



Designation: E 551 – 95

Standard Test Methods for Developing Effective Bird Control Chemicals¹

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INTRODUCTION

Bird control is both an art and a science. The successful application of bird control chemicals requires skilled individuals with extensive training and field experience. However, even the most skilled applicator cannot obtain satisfactory results with a chemical that was poorly developed or is without the innate potential for effective control. Committee E35.17 recognizes that initial laboratory and field tests for bird control chemicals must be standardized and improved while gathering sufficient information to provide reasonable safeguards for many environmental concerns.

1. Scope

1.1 These methods provide a general list of standardized test methods that may be necessary to develop safe and effective bird control chemicals. Because of the variety of wild bird species involved in bird problems and their different food habits and behavior, it is impossible to make these methods completely detailed. However, these methods should provide an adequate data base to evaluate efficacy and certain associated hazards to allow eventual registration and use of a bird control chemical and associated techniques, if effective.

1.2 Research in this field in the United States is primarily associated with government funding, because of low economic incentives and intensive regulation. Such factors periodically change without reference to science.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see paragraph 4.2.4.

2. Referenced Documents

2.1 ASTM Standards:

E 555 Practice for Determining Acute Oral LD50 for Testing Vertebrate Control Agents²

E 657 Test Method for Comparative Acute and Long-Term Oral or Gustatory Avian Repellency²

3. Test Specimens

3.1 *Handling Procedures*—Efforts must be taken to estab-

lish routine handling and testing procedures for birds. Undue stress must be avoided, since stress alone can cause mortality, particularly in wild-captured specimens.

3.2 *Test Birds*—All target species must be tested.

3.3 *Selection of Test Birds:*

3.3.1 Test birds may be laboratory reared or wild-captured.

3.3.2 Test birds should be adults or subadults (but not normally juveniles), and should not include aged, emaciated, visibly injured, or otherwise abnormal specimens. The general condition should be validated by a competent individual.

3.3.3 Behavioral, physiological, and psychological differences may require the separation of test results by sex or age or both.

3.4 *Pretest Conditioning:*

3.4.1 Maintain wild-captured birds in captivity for at least 14 days to allow them to become acclimated to captive conditions.

3.4.2 Maintain laboratory-reared or previously acclimated wild-captured birds for 7 days in the type of pen or cage that is to be used for the test, or in the actual test cage.

3.4.3 Diet and general condition of test birds should be stable for 7 days prior to testing.

3.4.4 Provide a cage or pen, the type, size, and configuration of which should be sufficient to allow freedom of movement so as to minimize stress to the test birds.

3.5 *Number of Birds Required for Testing:*

3.5.1 The number of test birds required will vary according to the test, statistical method, and availability. However, a minimum of 20 adult or subadult males and 20 females should normally be used for each species, with a minimum of 5 males and 5 females per treatment level. Juveniles may be required in some tests, but should not replace adults or subadults unless specified.

3.5.2 Many wild birds are protected by international treaty and the number of these birds available for testing may be limited; therefore, preliminary tests may be performed using

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² *Annual Book of ASTM Standards*, Vol 11.05.

one or more of five readily available or nonprotected wild or domesticated avian species, including bobwhite (*Colinus virginianus*), common pigeon (*Columba livia*), coturnix (*Coturnix coturnix*), house sparrow (*Passer domesticus*), or starling (*Sturnus vulgaris*).

3.5.3 Final laboratory tests must always be made on all target species; with protected species of limited availability, tests may be conducted using a minimum of six males and six females, two of each sex per treatment level.

3.6 Use of Control Birds or Groups:

3.6.1 One treatment level in each test should be designated as a control, and be handled exactly as treated birds, except that the test chemical will not be administered.

3.6.2 This requirement may be waived if the availability of birds for the test is so limited that a sufficient number of treatment levels cannot be run if controls are used. If this requirement is waived because of a lack of available specimens, supplemental field observations should be performed by competent persons, as a minimal requirement.

3.7 Observations:

3.7.1 Periodic observations should be made on all parameters likely to be affected by the test, but should always include mortality or intoxication signs, weight change, food consumption, recovery period, and induced behavioral abnormalities.

3.7.2 Observe and record any behavioral changes that might serve as vocal or postural communication to other individuals of target or nontarget species. Such changes could affect the efficacy of a chemical when it is used under field conditions.

3.8 *Pathological Examination*—Examine all birds for gross pathological changes. Examination of two to four randomly selected birds from each treatment for histological changes is also desirable.

3.9 *Analysis of Data*—Data from all species should be presented with accompanying narrative. Statistical treatment alone may convey misleading conclusions.

4. Procedure

4.1 Toxicity—Target Species:

4.1.1 *Acute Oral*—The acute oral avian LD50 should be established for all technical and formulated bird control chemicals regardless of intended use, following the basic procedures outlined in Practice E 555. Specific examples of the application of LD50 test methodologies to birds can be found in the literature (see references).

4.1.2 Acute Dermal:

4.1.2.1 The acute dermal LD50 should be established for all technical and formulated chemicals that are proposed for use in intimate contact with the skin (dermal toxicants, repellents, etc.), even if only as an adjunct.

4.1.2.2 The test method in birds for chemicals acting on the skin is to apply known amounts of the candidate material to the unfeathered skin area on the breast, adjacent to the proximal humoral wing joint, using a blunted applicator and nontoxic, volatile carrier.

4.1.2.3 A similar test should be conducted on the feet for materials intended for use by means of foot contact.

4.1.3 Inhalation:

4.1.3.1 Technical grade and formulated chemicals that are intended to act as fumigants or to be used as an aerosol spray

should be tested for toxicity by inhalation.

4.1.3.2 If the anticipated exposure is short (less than 5 min), tests should be conducted in a sealed or gas-tight test chamber of known air volume in which the test birds can live for 10 min without oxygen depletion. Introduce a quantity of the intended fumigant or aerosol spray that will produce a given treatment level, into the chamber and hold for 10 min. At the end of the 10-min period, introduce fresh air and evacuate the fumigant-laden air.

4.1.3.3 If the anticipated exposure period is greater than 5 min, than a larger static test chamber, or a flow-through chamber in which a given exposure level of fumigant of aerosol spray can be maintained for 30 to 60 min, should be used.

4.1.3.4 Through repetitive tests on target species, an LC50 can be obtained either in separate or group tests.

4.1.4 Subacute Toxicity:

4.1.4.1 When there is a probability that individual birds will be exposed to a formulated bird control chemical for more than 48 h, it is necessary to determine the subacute toxicity of the chemical.

4.1.4.2 Administer known acutely sublethal doses of the chemical in feed or by gavage to 4 to 8 groups of 10 adult or subadult test birds (five male and five female) daily for at least 14 but not more than 30 days. Choose dose levels that can be expected to produce 100 % mortality, partial mortality, and no mortality. Birds should be sacrificed immediately upon removal of treatment and examined for gross pathological changes.

4.1.5 Acceptance Tests:

4.1.5.1 If a control chemical is to be used on a bait that requires ingestion for efficacy, a test of the acceptance of treated baits is necessary.

4.1.5.2 A standard ration for testing acceptance in birds does not exist. Because of the wide variation in natural food habits and the wide disparity between naturally occurring foods and laboratory or commercially prepared food rations, habituation is more important to avian food habits than is relative availability. Therefore, acceptance should be tested using whatever standard ration the caged birds are accustomed to eating, thus, in each test, the ration to which the birds have been habituated will serve as a control ration.

4.1.5.3 Acceptance tests should be made on a minimum of five adult males, five adult females, and five subadults of either sex of the target species, individually caged. Initial tests should be free choice between a control ration and the food carrier that will be treated, both offered for a minimum of three days in sufficient amount to satisfy each animal's daily feed requirement. Following the initial test, a similar evaluation using the chemically treated bait and control ration will be conducted. There should be no fasting of subject animals and the tests should be made during regular feeding hours.

4.1.5.4 Acceptance studies should be completed prior to any field testing and are required for all candidate carrier formulations. All changes in formulations for field use should be tested for acceptability.

4.1.5.5 Acceptance of treated rations should be sufficient to