Food Crops for GAME BIRDS on FARM LANDS

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SUMMARY

(1) Much of the food needed by game birds in Alabama can be provided by diversified farming, especially the harvesting of crops by hogs and other livestock. The principal need for special wildlife plantings on farm lands is to alleviate the food shortage that is usually most severe during March and April.

(2) Game bird food plantings are compatable with good farm management, and for the most part they should be located along field borders and fence rows.

(3) Wildlife plantings should be included in long-time farm management plans and should not be treated merely on a temporary basis.

(4) The most useful plants now recommended for long-time wildlife plantings under Alabama conditions are: bicolor lespedeza; large, or showy, partridge pea; and common lespedeza. These crops can be maintained from year to year at very little expense.

(5) Plantings of benne, cowpeas, sorghums, millets, peanuts, and certain other annuals can produce much bird food for a temporary period. However, the cost is usually prohibitive, unless they are grown primarily for general farming purposes.

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FOOD CROPS for GAME BIRDS on FARM LANDS[1]

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MOST WILD UPLAND game birds in the Southeastern part of the United States are found on farm lands. Thus, farmers and landowners are in a better position to provide food and to improve conditions for wildlife than any other group in this region.

Improved conditions for wildlife usually yield good returns to farmers and landowners in various ways. Birds aid in the control of insects and weeds. For instance, a mourning dove sometimes consumes 20,000 or more seed in a day. On well-managed farms, some financial return from hunting rights can be obtained. To a surprisingly large number of landowners, bobwhite and other game birds are desired for no other reason than to have such wildlife present on their lands.

The provision of game bird food crops goes hand in hand with good farming. Plantings of such crops improve the soil, prevent erosion, and serve other useful purposes. While waste seed from such commonly grown farm crops as cowpeas, soybeans, peanuts, and common lespedeza are used frequently by game birds, it is necessary that food be available in some form throughout the year, if a maximum population of birds is to be maintained on a farm. A food shortage usually prevails during March and April.

This report is concerned with the production of food crops for game birds under conditions existing on Alabama farm lands. For the most part, the information presented is based on results from many experimental plantings made by the Alabama Agricultural

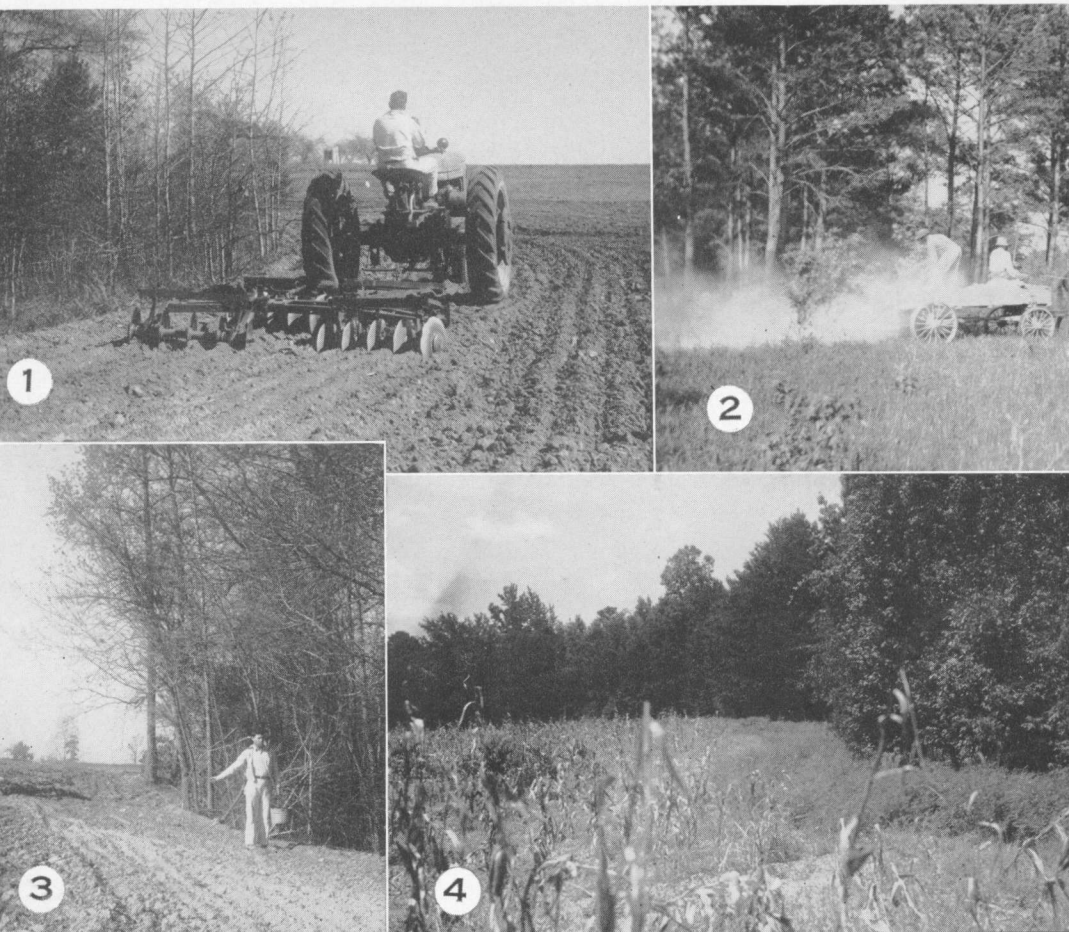
[1]A contribution from Alabama Cooperative Wildlife Research Unit, which is supported jointly by the Alabama Polytechnic Institute, Alabama Department of Conservation, American Wildlife Institute, and the Fish and Wildlife Service of the United States Department of the Interior.

Experiment Station during the 7-year period of 1937-43. In addition, records and observations have been secured from a number of cooperating individuals and agencies, and from the literature.

WHERE TO PLANT

Plantings of food crops for upland game birds should be located in situations where the birds normally prefer to feed. Mourning doves will readily visit wide open fields in search of food, but quail prefer to feed near the protection afforded by shrubs, vines, thickets, hedgerows, and woods. They seldom use food located more than 200 yards from such cover. Long narrow strips, 6 to 30 feet in width, at the margins of woodland or along fence rows are highly recommended. Many small areas, ¼ acre or less in size and well distributed over the farm, are more useful than one or two

The establishment of a wildlife border involves thorough seedbed preparation (1), application of sufficient amounts of fertilizer (2), and seeding (3). The finished border (4) provides food near adequate cover.



large areas. Little or no success may be expected from efforts to produce bird foods on large, improved, regularly grazed pastures. Any locations selected for planting game bird food crops should be part of a long-time farm management program, and such locations should be managed as rather permanent wildlife areas. The establishment of temporary annual plantings is not recommended generally, because of the cost as compared with that of more permanent developments. Some wildlife food crops will grow well only under certain conditions of moisture, soil, or climate. Such limiting factors must be considered when selecting locations for plantings.

WHEN TO PLANT

Some food crop for farm game birds may be planted during almost every month of the year. Summer crops are planted during the spring and summer, while winter crops are seeded during the fall and early winter months. Planting dates for the more important species are given in Chart 1 (page 19). Plantings should be made at the best time to permit maximum seed production.

HOW TO PLANT

In general, wildlife foods are planted just as other farm crops, with no special equipment being needed. Since the object is to grow plants for seed and not for rank vegetation, the rate of seeding usually can be reduced, as compared with plantings for hay or forage. The seedbed should be well prepared, firm, and free of weeds. Broadcasting or drilling is the best method of planting. A cultipacker is the most satisfactory tool for covering seed after broadcasting. The seed should be planted at a depth of not greater than ½ inch. Inoculation of the seed may be necessary to obtain best results from sesbania and winter legumes.

USE OF FERTILIZER

Some bird food crops can be grown satisfactorily without artificial fertilization, but, on many Alabama farm lands, the success of plantings depends much upon fertilization. Plants need nourishment for the production of seed for game as much as they do when

grown as cultivated crops for other uses. Legumes should receive 200 pounds or more of 18 per cent superphosphate or 400 pounds of basic slag per acre. Where needed, potash is applied at the rate of 50 pounds of muriate per acre. An application of 300 pounds per acre of a 0-14-10 fertilizer may be used in place of the phosphate and potash. Nonlegumes usually grow best when fertilized with 200 pounds or more per acre of a complete fertilizer (6-8-4). Winter grains should be top-dressed about March 1 with 100 pounds of sodium nitrate, or 75 pounds of ammonium sulphate, or 50 pounds of ammonium nitrate. Recommendations for local conditions should be obtained from the County Agent, or the Vocational Agriculture Teacher.

WILDLIFE PESTS

It is much more practical to avoid damage from wildlife pests by using preventive measures than to control them after damage is in progress. Damage to wildlife plantings in Alabama is most frequently caused by rabbits, English sparrows, and cotton rats. Detailed instructions for the control of certain animal pests can be obtained from the United States Department of the Interior Wildlife Leaflet 236.[2]

Cotton rat

Rabbits may be controlled by trapping or shooting; damage to plants may be prevented by use of repellent preparations. English sparrows usually are most numerous near farm buildings and are especially attracted to sorghums. Cotton rats commonly occur in large numbers on farms that afford suitable cover, such as honeysuckle vines, dense stands of broomsedge, or rank growths of grass and weeds. These shy, out-of-door pests usually feed during daylight hours; they should not be confused with the rats and mice

[2] Copies may be obtained from the Fish and Wildlife Service, United States Department of the Interior, Chicago 54, Ill.

commonly found in farm buildings. Because of their secretive nature, cotton rats frequently go unnoticed by the layman, but they often become serious competitors for seeds intended for desirable species of wildlife. One cotton rat may consume three or four times as many seed as a quail in one day. In addition, cotton rats cause much damage by rifling quail nests. Destruction of their preferred habitat is the best control; this may be done by controlled burning, disking, or plowing.

WHAT TO PLANT

Game bird food plantings should provide food when and where it is most needed (Chart 2, page 20). In choosing proper species for planting, an evaluation of local conditions must first be made, giving consideration to the foods already available from cultivated crops or wild plants. In general, summer crops are more important than winter crops. When further information is available, the role of winter crops may become more important. At present the principal value may be as winter greenstuff.

Summer Legumes

BEGGARWEED, FLORIDA. The seed of the Florida beggarweed are important quail food in the Coastal Plain of the Southeastern States, and it is also consumed by other wildlife species. The seed drop to the ground during the fall and winter months, and they are available until late in the spring.

A rather long growing season is required, and plantings in northern Alabama may be damaged by frost. For this reason, plantings should be confined to the southern half of the State. Scarified seed are commercially available. Satisfactory growth may be obtained on poor soils under light shade, but best growth occurs on fertile, moist, sandy soils. Natural reseeding occurs frequently in many southern Alabama cornfields; beggarweed is recommended primarily for use under such conditions. It is sometimes grown for forage and soil improvement. Since rabbits relish the young plants, they may entirely destroy small plantings.

COWPEAS. Most birds readily consume cowpeas, and, under present farming practices, they make up an important part of the food eaten by quail and dove in Alabama. The seed usually deteriorate rapidly when left exposed to the weather, which greatly reduces their value to wildlife. This problem can be overcome to some extent by planting such rather durable varieties as Brabham or Iron. Plantings at high altitude, such as on Sand Mountain in northern Alabama, produce seed that remain in edible condition for a much longer period than those exposed to the weather conditions prevailing in the southern part of the State. Since cowpeas must be considered strictly as an annual, this species should be used primarily as a general farm crop with incidental wildlife value. Only wilt-resistant varieties (Brabham and Iron) should be planted on soils where wilt disease is present. Rabbits may damage small plantings.

LESPEDEZAS, ANNUAL. The most important winter food of quail in Alabama is the seed of annual lespedezas. While not preferred by the mourning dove, these seed play an important role in the dove's diet late in the winter after the more palatable foods have become depleted. Wild turkeys, white-tailed deer, and other wildlife species also obtain food from these plants. The seed ripen early in the fall, and remain available in sufficient quantity until mid-March. Some sprouting occurs throughout the winter, and the small seedlings are consumed by quail as winter greenstuff. Sprouting increases progressively as spring advances and after mid-March very few live seed remain unsprouted. Annual lespedezas are grown extensively for pasture, hay, soil improvement, and erosion control.

Only two species of annual lespedeza are generally grown in Alabama. Common lespedeza *(Lespedeza striata)* is also known as Japan clover; it is the most important species, because it occurs

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Bicolor lespedeza is recommended for wildlife borders; it is a heavy producer of seed (1); it can be propagated from unhulled or hulled seed (2); it is girdled by rabbits (3), which causes the plant to produce many new stems (4); it conserves soil and water by producing a heavy mulch (5); and provides food and cover during summer (6) and winter (7).


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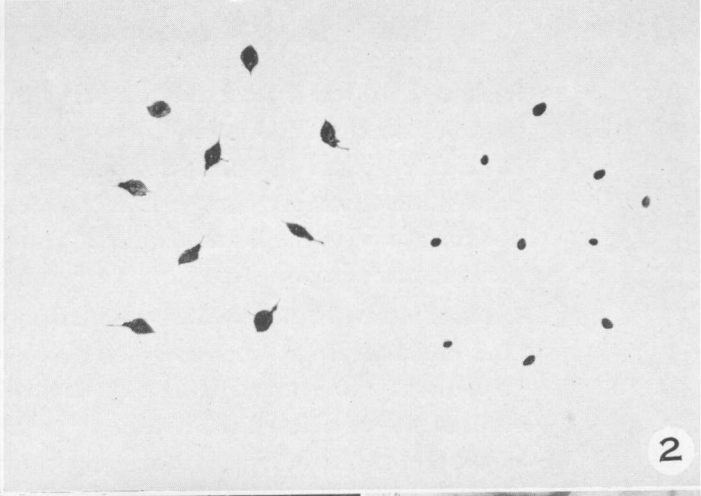
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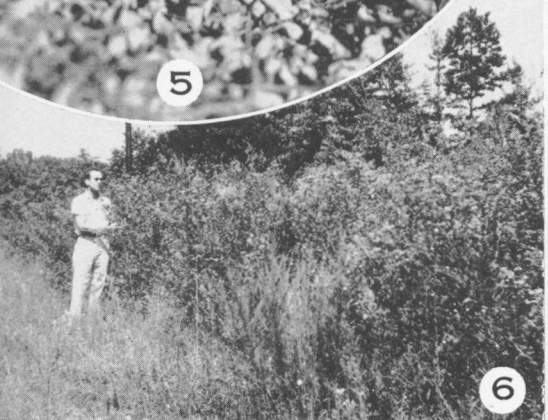
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both as a wild and domesticated plant throughout the State. Improved varieties of common lespedeza are Kobe and Tennessee 76. Korean lespedeza *(Lespedeza stipulacea)* ripens much earlier than the common variety, and it is recommended for use only in the northern part of the State. Annual lespedezas should have an important place in any farm game program in Alabama.

LESPEDEZAS, PERENNIAL. Perennial lespedezas have many desirable characteristics, and they should be considered in plans for permanent game management on farm lands. Information concerning the game bird food value of perennial lespedezas is rather incomplete, but adequate data are available for certain species. The seed of native, wild perennials are taken consistently but in small quantities by quail. Of the domesticated species, the most commonly grown is sericea lespedeza, which appears to be very low in palatability as a quail and dove food, and it is not recommended for this purpose. By contrast bicolor lespedeza produces seed that are sought after and taken in large quantities by both bobwhites and mourning doves. At present bicolor lespedeza is the only perennial species definitely recommended for production as quail food in Alabama. The seed usually remain in good condition on the ground for a year or more, and they provide palatable quail and dove food the year around. Bicolor may be propagated from seed or it may be transplanted from a nursery. It will grow on a variety of soils, but is not adapted for use on wet, low land or on extremely eroded sites. Bicolor is well suited for seeding field borders and fence rows where it produces cover useful to quail and other desirable wildlife species. Rabbits may girdle the stems during the winter, but this causes no serious injury and induces growth of additional stems, which is desirable.

MUNG BEAN. The mung bean is similar in many respects to cowpeas and soybeans. It may be grown successfully in all parts of Alabama, and usually it produces a satisfactory seed crop. Most of the seed shatter soon after ripening. This species apparently is suited only for annual plantings, and it may be substituted for cowpeas or soybeans with comparable results.

PARTRIDGE PEAS. Quail eat large quantities of partridge peas,

and in the Black Belt they consume more partridge peas than any other food item during January and February. Consumption probably would be equally as great in other parts of the State, if these peas were available in sufficient quantity. The seed shatter soon after ripening in September and October, and they remain in sound condition until mid-March, at which time most of the seed sprout. However, some are hard and remain available as bird food for an indefinite period.

There are a number of species of partridge peas in the Southeast, but the two most commonly found in Alabama are the large, or showy, partridge pea *(Chamaecrista fasciculata)* and small, or sensitive, partridge pea *(C. nictitans)*. Both species have been tested; the large, or showy, species has given excellent results for a number of years. The small, or sensitive, species is unsuited for domestic use, because of susceptibility to a wilt that kills the entire plant. While the large partridge pea naturally occurs most abundantly in the Black Belt, it is also found near streams and on moist soils throughout the State. It grows best on moist land, but it may be propagated successfully on nearly all upland farm sites. When once established excellent volunteer stands may be expected for a number of years without further care. Disking during the winter months stimulates volunteer growth; however, deep plowing may cause loss of the seed. This pea is excellent for improvement of the soil, and it is well suited for field borders and fence rows, and cultivated fields. Winter grains can be grown successfully in rotation with large partridge pea. In some sections it is valuable for nectar in honey production, the nectar being produced not by flowers but by a special nectary gland on the petiole of each leaf.

While partridge pea seed at present are not available commercially, they may be obtained from wild stands late in September or early in October. Harvesting may be done with a mowing machine or a combine. To avoid seed loss from shattering, the plants immediately after mowing are placed on a tarpaulin or tight floor. Newly harvested seed are then spread out to dry, and they are later stored in rat-proof containers. Neither scarification nor inoculation before planting is necessary.


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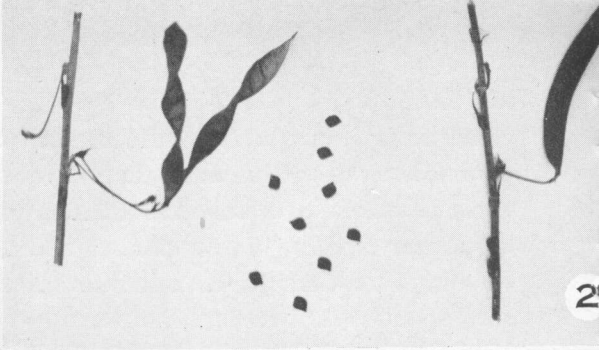
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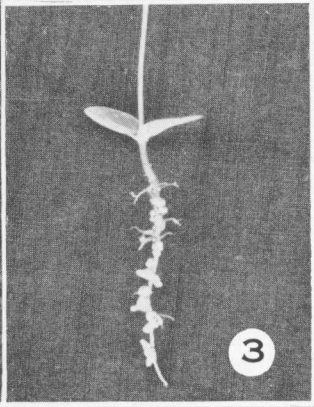
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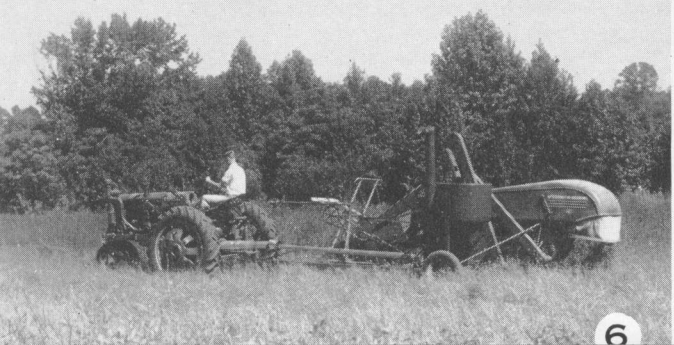
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PIGEON PEAS. There are many varieties of pigeon peas *(Cajanus indicus)* that may be grown in Alabama. Although very little information is available concerning the palatability of these seed to game birds, it is probable that pigeon peas would compare favorably with such well-known foods as cowpeas and soybeans. Pigeon peas were found to be unsatisfactory for use in wildlife plantings, because the seed do not shatter to the ground, and, hence, are not available to game birds. On all plantings observed the pods remained on the plants for many months and until the seed deteriorated, and were unsuitable for bird feed. Since pigeon peas must be cultivated annually, and, since they have no qualities that make make them especially desirable for wildlife plantings, it is recommended that other crops be selected for use in game management plantings.

SESBANIA. Sesbania *(Sesbania macrocarpa),* a native wild legume, produces an abundance of seed, which, although low in palatablity, are taken to some extent by quail and dove. It is important because the seed remain available late in the winter and spring, when a food shortage most often exists.

Sesbania seed are commercially available, and the plant responds readily to cultivation. While it may be grown throughout the State, a long-growing season is required and the seed should be planted early in the spring. Early frosts during the fall may destroy the seed crop in northern Alabama. However, volunteer stands have been known to exist for many years on suitable sites in the Tennessee Valley. Best growth and satisfactory volunteer stands may be expected on wet, heavy soils, which are evidently the natural habitat of sesbania. Dry upland soils are not suitable for the production of this plant. Seed should be inoculated when planted on areas where sesbania has not been grown recently.

SOYBEANS. There are many varieties of soybeans grown in Ala-

◀ Large partridge pea is abundant in the Black Belt, but may be grown throughout the State, even on poor soils (1); its seed shatter soon after ripening (2); it produces nitrogen nodules (3) which improve the soil; it produces many seed (4), which can be harvested by mowing and stacking (5) or by combining (6); its seed (7) are in commercial demand.

bama. The shattered or waste seed serve frequently as a staple food for game birds on the farm. Both quail and dove readily consume soybeans whenever available, which is only during a few months of the year. In many respects soybeans may be compared with cowpeas. In general, cowpeas ripen earlier, but soybeans remain available later. Since this crop must be planted annually and cultivated for maximum seed production, it is recommended only for general farming purposes and not for planting on permanent wildlife borders or special areas. Preferred varieties are Laredo and Tanner. Rabbits frequently consume the young plants when grown near suitable cover.

Summer Nonlegumes

BENNE. The seed of benne *(Sesame orientale)* are known to be palatable to both quail and dove. These seed are relatively soft, and do not remain in edible condition for a long period after exposure on the ground. The seed pods usually begin to ripen late in August, and the seed are gradually wind-threshed from the pods over a period of several months. Food is available in greatest quantities during the months of September, October, and November. This plant must be considered strictly as an annual. Best results are obtained when planted on fairly fertile soil and given cultivation. Plantings are made preferably during May. Earlier plantings usually give poor stands, and late plantings give relatively small growth. While benne can be grown satisfactorily throughout Alabama, it is useful primarily as an annual food planting, and it is not recommended for use in permanent wildlife developments. It is sometimes planted near farm yards for the production of feed for poultry.

MILLETS. Useful bird feed may be produced by a number of millets throughout Alabama. Various millets are frequently

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Other bird food crops are: sesbania (1), which grows best on heavy moist soils; sorghums (2), which provide food for only a short period; benne, which must be cultivated in summer (3) and which produces seed (4) that are available in the fall; common lespedeza (5), which is one of the most important quail food crops; and German millet (6) and browntop millet (7), which are suitable only for annual plantings.


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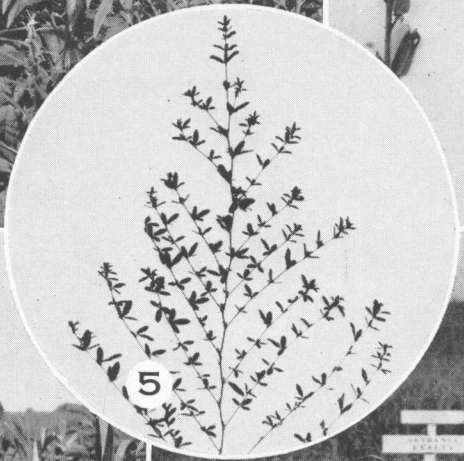
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GERMAN MILLET
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BROWNTOP
MILLET
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grown for hay or other purposes; game birds often obtain many seed from such plantings. Proso millet ripens earlier than other kinds, but it usually makes relatively small growth and it is not generally successful, except in the southern third of Alabama. Browntop and German millets are the two kinds most commonly grown; both are adaptable to a wide range of soil conditions and planting dates. Although the seed of browntop millet ripen 1 to 2 weeks earlier than German millet, seed of German millet remain available in sound condition over a longer period of time than any of the other millets observed. Japanese millet, Texas millet, and pearl, or cat-tail, millet were found to be much less useful for wildlife purposes than the proso, browntop, or German millets.

SORGHUMS. There are many varieties of sorghum that may be grown successfully throughout Alabama. Apparently all of the sorghums provide seed that are acceptable to quail and dove. The seed are soft, nondurable, and usually do not remain available late in the winter. However, the seed remain sound for a longer time at high altitudes, such as on Sand Mountain, than at lower elevations. Sorghums are commonly grown for various agricultural purposes, and as such considerable feed is often provided for game birds. It is not recommended that plantings be made specifically for consumption by wildlife, since this crop must be grown as an annual on relatively fertile soil, and since it cannot be justified when compared with other crops that are more suitable for use in a long-time wildlife program. The sorghum midge, an insect pest, may cause failure of the seed crop. Apparently the best means of reducing damage from this pest is by selection of the proper planting date. Late plantings are usually subject to little midge damage.

SUDAN GRASS. Sudan grass produces seed that are of little value as food for game birds. It is probably more suitable for use by dove than by quail. Sudan grass is readily propagated as a hay crop, and it is sometimes used for erosion control purposes. Because of its low palatability and lack of specific desirable qualities, this grass is not recommended for use in a permanent wildlife management program on farm lands in Alabama.

Summer Mixtures

A number of combinations of summer crops have been tested, and frequently only one species in each mixture was successful. The most aggressive species usually provides serious competition for all others. It would be more practical to make separate plantings of the more desirable species, especially in permanent plantings. No summer mixtures are recommended, although some may be fairly satisfactory for temporary annual food patches.

Winter Legumes

AUSTRIAN WINTER PEAS. The seed of Austrian winter peas are not usually available in sufficient quantity to be of importance to game birds, but some value may be obtained as winter green feed.

CALEY, OR WILD WINTER, PEAS. Caley peas *(Lathyrus hirsutus)* usually produce a heavy seed crop, which may be suitable for game birds, but specific evidence is lacking. The seed ripen and shatter late in the spring, and they usually remain in sound condition throughout the summer. Some are hard and remain sound indefinitely. Excellent volunteer stands have been reported from the Black Belt. A satisfactory seed crop can be expected from plantings throughout Alabama, even under conditions that produce only small plants having little or no forage value. Poisoning may result if livestock are allowed to graze the immature pods. The Caley pea is one of the most useful winter crops that may be planted for game bird management purposes. It does not ripen seed as early as some of the vetches.

VETCHES. Many kinds of vetches can be grown in Alabama, and, insofar as is known, the seed of all species are suitable for bird feed. To be of most benefit, the seed should become available early in the spring before other seed ripen in quantity. Augusta or Native vetch *(Vicia angustifolia)* and Grandifolia vetch *(Vicia grandifolia)* ripen earlier than any other known varieties; these should be given preference. The quantity of vetch seed produced from year to year may vary greatly with weather conditions.

Winter Nonlegumes

ITALIAN RYE GRASS. This grass is generally grown as a winter lawn grass and to some extent for grazing and prevention of soil erosion. It appears to be of little or no value to wildlife.

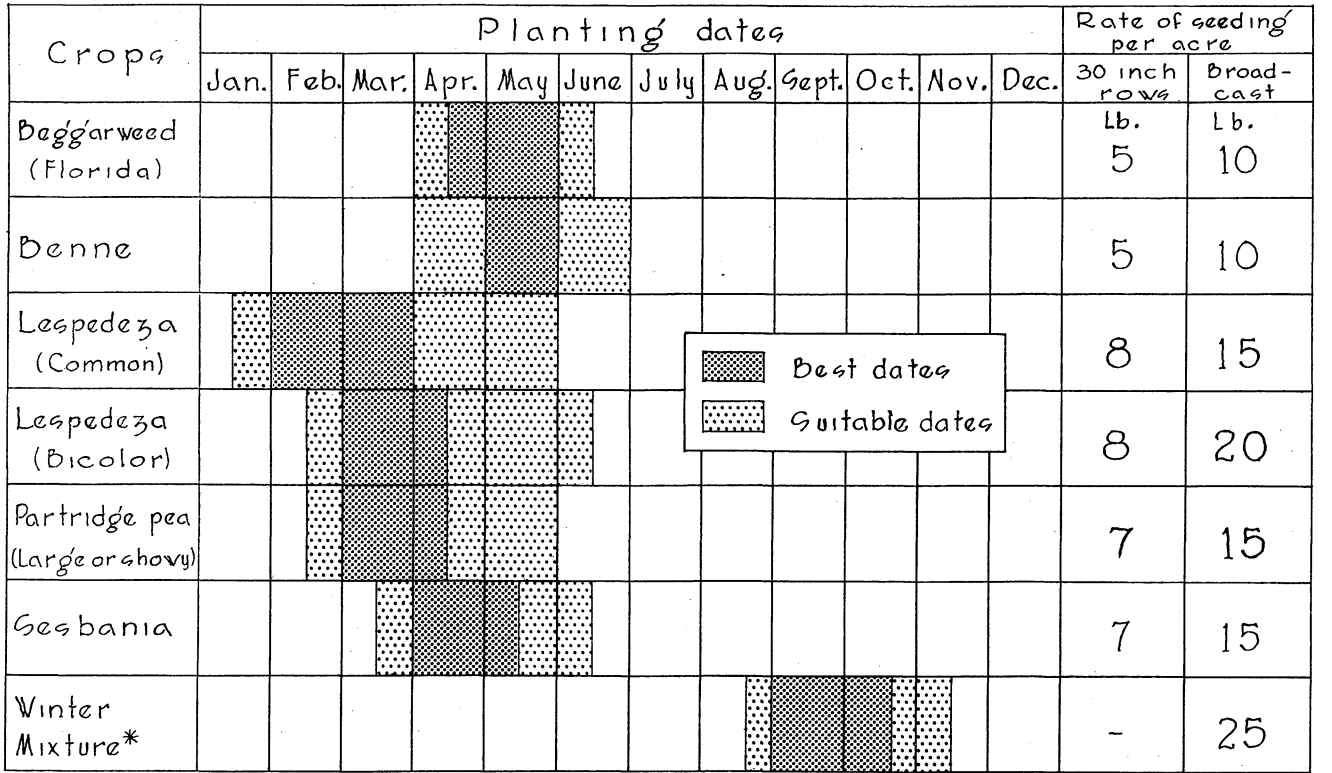
SMALL GRAINS. Many kinds of small grains have been observed for their value to wildlife. Wheat provides more desirable food than other small grains commonly grown in Alabama. While all small grains are of some value as winter green feed, the seed crops other than wheat are not greatly used by game birds. As a rule small grains should be considered only for general agricultural purposes and not specifically for wildlife plantings.

Winter Mixtures

If winter crops are to be grown specifically for wildlife purposes, it may be most practical to use a mixture to provide a variety of seed or to ensure the success of at least one or more species in the planting. Frequently, certain constituents of a mixture are successful to the detriment of the others. Usually, however, one or more kinds give satisfactory results. A number of mixtures have been tested and none has been found superior to the formula recommended by Herbert L. Stoddard of the Cooperative Quail Study Association, Thomasville, Georgia. This mixture is as follows: Augusta vetch 60 pounds, Caley or wild winter peas 30 pounds, rye 7 pounds, oats 7 pounds, and wheat 7 pounds. The mixture must be planted as an annual. However, the Augusta vetch and Caley peas may give satisfactory volunteer stands for one or more years under suitable conditions.

ACKNOWLEDGMENT. Plot work for testing game bird food crops for Alabama was carried on at the Black Belt Substation, Marion Junction; Gulf Coast Substation, Fairhope; Sand Mountain Substation, Crossville; Tennessee Valley Substation, Belle Mina; Wiregrass Substation, Headland; and Main Station, Auburn; cover page photo by O. Earle Frye, Jr., a former graduate student in wildlife research, Alabama Polytechnic Institute.

Chart 1. Dates and Rates of Plantings for Game Bird Food Crops in Alabama



*Stoddard formula (by weight) Augusta vetch 60, Caley pea 30, Rye 7, Oats 7, Wheat 7.

CHART 2. DATES WHEN SEED ARE AVAILABLE AS GAME BIRD FOOD IN ALABAMA