

**Study: 2 Presentation title: “Commercial Fumigations of Wood in Czech Forests – First Experiences”
MBAO Conference, Orlando, November 2018**

Two studies were presented at the MBAO Conference. One was conducted as an efficacy study (150 m³), and another one was conducted to understand the EDN concentration in the stack and ambient (1496 m³).

In the case of the efficacy study, there was a mistake in the total volume presented at the MBAO. The actual volume was 86 m³, but it was presented as 150 m³.

The main purpose of the study conducted at 86 m³ was to determine the EDN efficacy against a natural population of the European spruce bark beetle (*Ips typographus*), six toothed spruce bark beetle or Spruce wood engraver (*Pityogenes chalcographus*), Hairy spruce bark beetle (*Dryocoetes autographus*) and Brown spruce longhorn beetle (*Tetropium fuscum*). During the treatment time, the EDN concentration inside the trap was measured.

1) Log characteristics:

In this study, Norway spruce (*Pices abies*) 4.1 m long and 0.19 m diameter average sized logs were used for the testing.

2) Determination of stack sizes

The total treatment volume was 86 m³.

3) Loading rates:

Loading factor was around 62% (i.e. around 53 m³ of wood in 86 m³ volume).

4) Fumigation dose:

50 g/ m³ for 10 hours

5) Methodology:

The logs were placed on a tarp, and the whole pile was covered with another tarp. The edge of the tarp was sealed with a sand snake. Two EDN application tubes were inserted into the prepared holes in the tarp. Monitoring lines were also inserted into the log pile to measure the EDN concentration during the treatment period. A total of 4.3 kg of the product was applied based on the change of cylinder weight placed on a scale. After the product application, the EDN concentration inside the tarp was measured by means of sample collection into gas tight bags and analysed in a GC (Shimadzu GC 171 device with TCD and FID detectors) at regular sampling intervals. The duration of the treatment was 10 hours. After the end of the treatment time, the remaining product was ventilated.

6) In stack concentration

Average EDN concentration measured 1-hour after the application was 63.91 g/ m³ which declined to half (31.46 g/ m³) after 2 hours. EDN concentration gradually declined over 10 hours of treatment inside the tarp. At the end of the treatment period, the average concentration was around 2.2 g/m³ (Figure 1).

7) Results:

A Ct product of 169 g h/ m³ was achieved for 10 hours treatment which provided 100% control of all the bark beetle species placed in the infested logs.

Table: 1 EDN concentration inside the tarp (Top section)

Time	EDN concentration g/ m ³ Top
9:20	0
10:20	62.42
11:11	50.46
12:11	36.24
12:31	32.76
13:11	26.72
14:15	16.04
14:31	14.74
15:31	10.22
16:31	6.7
16:51	5.4
17:31	4.6
18:31	3.05
18:51	2.75
19:31	1.97

Table: 2 EDN concentration inside the tarp (Middle section).

Time	EDN concentration g/ m ³ Middle
9:20	0
10:20	61.21
10:51	50.98
12:31	31.61
12:51	27.63
13:31	19.57
14:11	16.33
14:17	15.81
15:11	11.21
16:11	7.81
16:51	5.76
17:11	5.55
18:11	2.93
18:51	2.81
19:11	2.5

Table: 3 EDN concentration inside the tarp (Bottom section).

Time	EDN concentration g/ m ³ Bottom
9:20	0
10:20	67.8
11:31	42.91
12:31	26.53
14:51	9.3
15:51	7.6
16:51	4.72
17:51	3.08
18:51	2.13

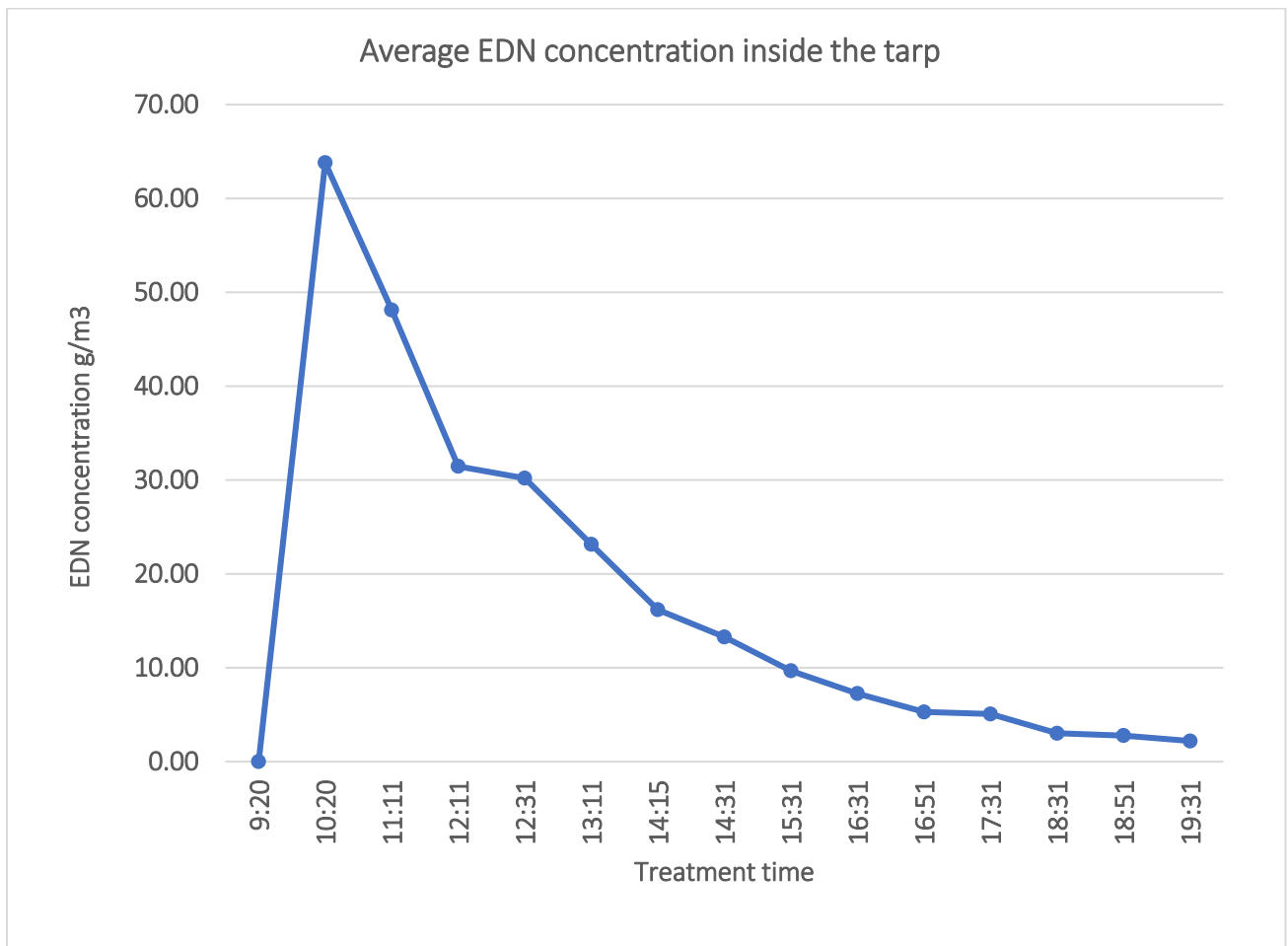


Figure: 1 Average EDN concentration inside the tarp over 10 hours treatment period