MINISTERIE VAN LANDBOUW

Bestuur voor Landbouwkundig Onderzoek
Kommissie voor Toegepast Wetenschappelijk
Onderzoek in de Zeevisserij (T.W.O.Z.)

(Voorzitter : F. LIEVENS, directeur-generaal)

PRELIMINARY RESEARCH

WITH A DOUBLE NET

G. VANDEN BROUCKE, A. VAN MIDDELEM and
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Onderwerkgroep «Techniek in de Zeevisserij»

Mededelingen van het Rijksstation voor Zeevisserij (C.L.O. Gent)
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D/1973/0889/8

INTRODUCTION.

At certain periods of the year it pays during the fishery on shrimps to fish also for roundfish. Based on the experience that shrimp vessels using higher trawl heads catch more roundfish than the others a net was designed suited to carrying out both fisheries simultaneously. This report covers the results of a preliminary research with a double beam net, carried out aboard the fisheries research vessel "Hinders".

The first paragraph explains the aim of the research. The second describes the experimental conditions. The third gives a review of the measurements and discusses the results.

§ 1. Aim.

In order to increase the catch capacity of the traditional shrimp trawls as regards roundfish a net was designed which on the one hand conforms to the present norms with respect to the catch during the shrimp fishery and on the other aims at catching roundfish.

§ 2. Experimental conditions.

1. Vessel.

The fisheries research vessel "Hinders" has a length of 21 m, a width of 6.44 m and a depth of 2.90 m. The tonnage amounts to 78 BT and the motor develops 240 h.p.

The vessel was built as a side trawler but was later transformed for the beam trawl fishery. The ship carries a four-drum winch controlled from the deck.

2. Fishing gear.

a) The net.

The characteristics of the tested net adapted to vessels of 150 to 200 h.p. are presented in figures 1 and 2 and in tables 1 and 2.

The net is made of polyamide yarn with 500,680 and 1250 R tex and consists of two parts, the lower net (shrimp net) and the upper net (fish net).

The fish net and the shrimp net have a headline of 6 m length whereas the groundrope of the shrimp trawl measures 7.40 m.

The inner cutting of the net is characterized by a taper ratio 1T2B.

The double net has four different tapes ratios, viz. N, 1N2B, 1N3T and 1T2B.

For the shrimp net and the fish net the taper ratios are N, 1N2B, 1T2B and N, 1N3T, 1N2B respectively.

The mesh width of the upper net is 80 mm for the whole length of the net and 75 mm for the codend.

b) The rigging.

The vertical opening of the net during the shrimp fishery with beams is determined by the height of the trawl heads amounting to 0.80 m. The beams were devised for a net with a headline of 6 m.

The kites used are equipped with a float and flexible grip brackets and are made of waterproof multiplex (width 70 cm and length

50 cm). The kites have as aim to stretch and to pull upwards the headline of the upper net.

As shown in figures 3 and 4, the lower net, the shrimp net is fastened in the usual manner to the beam. The upper net fastened to the lower net is fixed by means of two legs to the warp and drawn back by the two kites. The legs measure 9.10 m and are made of cable with a diameter of 10 mm.

3. Fishing area.

The experiments took place off the Belgian coast and more especially on the Great Stream Bank and the Wenduine Bank.

The fishing areas are shown in figure 5.

§ 3. Results.

The results of the comparative fishing experiments are given in table 3.

A comparison between the catches obtained by the conventional net rigged on port and the double net on starboard show them to be very divergent.

On a total of 24 trips, 6 were eliminated due to the scanty catch. Of the 18 remaining trips, 16 yielded a larger catch for the double net as regards roundfish (varying between 51 and 94 % of the total catch), whereas each trip yielded approximately the same catch of shrimps.

With respect to the repartition of the catch in the double net, 11 trips yielded a larger catch in the upper net (varying between 53 and 91 % of the total catch).

During these experiments the tension in the warps was also measured.

For the double net a drag of ± 595 kg was noted and for the conventional net ± 450 kg (figure 6).

The tension was always higher for the double net (25 % to 45 %).

Due to the hydraulic lift of the upper net during fishing more warp had to be veered (± 10 m) for a depth of 10 à 20 m.

CONCLUSIONS.

The results of the experiments show a general trend towards larger catches of roundfish for the double net and especially for the upper part.

Previous experiments have established that a beam net with taper ratio 2/3 encounters less drag than a beam net tapered ½.

A series of experiments is being planned as regards the warp tension of the double beam net. Comparative fishing experiments will be carried out between a net tapered ½ and 2/3.

During the preliminary experiments no difficulties were encounterd during the handling of the fishing gear.

Table 1 - Characteristics of the double net (shrimp net)

Part of the net		A1	A2	A3	C	D	E	F	F1
Material		PA	PA	PA	PA	PA	PA	PA	PA
Colour		white	white	white	white	white	white	white	white
Length of mesh in mm		40	40	40	32	20	18	40	32
Breaking load of yarn in kg		30	30	30	30	30	30	30	30
Titre in tex		680	680	680	680	680	680	680	680
Length of headline		6 m							
Length of groundrope		7,40 m							
Number of meshes upper side		3,60	26	304	325	360	136	80	30
Number of meshes lower side		260	110	260	225	136	136	30	8
Depth of netpieces		100	55	45	100	224	200	100	44
Cutting rate	outer	1N2B	1N2B	1N2B	1N2B	1N2B	N	1N2B	1N2B
	inner		1T2B					N	N
Taper rate	outer	½	½	½	½	½	0/1	½	½
	inner		2/1					0/1	0/1

Table 2 - Characteristics of the double net (fish net)

Part of the net		A1	A2	C1	C2	D1	D2
Material		PA	PA	PA	PA	PA	PA
Colour		white	white	white	white	white	white
Length of mesh in mm		80	80	80	80	70	70
Breaking load of yarn in kg		20	20	20	20	120	120
Titre in tex		500	500	500	500	1250 (x2)	1250 (x2)
Length of headline		6 m					
Length of groundrope							
Number of meshes upper side		190	10	176	100	40	24
Number of meshes lower side		176	45	30	20	40	8
Depth of net pieces		14	15	146	160	40	16
Cutting rate	outer	1N2B	1N2B	1N2B	N	N	1N2B
	inner		1N3T		1N2B		
Taper ratio	outer	½	½	½	0/1	0/1	½
	inner		3/1		½		

Table 3 - Repartition of roundfish catches

Number of trip	Total catch (port and starboard = 100 %)		Total catch double net = 100 %	
	Comparision of catches between		Comparision of catches between	
	conventional net	double net	lower net	upper net
1	49 %	51 %	47 %	53 %
2	25 %	75 %	25 %	75 %
3	29 %	71 %	20 %	80 %
4	31 %	69 %	32 %	68 %
5	48 %	52 %	46 %	54 %
6	41 %	59 %	35 %	65 %
7	34 %	66 %	33 %	67 %
8	catches too small			
9	52 %	48 %	52 %	48 %
10	catches too small			
11	6 %	94 %	5 %	95 %
12	17 %	83 %	42 %	58 %
13	86 %	14 %	29 %	71 %
14	catches too small			
15	40 %	60 %	81 %	9 %
16	catches too small			
17	5 %	95 %	3 %	97 %
18	catches too small			
19	45 %	55 %	80 %	20 %
20	38 %	62 %	74 %	26 %
21	46 %	54 %	57 %	43 %
22	46 %	54 %	70 %	30 %
23	41 %	59 %	85 %	15 %
24	catches too small			