

## THE RESPONSE OF CATTLE EGRET, (*Bubulcus ibis*) TO INTEGRATED BIRD MANAGEMENT METHODS UNDER KAFR EL-SHEIKH GOVERNORATE CONDITIONS

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### ABSTRACT

The reactions of cattle egret bird to some integrated bird management are observed under the conditions of Kafr El-Sheikh Governorate. The obtained results revealed that the repellent effect differed considerably according to the type of the treatment. When exploder applied 4 times/day at the interval of 7-10 days monthly during the dawn departure or evening return period, the effectiveness of exploder method was greatest in dispersing egrets from fruit orchard as the reduction percentage reached to 79%, and proved to be the most effective one while nest destruction represented the second rank in dispersing cattle egret and prevent damage to poultry farm with reduction rate 61.9%. On the other hand, using a few dead egrets place in clear view around the roosts, as a method to control egrets in nursery, was the less effective (13.25%) and failed to prevent congregation during breeding season. Eco-biological aspects of egrets under these different treatments were also observed. The percentage of nested trees were the lowest one in exploder (53.3%) while nest destruction and dead egret methods were 60 and 66.6% respectively compared with untreated area 80%.

Also, percentage of nests with eggs or eggs and nestlings were also affected with methods of control, as the maximum adverse effect was noticed with exploder followed by nest destruction and dead egret respectively compared with untreated area.

### INTRODUCTION

The cattle egret *Bubulcus ibis* is a gregarious, white chicken-sized bird easily recognized by its foraging association with grazing animals. The cattle egret's Arabic name, Abu Qerdan, means (Father of Ticks) and refers to the abundance of ticks in Egyptian heronries (Telfar, 1994). Large colonial population and egret feeding behavior have caused problems in several locales (Dusi, 1979, 1981). Also, cattle egret is regarded as beneficial bird for human by catching harmful insects and small mammals, it is also considered as a noxious when feeds on beneficial insects/or small animals. These insects and small animals play an important role in the field of biological control, in addition to the losses in fruit orchards when it breeds and nests in the trees.

The highest percentage of damage by cattle egret to flowers and fruits of orange resulting from their breeding and nesting on orange trees was 12.2% for orange flowers and 6.7% when the fruits matured (El-Deeb, 2000), (Kramer, 1975) previously indicted that droppings of many herons destroy plants near the nested trees and may also damage the trees themselves. This paper describes the behavioral response of cattle egret and nesting success to integrated bird management.

## **MATERIALS AND METHODS**

### **Study areas:**

The present work was conducted at Kafr El-Sheikh Governorate, which occupies the northern site of Delta during the breeding season of 2002. Three areas, where cattle egret lived, are used to control by three methods and the fourth one are used without any treatment as a check control, i.e.

#### **I. Fruit orchard:**

The selected fruit orchard occupied an area of about 50 feddans at Shinno Village. The cultivated fruit trees of this orchard are sweet orange, mandarin, lemon and naval orange. The orchard is surrounded by casuarina and eucalyptus trees. The colony of egret are nested on this trees.

#### **II. Poultry farm:**

Which located in Faculty of Agricultures, Kafr El-Sheikh. Many egrets are nested on the casuarina trees surrounding the farm and cause economic losses both by direct damage to poultry production by defecation or burn the trees which nested on it.

#### **III. Nursery:**

Nursery of the Kafr El-Sheikh Governorate, about 3 feddans, different ornamental plants are planted in it and surrounded by casuarina and eucalyptus trees which used as a roosts for egrets. Egret cause damage to these plants by defecation on it.

#### **IV. Farm of Sakha experimental station:**

Which occupies an area of about 1.000 feddan. Different trees are growing in the farm, especially casuarina and eucalyptus which considered as a roosts for cattle egrets nesting. This area are used as a check control.

### **Used IBM technique:**

The following three methods of IBM were applied:

#### **1. Freighting explosions:**

Experiments were carried out in the first area (fruit orchard) during the breeding season of 2002 (March-August) by using shotgun patrol, generally consisting of single person who shot towards egrets in attempt to disperse roosting congregation. The exploder was applied 4 times/day, 15 minutes among at the intervals of 7-10 days monthly during the dawn departure or evening return period (Slater, 1980).

During the control phase the population of egrets were monitored and accessed by counting the individuals twice/day at sunrise and sunset, each count lasted an hour for four successive days. The population counts of cattle egret was conducted from a high place using the field glass binocular (Paton *et al.*, 1986). In the same chosen trees, nests and nesting were also monitored monthly during the breeding season (March-August) and some measurements were considered, i.e. percentage of nested trees, number of

empty nests, nests with only eggs and with eggs and nestlings.

## **2. Nest destruction of cattle egret:**

In poultry farm (the second area), experiments also has been run during the breeding season of 2002 (March-August). Nests were monthly destroyed using long pole with a large hook at the end. During the treatment period the population of egrets were also monitored and counted monthly and the previous measurement concerning with nests and nesting were also considered. The destroyed nests were cleaned and fired to prevent birds from reusing the material.

## **3. Dead egrets:**

In nursery area and during the breeding season of 2002 we used a new method to disperse egret roosts on trees surrounded the nursery by shooting a few birds and leaving the carcasses fixed by rope from its legs and placed it in a clear view at several locations around the roosts specially along the fly way. The population of egrets were also monitored monthly and counted. Also, nests and nesting were monitored and examined as the previous measurements.

In addition to these, the cattle egret which roosted on the trees growing in the farm of Sakha Experimental Station left without treatment as a check control, and the same eco-biological aspect were investigated.

# **RESULTS AND DISCUSSION**

## **1. Effect of freighting explosions:**

### **1.1. On population dynamics:**

A maximum of 200 egrets were inhabited fruit orchard in March 2002 before the beginning of applying this method. Fig. (1) illustrates that when the exploders used in that time with daily repeated attempts for successive 7 days, about of 165 egrets were remained at the colony and the rest ones were run away. The second attempt which applied during May had not any adverse effect on birds (160 bird), while the third one during June obviously declined the number of egrets roosted at fruit orchards to be 110 individual. Repeating this method during July and August drastically reduced the roosting egrets on the trees to be 52 and 42 birds respectively. The reduction on numbers of egrets due to freighting explosions treatment during the experimental period was obviously observed when compared with those roosting at Sakha Experimental Station without treatment, as reduction percentage were 79% under the pressure of the shooting method, while a noticeable increase in numbers of roosting birds in untreated area was observed to be 20% enhancing.

Slater, 1980 mentioned that the propane exploder was probably the most common method used in Ohio for repelling blackbirds from corn, and he found that this method proved to be the most effective one. Also, these findings are in agreement with that reported by Wilson, 1993 who mentioned that when exploder was applied at sunrise and sunset for ten successive days

in some crops, gees did not approach the treated areas during the treatment period, and its effect extended over 5 days after treatment period at all tested fields.

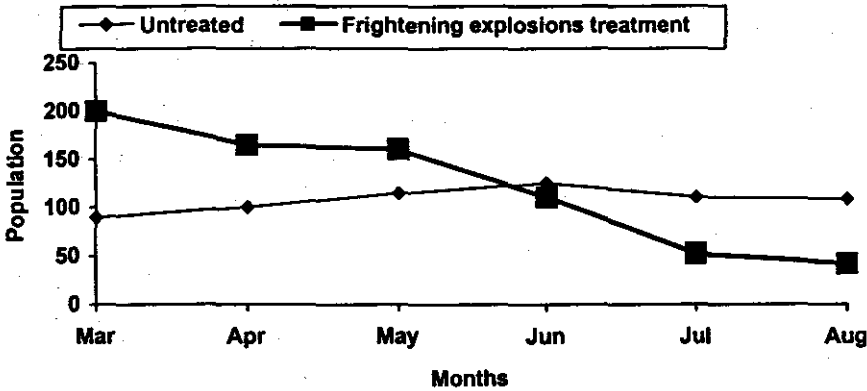


Fig. 1: Population dynamic of cattle egret, *Bubulcus ibis* under frightening explosions treatment in fruit orchard and untreated area (Kafr El-Sheikh, 2002).

1.2. On some biological aspects:

Data in Table (1) exhibit the influence of frightening explosions treatment, when applied monthly during the breeding season of cattle egret bird on its some biological aspects.

Table (1): Eco-biological observation of cattle egret, *Bubulcus ibis* under frightening explosions treatment and untreated area (Kafr El-Sheikh, 2002).

Biological aspects	Breeding season											
	Mar.		Apr.		May		Jun.		Jul.		Aug.	
	T	U	T	U	T	U	T	U	T	U	T	U
% nested trees	30	20	33.3	30	40	45	43.3	65	50	75	53.3	80
Total no. of nests	28	12	13	16	8	21	5	33	4	28	1	15
No. of empty nes's	16	6	8	2	5	4	4	5	4	8	1	6
No. of nests with eggs	9	6	4	6	2	7	1	13	0.0	8	0.0	6
No. of nests with eggs& nestlings	3	0	1	8	1	10	0.0	5	0.0	12	0.0	3

T = Frightening explosions treatment

U = Untreated area

The percentage of nested trees with cattle egrets noticeably affected with this treatment and the adverse effects were obvious with repeating it during the months of breeding season as 30% of the adjacent trees were nested in the treated area during March, the beginning of treatment and faintly increased with the progress of breeding season to be 53.3% with rate of 0.77 fold while in untreated area, the nested trees drastically increased from 20% during March to be 80% during August reaching 4 fold.

On the other hand, total number of nests in the treated area

drastically decreased from 28 nest during March to be only one nest in August while the contrary was observed in untreated area as their number moderately increased from 12 nests in the beginning of breeding season (March) to be 15 one during August recording th maximum (33 nests) during June which corresponded with 5 nests in treated area.

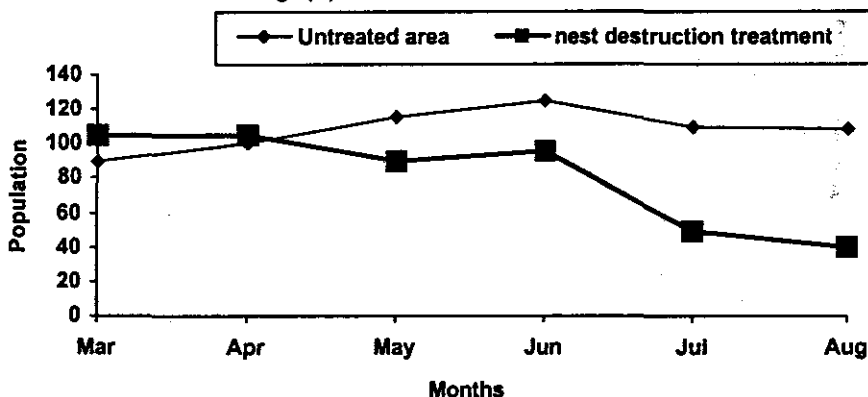
In the same time, number of nests occupied with eggs or eggs and nestlings were found throughout months of breeding season in the untreated area with averages of 6.0 & 0.0, 6.0 & 8.0, 7.0 & 10, 13.0 & 15.0, 8.0 & 12.0 and 6.0 & 3.0 nests when trees were investigated during March, April, May, June, July and August. Compared with 9.0 & 3.0, 4 & 1, 2 & 1, 1 & 0.0, 0.0 & 0.0 and 0.0 & 0.0. In the same months of breeding season in treated area.

In Hawaii, Fellow and Paton (1988), found that no nests were established during control period in response to freighting explosion and reduced the roosting egrets at the heronry site. They also added that this technique would probably have greatest potential in case of small roosts on bare ground.

## 2. Effect of nest destruction:

### 2.1. On population dynamics:

The effect of nest destruction of cattle egrets on its population dynamics are shown in Fig. (2).



**Fig. 2: Population dynamics of cattle egret, *Bubulcus ibis* under nest destruction treatment in poultry farm and untreated area (Kafr El-Sheikh, 2002).**

The illustrated data showed that numbers of birds in untreated area did not considerably differ during the breeding months as a 90 individual were recorded in March and reached the maximum in June (125) then gradually decreased to be 108 birds in August.

On the other hand, the contrast was observed in the treated area, as monthly nest destruction which run in casuarina trees adjacent to poultry farm adversely affect on numbers of birds as the recorded number of birds in March (105 individual) drastically decreased to be 40 ones with 61.9% decrease.

March and Howard (1994) reported that, systematic destruction of nests and eggs of house sparrow 10 to 12 days intervals will reduce reproduction and often move the birds from a location and prevent congregation during the breeding season.

Wilson (1999) mentioned that removal of nests and eggs of bird species breeding in and around cropped areas will force the birds to leave breeding ground and shift to another area. This method is particularly useful for birds like house sparrows.

## 2.2. On some biological aspects:

It is clear from the obtained data in Table (2) that nest destruction affected vigorously on percentage of total number of nests and those have eggs and nestlings.

Percentage of nested trees and total number of nests were 20% & 16 nests before treatment during March and with monthly repeating treatment, they were 15 & 14, 10 & 10, 10 & 8, 5 & 2 and 0.0 & 0.0 when nests destruction run in April, May, June, July and August consequently.

On the other side the two values of these aspects in untreated area gradually increased from 20% & 12 nests in March to be 80% & 15 nests in the end of breeding season.

Also, number of nests have eggs or eggs and nestlings adversely influenced with nest destruction treatment when compared with those in untreatment area as their values decreased from 4 and 2 nests in the beginning of breeding season (March) to be 0.0 & 0.0 at the end in the treated area with corresponding values of 6.0 & 0.0 and 6.0 & 3.0 nests, respectively.

Table (2): Eco-biological observation of cattle egret, *Bubulcus ibis* under nest destruction treatment and untreated area (Kafr El-Sheikh, 2002).

Biological aspects	Breeding season											
	Mar.		Apr.		May		Jun.		Jul.		Aug.	
	T	U	T	U	T	U	T	U	T	U	T	U
% nested trees	20	20	15	30	10	45	10	65	5	75	0.0	80
Total no. of nests	16	12	14	16	10	21	8	33	2	28	0.0	15
No. of empty nests	10	6	8	2	6	4	4	5	0.0	8	0.0	6
No. of nests with eggs	4	6	4	6	2	7	2	13	2	8	0.0	6
No. of nests with eggs & nestlings	2	0	2	8	2	10	2	15	0.0	12	0.0	3

T = Nest destruction treatment

U = Untreated area

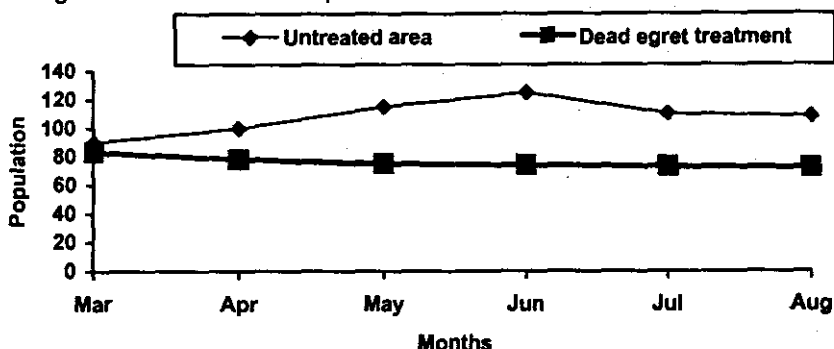
El-Deeb (1990) found that numbers of nested trees, total numbers of nests, total numbers of eggs and nestlings affected significantly by nests destroying during the breeding period. He also mentioned that, nest destruction seemed to be effective as a control method especially when it runs during the breeding season.

## 3. Effect of dead egret:

### 3.1. On population dynamics:

Using a few dead egrets placed in clear view around the roosts as a

method to control egrets in nursery was done to reduce the size of the congregation. In this area about 83 egrets were roosting on the trees surrounded the nursery. At onset of treatment, roosting birds often removed in response to visual cue but returned within hours. data in Fig. (3) show that the dead egret did little to reduce potential hazards.



**Fig. 3: Population dynamics of cattle egret, *Bubulcus ibis* under dead egret treatment in nursery and untreated area (Kafr El-Sheikh, 2002).**

The remained egrets after treatment declined gradually during the breeding season as it reached to 72 birds in August. The dead egrets treatment failed to prevent congregation during breeding season as the reduction percentage at this method was 13.25%. The adult population continued to use the original trees exclusively during this period and there was no detectable response when compared with those roosting at Sakha Experimental Station without treatment. Fellow and Paton, 1988 reported that egrets may abandon a new roost in response to a few dead egrets placed in clear view around the roosts.

### 3.2. On some biological aspects:

The same eco-biological observations on nesting under the treatment of dead egrets were noticed in trees adjacent to the nursery as shown in Table (3).

**Table (3): Eco-biological observation of cattle egret, *Bubulcus ibis* under dead egret treatment and untreated area (Kafr El-Sheikh, 2002).**

Biological aspects	Breeding season											
	Mar.		Apr.		May		Jun.		Jul.		Aug.	
	T	U	T	U	T	U	T	U	T	U	T	U
% nested trees	16.6	20	33.3	30	44.4	45	55.5	65	66.6	75	66.6	80
Total no. of nests	20	12	16	16	12	21	10	33	8	28	4	15
No. of empty nests	6	6	6	2	4	4	2	5	2	8	2	6
No. of nests with eggs	6	6	2	6	6	7	4	13	4	8	2	6
No. of nests with eggs& nestlings	8	0	8	8	2	10	4	15	2	12	0.0	3

T= Dead egret treatment

U= Untreated area

In treated area, the percentage of nested trees increased gradually from 16.6% during March to be 66.6% during August, with rate of 3.01 fold while in untreated area, the percentage of nested trees drastically increased from 20% during March to 80% during August reaching 4 fold.

On the other hand, total number of nests in the treated area drastically decreased from 20 nests during March to be 4 nests in August while the contrary was observed in untreated area as their number moderately increased from 12 nests in the beginning of breeding season (March) to be 15 ones during August, recording the maximum (33 nests) during June which corresponded with 10 nests in treated area.

Also, number of nests have eggs or eggs and nestling adversely influenced with dead egret treatment when compared with those in untreatment area as their values decreased from 6 and 8 nests in the beginning of breeding season (March) to be 2 & 0.0 at the end in the treated area with corresponding values of 6.0 & 0.0 and 6.0 & 3.0 nests, respectively.

Paton *et al.* 1986 reported that dead egrets technique move roosts and heronries to more remote location and discourage congregation and nesting.

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### استجابة ابو قردان لطرق تنظيم أعداد الطيور بمحافظة كفر الشيخ

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أجريت هذه الدراسة تحت الظروف البيئية لمحافظة كفر الشيخ لتطبيق برنامج تنظيم أعداد ابو قردان والحد من ضررها في اماكن تعشيشها وقد اظهرت النتائج المتحصل عليها: أن استخدام المفرقات كان له التأثير القوى والفعال في طرد طيور ابو قردان من اماكن تعشيشها على اشجار البرتقال حيث وصلت نسب الطرد الى ٧٩% ، بينما كان هدم العشوش وازالتها اقل تأثيرا في تشتيت الطيور وطردها من مواقعها للكامنة في مزرعة لانتاج الدواجن بكلية الزراعة بكفر الشيخ حيث وصلت نسبة الطرد الى ٦١,٩%. على عكس ذلك نجد ان استخدام الطيور الميتة وتعليقها حول اماكن تعشيش الطيور كوسيلة للمكافحة كان لها تأثير ضعيف على طرد الطيور حيث وصلت نسبة الطرد الى ١٣,٢٥% وذلك بالمقارنة بالمنطقة الغير معاملة حيث وصلت نسبة الزيادة في تعداد الطائر إلى ٢٠%. ومن ناحية اخرى فإن تأثير مكافحة ابو قردان على النواحي الايكولوجية قد تم ايضا دراستها. ولظهرت للنتائج المتحصل عليها أن:

نسبة للتعشيش عند استخدام المفرقات بلغت ٥٣,٣% ، بينما كانت طريقة هدم العشوش وكذلك استخدام الطيور الميتة اقل تأثيرا فزادت نسبة للتعشيش الى ٦٠% ، ٦٦,٦% على التوالي مقارنة بالمنطقة الغير معاملة حيث وصلت نسبة للتعشيش الى ٨٠%. ومن ناحية اخرى فان عدد العشوش التي تحتوى على بيض فقط وكذلك التي تحتوى على بيض وصغار تأثرت ايضا بطرق المكافحة المختلفة فكانت اكثر تأثرا في التعداد عند استخدام المفرقات يليها هدم العشوش بينما كانت طريقة الطيور الميتة اقل تأثيرا.