

FACT SHEET

BOBWHITE FOOD DEVELOPMENT

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Bobwhite quail usually eat well during spring and summer months. Their food supply of ripening seeds is supplemented by insects and green plant material. With the first killing frost, however, the food supply begins to diminish. During the fall and winter, other birds and rodents compete with quail for the summer's seed production. Normal weathering of seeds also depletes the supply. The usual critical food period runs from mid-winter into early spring after the fall seed supply is depleted but before green vegetation and insects are available with warmer weather.

Bobwhites eat a great variety of seeds ranging in size from a pinhead, such as carelessnessweed, to acorn-size. Quail eat more than 100 kinds of plants growing in Texas. No one type of plant can meet all of the quail's needs, thus many plants are important. Providing a variety of plants is the key to a dependable food supply throughout the year.

Identify Food Plants

Determine which food plants are present as the first step in food development. A number of studies have been conducted in Texas to determine what quail eat. Although quail eat seeds from many plant species, only a few furnish the bulk of the diet at a given location. Identify these important species and direct development toward them. A list of important Texas quail food plants is contained in Table 1. Several species are included in a general name such as ragweed or doveweed.

To identify locally important food plants take contents from quail crops during the hunting season, particularly the last half of the season. Remove contents, place on a paper towel and dry to prevent spoilage. After drying, store the material in plastic bags or pill bottles. Simply comparing the crop contents with plants and seeds in the area where the birds were

Table 1. Important Texas bobwhite food plants (herbaceous)

Ragweed	<i>Ambrosia spp</i>
Doveweed, goatweed	<i>Croton spp</i>
Carelessnessweed, pigweed	<i>Amaranthus spp</i>
Bundleflower	<i>Desmanthus spp</i>
Sensitivebriar	<i>Shrankia spp</i>
Wildbean	<i>Strophostyles spp</i>
Snoutbean	<i>Rhynchosia spp</i>
Sunflower	<i>Helianthus spp</i>
Partridge pea	<i>Cassia spp</i>
Snow on-the-mountain	<i>Euphorbia marginata</i>
Paspalum grass	<i>Paspalum spp</i>
Dayflower	<i>Commelina spp</i>
Broomweed	<i>Xanthocephalum dracunculoides</i>
Sumpweed, marsheklar	<i>Iva spp</i>
Bluestem pricklepoppy	<i>Argemone intermedia</i>
Stevens snadlily	<i>Mentzelia stricta</i>
Western indigo	<i>Indigofera leptosepala</i>
Tick trefoil	<i>Desmondium spp</i>
Panic grass	<i>Panicum spp</i>
Lespedeza	<i>Lespedeza spp</i>
Crotonopsis	<i>Crotonopsis linearis</i>
Nutrush	<i>Scleria ciliata</i>
Knotweed	<i>Polygonum spp</i>
Queensdelight	<i>Stillingia sylvatica</i>
Mexicanclover	<i>Richardia spp</i>

taken will aid in identifying most plants. Books such as *Seed Identification Manual* by A. C. Martin and W. B. Barkley, University of California Press also are helpful. Only a hand lens is needed to use these picture guides.

Fruits or mast of woody plants also may contribute significantly to the food supply and woody plants provide needed cover. Protect important species from herbicides, mowing or livestock grazing. Some important woody species are listed in Table 2. To identify locally important species use the same procedure as outlined for herbaceous plants. "Woody-Plant Seed Manual," U.S. Department of Agriculture Miscellaneous Publication 654, is a good reference on woody plants.

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Increase Food Supply

The most dependable food development results come from encouraging existing food plants rather than introducing new ones. Preserve strips or patches of good quality native weeds when mowing or spraying pastures. If grass cover is heavy, limited disking helps decrease grass competition with quail food plants.

Unharvested strips or rows of farm grains left along field margins adjacent to grassland, shelterbelts or brushy fence rows supplement the food supply at a lower cost than plantings in separate plots.

Table 2. Important Texas bobwhite food plants (woody)

Oak	<i>Quercus spp</i>
American beautyberry	<i>Callicarpa americana</i>
Pine	<i>Pinus spp</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Sweetbay	<i>Persea borbonia</i>
Woollybucket bumelia	<i>Bumelia lanuginosa</i>
Sumac	<i>Rhus spp</i>
Hackberry	<i>Celtis spp</i>
Grape	<i>Vitis spp</i>
Ash	<i>Fraxinus spp</i>
Blackgum	<i>Nyssa sylvatica</i>
Blackhaw	<i>Virburnum spp</i>
Flowering dogweed	<i>Cornus florida</i>
Inkberry	<i>Ilex spp</i>
Redhaw	<i>Crataegus spp</i>
Waxmyrtle	<i>Myrica cerifera</i>
Sassafras	<i>Sassafras albidum</i>
Mesquite	<i>Prosopis glandulosa</i>
Prickly pear	<i>Opuntia lindheimeri</i>
Tasajillo	<i>Opuntia leptocaulis</i>
Granjeno	<i>Celtis pallida</i>

Fire is useful in improving bobwhite habitat. However, satisfactory burning techniques have been established only in the pine areas of East Texas. Because of the potential hazards associated with fire, conduct burning only with the assistance of the Texas Forest Service.

For quail to get maximum benefit from food patches, plots should be within 50 to 75 yards of good low, woody vegetation which the birds can use as protective cover (the closer, the better). A number of food strips or small patches (¼ acre) with good cover distributed over a pasture is superior to a single large plot or field.

Disking

Disking and allowing the plowed land to lie fallow is the cheapest method, other than burning, to increase quail food supply. This method reduces grass competition and gives weeds a comparative growth advantage. One attribute of weed seeds is their resistance to deterioration. Many weed seeds lie dormant in the soil for years until a soil disturbance causes

them to germinate. Disking simply takes advantage of a quail food crop which is already planted.

Disking to a 4-inch depth is all that is required. Use any pattern within flight distance (¼ mile) of good cover. One of the simplest patterns involves working long strips of at least 20 feet wide along the edge of cover. Since plowed strips usually produce for at least 2 years, plow new strips the second year. When grass begins to suppress food plants, begin reworking old strips.

The best disking time is January, February and March, although anytime between the first frost in the fall and the following May is satisfactory. Probably ½ to 1 acre of disked strips per covey is sufficient, depending upon the amount of seeds produced.

Fertilization

To obtain optimum seed production on a given food plot, fertilization may be necessary. In cultivated crops, fertilization rates are known for various Texas soils. A soil test establishes the amount of fertilizer needed per acre for a particular plant.

Fertilization rates for native plants are not established. Therefore, some guidelines are suggested. Fertilize at the rates recommended locally for pasture legumes. Broadcast over the soil immediately following the first disking. It is not necessary to cultivate into the soil. The objective is to increase seed production but not to fertilize to the point of stimulating rank vegetative growth, particularly competitive grass species.

Food Plantings

Food from plantings and quail feeders has been recommended as a cure-all for increasing quail populations. Bobwhite populations increase if food is limited and if plantings or feeds correct this deficiency. But, if food is not limited, additional food patches have no effect on quail numbers. Correct the limiting deficiency — i.e. escape or nesting cover — to increase quail numbers. Adding food, however, may help in other ways.

During the "fall shuffle" when quail tend to move, an abundant food supply holds most birds in the area where they hatched. Coveys are attracted to an abundant supply of choice food that quail can find easily. This makes hunting more predictable.

Each plant species has its own growth habits and matures its seeds at a particular time; therefore, each plant can fill a particular food need. Planting several kinds of plants is preferable over using a single species. However, differences in growth habits, fertilizer requirements and maintenance needs dictate that plots be sowed in pure stands rather than mixtures of plants. This does not preclude single species plantings being made adjacent to each other. More separate plantings are required but seed production per plant increases.

Successful plantings require care to insure good seed yield, and most require replanting yearly. While wild plants may require less attention, simply strewing seeds on the soil does not guarantee plant establishment or a seed crop. Prepare a proper seedbed for all plantings.

Species considered for plantings should be adapted to the climate and soil at the intended location. An important food plant in Wisconsin, Pennsylvania or Florida will not necessarily be appropriate for Texas conditions. As examples, Russian olive is used in the northeast; bicolor lespedeza in the southeast; Korean lespedeza in the latitude of Missouri, Kentucky and Virginia; Florida beggarweed along the sandy soils of the southeast coastal plain; and sericea primarily in the north. For various reasons these plants have not been successful in Texas; although, they are very useful in the adapted areas.

Cultivated grains have several characteristics

which restrict their use as quail food plants in some areas of the state. They have thin seed coats which allow seeds to deteriorate rapidly when exposed to moist soil. They are less drought resistant, hence less dependable as a food source than native weeds. Small plots of cultivated grains also may be attractive to blackbirds, rodents, deer and/or livestock, particularly in rangeland or forests when isolated from similar crops. These characteristics limit use of cultivated grains although some of these weaknesses can be overcome through management — i.e. fencing to exclude deer or livestock. However, it is important to encourage native weeds simultaneously with any use of cultivated grains to attract and hold quail.

Extensive research in determining the best plants for quail food plots in the various regions of Texas has not been conducted. Therefore, the following plants are suggested as possible plantings on the basis of limited studies, their known agronomic use within the state and/or their existence as wild plants in Texas.

Browntop millet: <i>Panicum fasciculatum</i>	Planting date:	April to June; 55 to 60 days to maturity
	Planting rate:	15 to 20 pounds per acre; broadcast followed with light harrowing
	Seedbed:	Tilled; smooth; firm; cover seed 1 inch
	Soils:	Grows best on fertile, well-drained soil; 30-inch rainfall; eastward; fertilize as for small grains; pH - 6.0
	Comments:	Susceptible to livestock grazing and some use by deer; seeds attractive to blackbirds and doves
German millet: (a variety of foxtail millet) <i>Setaria italica</i>	Planting date:	April to July; 75 to 80 days to maturity
	Planting rate:	10 to 20 pounds per acre
	Seedbed:	Tilled; smooth; firm; cover seed 1 inch with light harrowing
	Soils:	Adapt to most soils of Central Texas; generally not grown in the more humid areas east of the blacklands
	Comments:	Susceptible to livestock grazing
Proso millet or broom corn: <i>Panicum miliaceum</i>	Planting date:	April to June; 75 days to maturity
	Planting rate:	15 to 20 pounds per acre; broadcast
	Seedbed:	Tilled; smooth; firm; cover seed 1 inch with light harrowing
	Soils:	Well-drained soils; pH - 6.0; requires less water than winter wheat
	Comments:	Seed attractive to many bird species; susceptible to livestock grazing
Sesame, "benne": <i>Sesamum indicum</i>	Planting date:	Soil temperature 75° F; about 1 month after last killing frost; 120 to 150 days to maturity
	Planting rate:	10 pounds per acre; broadcast
	Seedbed:	Moist; mellow and weed-free; cover seed 1 to 2 inches
	Soils:	Does best on fertile, neutral, medium textured soils or high salt concentrations; needs well-drained soil; pH - 6.5 to 7.0
	Comments:	Use shattering varieties — Margo, Blanco, Dulce; sesame seedlings are small and do not tolerate much competition from weeds.
Sunflower: <i>Helianthus annuus</i>	Planting date:	May to June; 110 to 120 days to maturity
	Planting rate:	5 to 7 pounds per acre; broadcast
	Seedbed:	Cover seeds 1 to 2 inches; moist soil

	Soils:	Fertile soils with well-drained subsoils; will tolerate moderate salinity and high lime soils
	Comments:	Drought tolerant; susceptible to head-feeding birds; deer and cattle may graze plants in early months.
WGF sorghum:	Planting date:	May to July
<i>Sorghum vulgare</i>	Planting rate:	5 to 10 pounds per acre; broadcast
	Seedbed:	Well prepared; firm; cover seed 1½ inches
	Soils:	All soils; pH - 5.8 to 6.2
	Comments:	Wild Games Feed sorghum developed for quail by Oklahoma State University; is susceptible to deer and livestock grazing; less attractive to blackbirds than most grain sorghums; fertilize for grain sorghum.
Sesbania, coffeeweed:	Planting date:	Spring after last killing frost; 90 days to maturity
<i>Sesbania macrocarpa</i>	Planting rate:	15 pounds per acre; broadcast
	Seedbed:	On dry soil; well prepared; firm; cover seed ¾ to 1 inch
	Soils:	Is best adapted to wet, heavy soil; can broadcast on mud flats
	Comments:	Inoculate seed; fertilize with phosphate and potash — 0-14-14 @ 300 pounds per acre; generally not grazed by cattle or deer
Hardshell, cowpea	Planting date:	April to May
<i>Vigna sinensis</i>	Planting rate:	10 to 15 pounds per acre; broadcast
	Seedbed:	Disk; firm; cover seed 1 inch
	Soils:	Moist soils except deep sands
	Comments:	Susceptible to heavy deer grazing. Inoculate seed.
Partridge pea:	Planting date:	March to April; 150 days to maturity
<i>Cassia fasciculata</i>	Planting rate:	10 to 15 pounds per acre; broadcast; scarify seeds
	Seedbed:	Disk; firm; cover seed lightly with harrow
	Soils:	Grows best on moist sites with moderately high lime soils; pH - 6.0 to 6.5
	Comments:	Responds to lime; fertilize with phosphate and potash before planting — 0-14-14 @ 300 pounds per acre; rejuvenate a sparse stand by disking.
Kobe lespedeza: (a variety of common lespedeza)	Planting date:	February to March
<i>Lespedeza striata</i>	Planting rate:	25 to 30 pounds per acre; broadcast
	Seedbed:	Disk and harrow; firm seedbed; leave seeds on surface if it is slightly rough.
	Soils:	Adapt to damp and well-drained soils, except deep sands or high lime soils; pH - 6.0 to 6.5
	Comments:	Fertilize with phosphate and potash; inoculate seed; fire will kill growing plants; subject to livestock grazing
Common lespedeza:	Planting date:	February to March
<i>Lespedeza straita</i>	Planting rate:	15 to 20 pounds per acre; broadcast
	Seedbed:	Disk and harrow; firm seedbed; leave seeds on surface if it is slightly rough.
	Soils:	Adapt to damp and well-drained soils, except deep sands or high lime soils; pH - 6.0 to 6.5
	Comments:	Good to use when it can be volunteered; inoculate seeds; re-seeds well on clay soils; fertilize with phosphate and potash; fire will kill growing plants; subject to livestock grazing.

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