leg). Those queens are called disabled. After only two days of storage 1% and 7% of queens were dead. The table shows that the percentage of

injured queens as well as of dead ones was higher in varroa-infested colonies than in control colonies.

After five days the percentage of injured and dead queens was higher than after two days, and after seven days it was higher still. After seven days of storage 70% of queens were injured in colonies without varroa, and 85% in infested colonies. Table 1 and figure 1 show that the percentage of injured and dead queens was always higher in infested colonies than in the control. Differences between the percentages of injured and dead queens in colonies without and with varroa are statistically significant.

More detailed results concerning only injuries of legs are presented in table 2 and figure 2. After two days of storage 14% of queen legs were injured in infested colonies and as many as 31% in control colonies. After seven days of storage 38% and 53% respectively of queen legs were injured. When the period of storage was prolonged the percentage of injured legs increased. Statistical calculations showed that the percentage of injured legs was significantly higher in infested colonies than in the control group.

The results presented above show that the presence of varroa increases the percentage of injuries to queens stored in honey bee colonies.

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