

# **COMPARATIVE TESTS BETWEEN CARLMARKS FLY TAPE, SILVA FLY TAPE FLY-END FLY STRING**

by  
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## **MOUNTING AND HANDLING**

None of the three products tested came with any materials for fixing the product to the brick wall.

The design of the installation systems for the Fly-End and Carlmarks products was very robust, and handling (unwinding unused fly string and winding up used fly string) was easy as well. Both systems also provided a blocking or stopping device to enable the user to stretch the string or tape taut (see Fig. 1 and 2).

The fly tape product of Silva, on the other hand, was extremely difficult to unwind, because each rotation caused twisting in the roll holder system (Fig. 3). As a result, a lot of force was required to carry on unwinding the fly tape, with the user also having to put pressure on to the roll holder system at the same time. The difficulties associated with unwinding this tape meant that the user constantly had to make adjustments to the fly tape or the rolls, and ended up with completely sticky hands or gloves. Furthermore, the Silva fly tape model is not equipped with any means of tensioning or blocking the rolls, with the result that it is impossible to stretch the tape taut. The user therefore had to put together a makeshift construction of his own (see Fig. 4).

## **EVALUATION OF THE EFFECTIVENESS OF THE FLY TAPES AND FLY STRING**

### **MATERIAL AND METHOD**

#### **Test 1**

Three large frames (2 x 1m inner dimensions) were mounted directly above tethered animals in a dairy stable. The frames were hung from the ceiling by means of metal hooks, allowing them to be taken down at any time (Fig. 5). The fly tapes respectively fly strings were then fixed to these frames (see Fig. 6), with the different fly tapes and fly strings being attached in different positions so as to exclude any possible advantage deriving from a specific position.

Frame 1: Position 1: Fly-End, P2: Carlmarks, P3: Silva, P4: Fly-End, P5: Silva, P6: Carlmarks  
 Frame 2: Position 1: Carlmarks, P2: Silva, P3: Fly-End, P4: Carlmarks, P5: Fly-End, P6: Silva  
 Frame 3: Position 1: Silva, P2: Fly-End, P3: Carlmarks, P4: Silva, P5: Carlmarks, P6: Fly-End

Depending on the size of the fly population, the number of flies caught were counted after 2-3 weeks, and the tapes and strings were then renewed. A proportion the flies caught were set aside and divided into stinging and non-stinging flies.

### Test 2

The fly tapes and fly strings were mounted for a real-life test in line with the manufacturer's instructions in a stable with tethered oxen on the one hand and suckler cows on the other hand. One area of the stable was used to accommodate tethered oxen, and was separated by a barrier from the remainder of the stable, which was used as a pen for untethered suckler cows. In the pen area there were resting and feeding boxes and, in the middle, an exit for the animals, which led to a paddock area, and was partially shut by plastic aprons (Fig. 7,8). The fly tapes and fly strings were stretched across the entire length of the stable (see Fig. 8), so that they were stretched both above the tethered oxen as well as in the pen area, above the resting boxes. The individual tapes or strings were spaced about 0.8 - 1.0 m apart. One week after setting up fresh tapes or strings, the number of flies caught per metre in different areas of the stable was counted. (Area A = tethered oxen; Area B = exit to paddock area; Area C = resting and feeding boxes in the pen; see Fig. 8). The tapes were then unwound further, so that there was another set of fresh tapes and strings throughout the entire stable area.

## RESULTS

### Test 1 (see Tables 1 - 4)

The total number of flies caught and the number of top scores achieved in the different positions in frames 1-3 are set out in Tables 1-3.

In frame 1, the Silva and Carlmarks fly tapes only caught 74.8% and 55.7% respectively of the Fly-End catch rate; the figures for frame 2 were 79.5% and 66.5% respectively. In frame 3, however, the Silva and Fly-End products achieved virtually identical values (100% Silva, 99.2% Fly-End), whilst here, too, the Carlmarks product caught far fewer flies (76.8%).

Over all three frames, the "Fly-End" strings caught the greatest number of flies. Over 10 counts, for example, Fly-End achieved the highest fly catching score 8 times in frames 1 and 2 respectively, and 6 times in frame 3. Silva, on the other hand, scored highest 2 times in frames 1 and 2 respectively, and 4 times in frame 3. In comparison with the other products, the Carlmarks fly tapes did not achieve the top score in any of the counts (Table 4). The position of the fly tapes or strings was not observed to have any impact on the result.

Viewed in terms of percentages, the Silva and Carlmarks products achieved only 84% and 65.9% respectively of the Fly-End catch rate (Table 4). When the results of frames 1 and 2 were statistically evaluated using the t-test, a significant difference ( $p < 0.05$ ) was identified each time for the Fly-End product compared with the Carlmarks and Silva products. In

frame 3, there was a significant difference between Fly-End and Carlmarks, but not between Fly-End and Silva.

On average, approx. 80% of the counted out flies were of the stinging variety, and approx. 20% of the non-stinging variety.

### Test 2

The results of the real-life test were similar to those obtained in Test 1 (see Table 5). Here, too, Fly-End caught the greatest numbers of flies in all the areas. As was expected, the number of flies caught was highest in area A, which was permanently occupied by animals (tethered oxen), whilst far fewer flies were caught in area C (resting and feeding boxes), which is only used infrequently, particularly in the summer, and then only on a temporary basis. Over 10 counts in each area, the Fly-End and Silva products achieved top scores in area A 9 times and 1 time respectively, 7 times and 3 times respectively in area B, and 4 times and 6 times respectively in area C. As in Test 1, the Carlmarks product never achieved a top score (Table 5).

In total, the Silva and Carlmarks fly strips achieved only 74.6% and 71.6% respectively of the score achieved by Fly-End in area A, 69.9% and 64.6% respectively in area B, and 99.7% and 71.5% respectively in area C (Table 5).

When the results were tested for significance using the t-test, a significant difference ( $p < 0.05$ ) was also found here in areas A and B between the Fly-End model and the Carlmarks and Silva products. In area C, however, the only significant difference observed was between Fly End and Carlmarks.

## CONCLUSIONS

- The “Fly-End” fly string system achieved the best assembly, handling and effectiveness results, and out-performed the “Carlmarks” and “Silva” tapes in certain areas by up to 30 - 35%.
- The “Silva” fly tape system exhibited significant weaknesses, especially in relation to handling; the unwinding operation, in particular, was very difficult. In our case, we were not able to suspend the roll holder from the ceiling, which the company recommends as the “most effective” solution, although this would not have alleviated any of the described mechanical difficulties. Furthermore, if we had suspended the roll holder from the ceiling, we would only have been able to continue unwinding the strip with the aid of a ladder, etc.
- The “Carlmarks” fly tape system achieved the same good results as “Fly-End” as regards assembly and handling, but caught fewer flies than both “Fly-End” and “Silva” in all tests.
- Whilst “Fly-End” and “Carlmarks” indicate in their assembly instructions or in packing inserts that some birds (especially swallows) may get caught in the strips, “Silva” does not mention this at all. In particular, tapes or strings that are installed too far below the

ceiling, or tapes that are not taut, are a constant attraction to swallows, which like to land on them. When this happens, they usually need human help to get free again.

- The “Fly-End” and “Carlmarks” products are equipped with blocking pins or hooks which allow the user to stretch the tapes and strings taut. There is no such mechanism on the “Silva” product, and the user was only able to stretch the tape taut by putting together his own makeshift construction. Furthermore, the Fly-End string appears to be less elastic, because it was still stretched completely taut even after many days, whilst the two other tapes were visibly limp, despite the tensioning devices, after just a few days.

## SUMMARY

### Fly-End Fly String System

- best fly-catching result
- good handling
- can be stretched taut using the blocking pin; strings remained taut over several weeks
- warning about risk to birds

### Silva Fly Tape System

- second-best fly-catching result
- poor handling
- no tensioning device, strip slackens and hangs limp in spite of makeshift blocking mechanism
- no warning about risk to birds

### Carlmarks Fly Tape System

- far poorer fly-catching results than Fly-End and Silva
- good handling
- can be stretched taut using the blocking hook; strip still slackens after some time and hangs limp
- warning about risk to birds

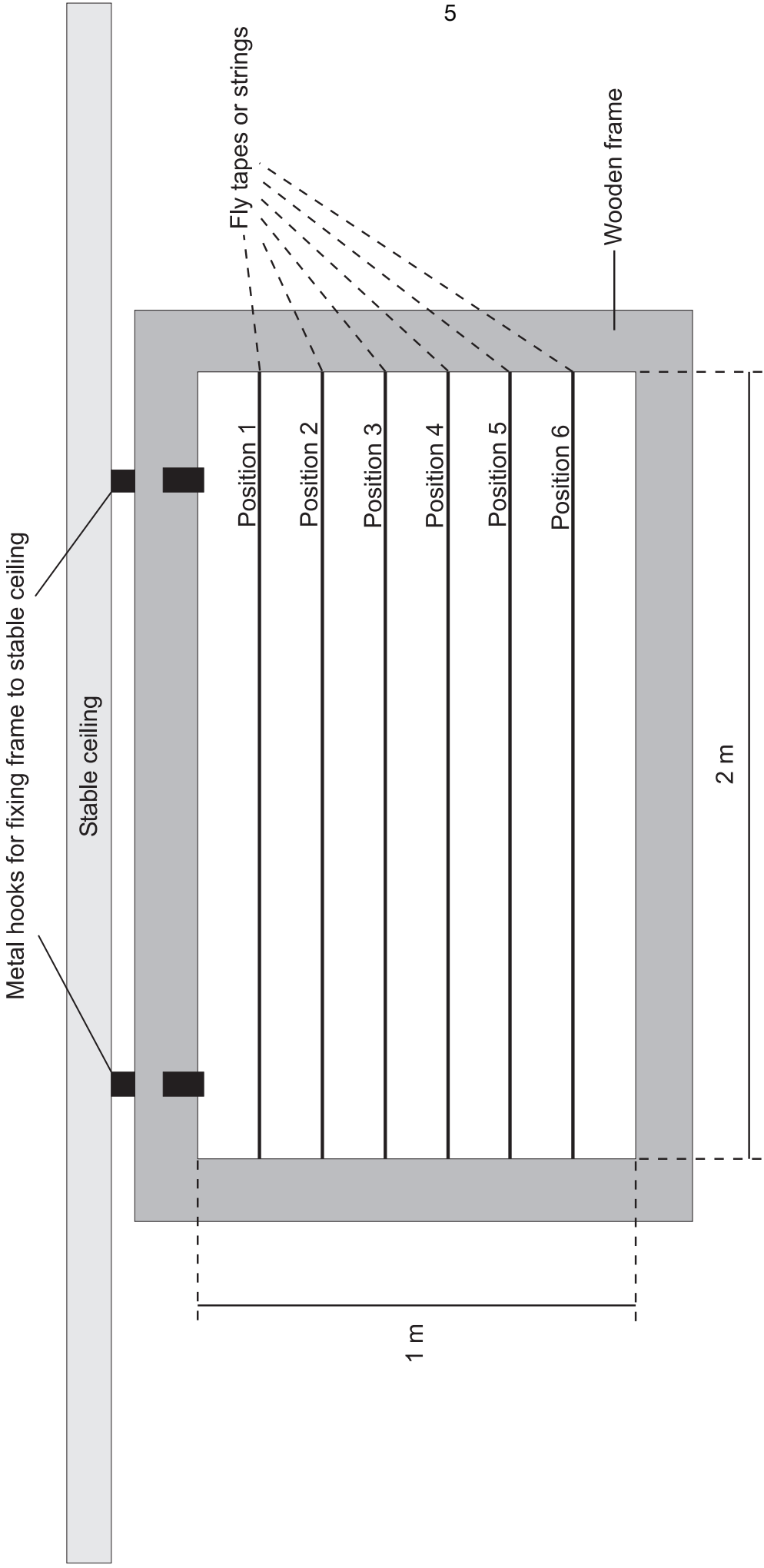


Fig. 6: Construction of the catching frames, means of fixing frames to the stable ceiling and positioning of the fly taps and fly strings (Test 1).

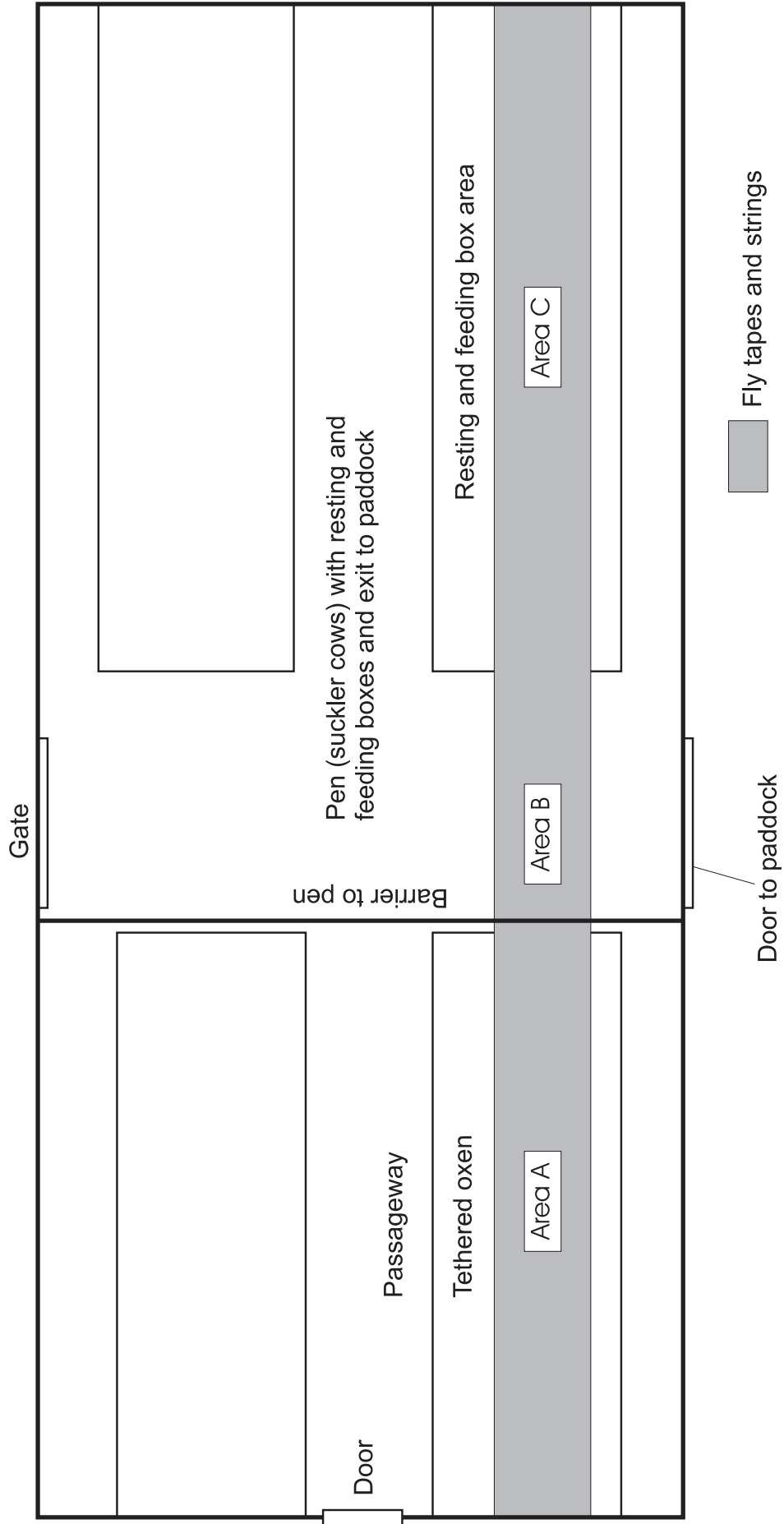


Fig. 8: Real-life test - Haidlhof farm: Stable layout (Test 2) and location of fly tapes and strings

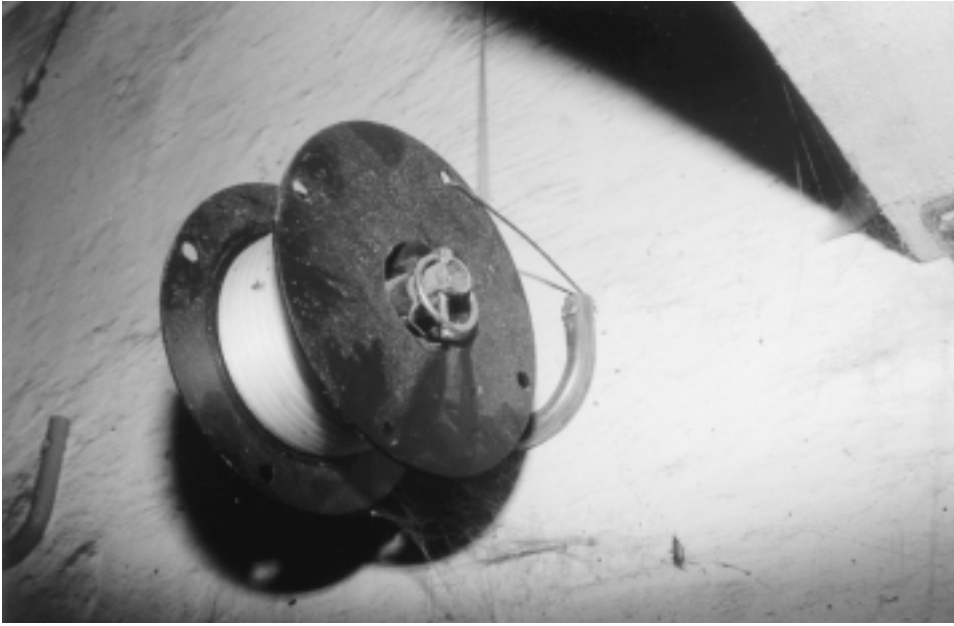


Fig. 1 Tensioning/blocking device (arrow) on the Carlmarks fly tape system.

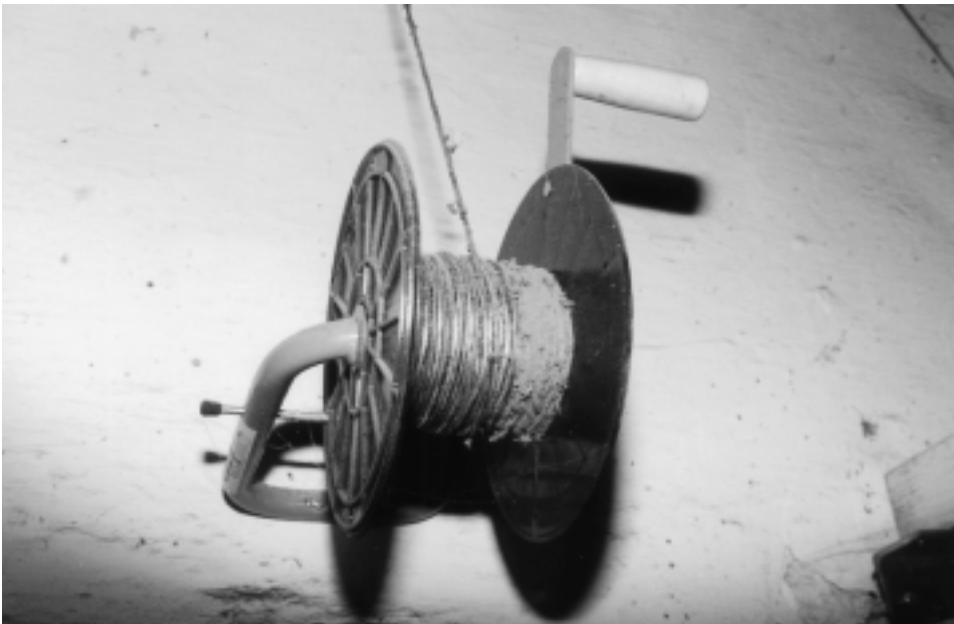


Fig. 2 Tensioning/blocking device (arrow) on the Fly-End fly string system.

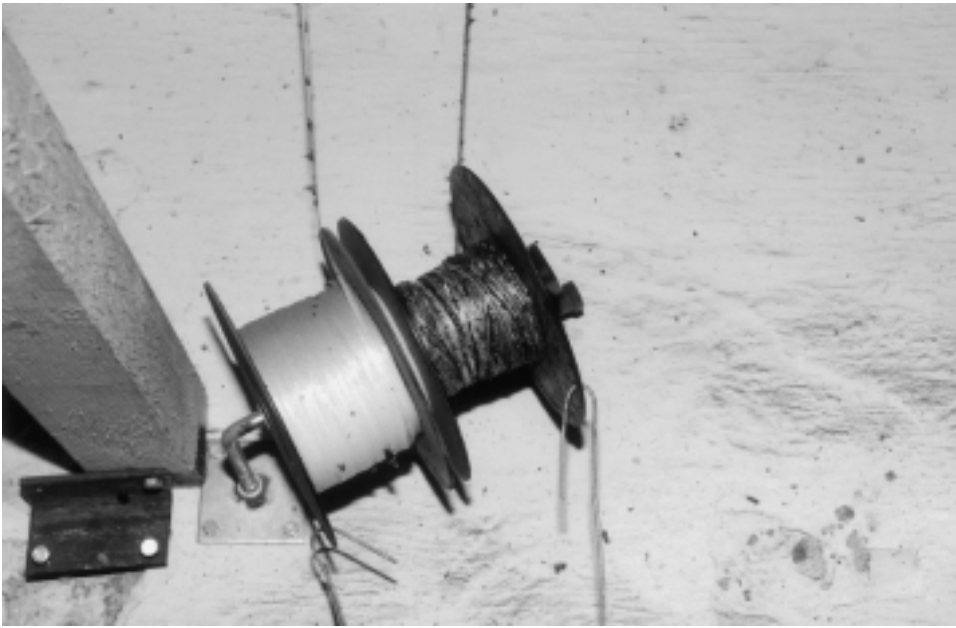


Fig. 3 Twisting occurring in the roll holder when the tape on the Silva system is unwound.

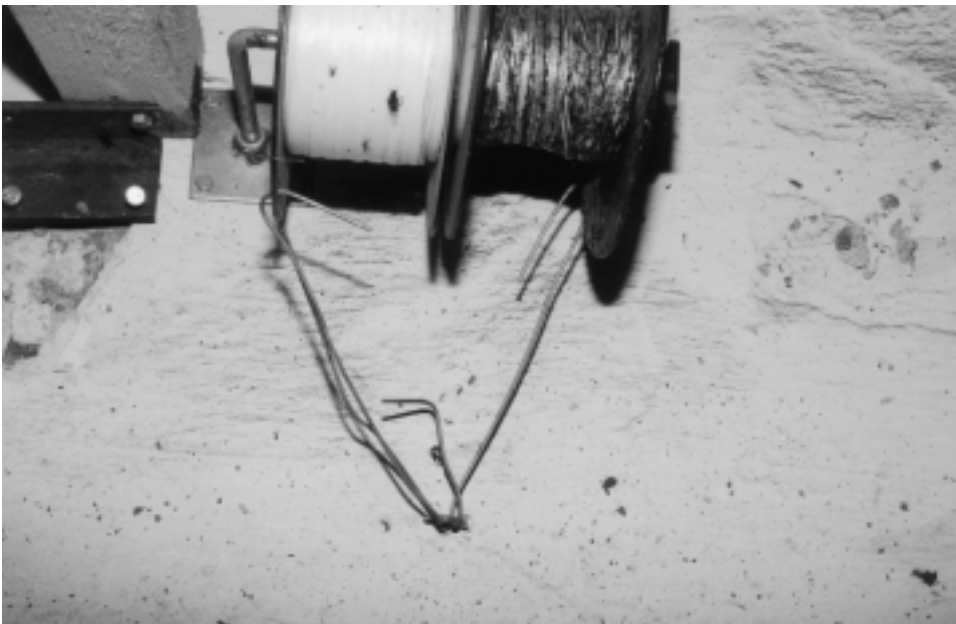


Fig. 4 Self-built tensioning/blocking device (arrow) for the Silva fly tape system.





Fig. 5 Arrangement and construction of the fly-catching frames (Test 1).



Fig. 7 View of stable in real-life test at the Haidlhof farm (Test 2): from front to back: tethered oxen, exit to paddock, resting boxes.

<b>Frame 1</b>	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Products tested	Fly-End	Carlmarks	Silva	Fly-End	Silva	Carlmarks
Company	Fly-End Production s.r.o.	AB P A Carlmark	Silva Miljö AB	Fly-End Production s.r.o.	Silva Miljö AB	AB P A Carlmark
25.10.1996	22	19	13	<b>24</b>	21	13
3.2.1997	61	53	28	<b>64</b>	34	30
20.6.1997	30	9	<b>32</b>	29	14	16
11.7.1997	64	10	26	<b>65</b>	27	31
25.7.1997	83	15	31	<b>87</b>	38	28
14.8.1997	75	12	28	<b>77</b>	41	37
5.9.1997	<b>169</b>	108	155	150	123	65
19.9.1997	<b>103</b>	98	55	75	82	98
2.10.1997	<b>394</b>	217	262	284	287	161
17.10.1997	204	118	<b>220</b>	198	173	120
<b>Total</b>	<b>1205</b>	<b>659</b>	<b>850</b>	<b>1053</b>	<b>840</b>	<b>599</b>
<b>Average value</b>	<b>120,5</b>	<b>65,9</b>	<b>85,0</b>	<b>105,3</b>	<b>84,0</b>	<b>59,9</b>
Number of top scores over 10 counts	<b>3</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>0</b>

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Table 1: Numbers of flies caught on individual test days, totals, average values and number of top scores over 10 counts in comparison to the other positions.

<b>Frame 2</b>	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Products tested	Carlmarks	Silva	Fly-End	Carlmarks	Fly-End	Silva
Company	AB P A Carlmark	Silva Miljö AB	Fly-End Production s.r.o.	AB P A Carlmark	Fly-End Production s.r.o.	Silva Miljö AB
25.10.1996	15	28	36	19	<b>41</b>	23
3.2.1997	62	70	<b>103</b>	47	62	54
20.6.1997	14	<b>17</b>	11	13	14	10
11.7.1997	67	69	109	71	<b>114</b>	84
25.7.1997	59	65	77	68	<b>84</b>	63
14.8.1997	74	72	115	75	<b>119</b>	66
5.9.1997	56	61	93	58	<b>98</b>	53
19.9.1997	151	185	<b>208</b>	114	182	126
2.10.1997	167	265	263	161	<b>289</b>	208
17.10.1997	157	<b>226</b>	197	173	223	193
<b>Total</b>	<b>822</b>	<b>1058</b>	<b>1212</b>	<b>799</b>	<b>1226</b>	<b>880</b>
<b>Average value</b>	<b>82,2</b>	<b>105,8</b>	<b>121,2</b>	<b>79,9</b>	<b>122,6</b>	<b>88,0</b>
Number of top scores over 10 counts	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>0</b>

Table 2: Numbers of flies caught on individual test days, totals, average values and number of top scores over 10 counts in comparison to the other positions.

<b>Frame 3</b>	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Products tested	Silva	Fly-End	Carlmarks	Silva	Carlmarks	Fly-End
Company	Silva Miljö AB	Fly-End Production s.r.o.	AB P A Carlmark	Silva Miljö AB	AB P A Carlmark	Fly-End Production s.r.o.
25.10.1996	21	16	26	18	7	46
3.2.1997	48	47	62	43	17	73
20.6.1997	32	29	10	24	20	16
11.7.1997	54	81	44	35	33	52
25.7.1997	43	87	39	42	44	58
14.8.1997	58	92	51	47	62	73
5.9.1997	81	96	69	85	65	89
19.9.1997	271	223	256	273	204	155
2.10.1997	242	221	183	196	121	214
17.10.1997	162	129	65	138	92	101
<b>Total</b>	<b>1012</b>	<b>1021</b>	<b>805</b>	<b>901</b>	<b>665</b>	<b>877</b>
<b>Average value</b>	<b>101,2</b>	<b>102,1</b>	<b>80,5</b>	<b>90,1</b>	<b>66,5</b>	<b>87,7</b>
Number of top scores over 10 counts	3	4	0	1	0	2

Table 3: Numbers of flies caught on individual test days, totals, average values and number of top scores over 10 counts in comparison to the other positions.

Products tested	<b>Fly-End</b>	<b>Silva</b>	<b>Carlmarks</b>
Company	Fly-End Production s.r.o.	Silva Miljö AB	AB P A Carlmark
Frame 1, total	2258	1690	1258
Percentage of maximum, Frame 1	100%	74,8%	55,7%
Number of top scores over 10 counts	8	2	0
Frame 2, total	2438	1938	1621
Percentage of maximum, Frame 2	100%	79,5%	66,5%
Number of top scores over 10 counts	8	2	0
Frame 3, total	1898	1913	1470
Percentage of maximum, Frame 3	99,2%	100%	76,84%
Number of top scores over 10 counts	6	4	0
<b>Frames 1-3, total</b>	<b>6594</b>	<b>5541</b>	<b>4349</b>
<b>Percentage of maximum, Frames 1-3</b>	<b>100%</b>	<b>84%</b>	<b>65,9%</b>
<b>Number of top scores over 30 counts</b>	<b>22</b>	<b>8</b>	<b>0</b>

Table 4: Total numbers of flies caught, percentage of respective maximum value and number of top scores achieved in comparison with the products over 10 and 30 counts using frames 1-3.

Area	Area A			Area B			Area C		
Product	Fly-End	Silva	Carlmarks	Fly-End	Silva	Carlmarks	Fly-End	Silva	Carlmarks
Company	Fly-End Production s.r.o.	Silva Miljö AB	AB P A Carlmark	Fly-End Production s.r.o.	Silva Miljö AB	AB P A Carlmark	Fly-End Production s.r.o.	Silva Miljö AB	AB P A Carlmark
1	<b>485</b>	304	425	<b>274</b>	195	145	255	<b>291</b>	122
2	<b>428</b>	252	323	<b>244</b>	214	158	<b>236</b>	203	135
3	286	<b>288</b>	220	<b>108</b>	91	88	170	<b>217</b>	143
4	<b>239</b>	223	186	93	<b>94</b>	47	164	<b>168</b>	160
5	<b>348</b>	288	289	<b>430</b>	164	198	<b>170</b>	135	158
6	<b>374</b>	230	271	<b>370</b>	181	223	<b>192</b>	148	162
7	<b>390</b>	273	234	<b>340</b>	168	257	113	<b>135</b>	96
8	<b>425</b>	257	253	<b>383</b>	263	248	96	<b>100</b>	58
9	<b>406</b>	354	302	268	<b>286</b>	253	<b>132</b>	119	63
10	<b>487</b>	418	267	198	<b>237</b>	132	107	<b>114</b>	72
<b>Total</b>	<b>3868</b>	<b>2887</b>	<b>2770</b>	<b>2708</b>	<b>1893</b>	<b>1749</b>	<b>1635</b>	<b>1630</b>	<b>1169</b>
<b>% of max.</b>	<b>100%</b>	<b>74,6%</b>	<b>71,6%</b>	<b>100%</b>	<b>69,9%</b>	<b>64,6%</b>	<b>100%</b>	<b>99,7%</b>	<b>71,5%</b>
<b>No. of top scores</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>6</b>	<b>0</b>
Product	Fly-End			Silva			Carlmarks		
Company	Fly-End Production s.r.o.			Silva Miljö AB			AB P A Carlmark		
<b>No. of top scores</b>	<b>20</b>			<b>10</b>			<b>0</b>		

Table 5: Real-life test - Haidlhof farm (Test 2): number of flies caught (top scores shown in bold print) per metre of fly tape or string in areas A-C (see Fig. 8), total numbers of flies caught, percentage of respective maximum value (% of max.), number of top scores achieved (no. of top scores) by the products tested in the areas A, B and C, and throughout all the areas overall (no. of top scores).