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EMERGENCY ALTERNATIVE CROPS FOR SOUTH TEXAS

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Emergency alternative crops are selected mainly for dryland situations where disastrous weather events such as hail, freezing temperatures, flooding, and spring drought have severely damaged an established crop or have delayed planting beyond realistic planting dates. Maintaining a damaged stand could result in accepting further plant population losses, worsening weed problems, and risking reduced yields. Such situations may not be worth the cost of management and harvesting.

Replanting using the same full-season crop may not be practical because of approaching hot weather and low rainfall. If planting moisture is still available, planting a shorter-season variety or hybrid of the same crop may still be possible. In South Texas, most of these problems occur in early April through mid-May. If it's too late to replant weather-sensitive crops like corn or cotton, then an alternative crop may be considered.

Under irrigated conditions, the most important considerations are marketing, timing, and selecting the most profitable crop. However, under dryland conditions the remaining soil moisture and rainfall/temperature outlook may be equally important in avoiding a second crop failure.

For dryland producers, the goal is to establish a crop quickly in order to realize some return on the initial investment. Ideally, these crops are expected to mature in less than 90 to 100 days and not to exceed an August-September harvest date. Harvest and tillage operations after these dates increase the risk that there won't be enough time to receive the necessary rainfall to recharge the subsoil with water or to provide start-up moisture for the next planting season.

NINE BASIC QUESTIONS

After realizing that planting a different crop is the only option (opposed to doing nothing), consider these nine questions.

- Do I have a crop with a potential for profit?
- Do I have planting moisture and enough soil-stored moisture to carry forward to the next rainfall?
- Do I have a market to sell to?
- Do I have the management skills to grow the new crop?
- Is special labor required by the new crop?
- Is seed available soon enough?
- Is special equipment required?
- What are the risks?
- Are there any carryover herbicide-residue, weed, insect, or disease problems?

WATER REQUIREMENTS

Crop water use depends on the length of growing season, location, and crop type. The common method of predicting crop water use is to multiply the average historic potential evapotranspiration (PET or ETo) by the plant's crop coefficient (Kc). The Kc value represents the percentage of the PET the specific crop will use for maximum production and is expressed as a decimal.

In Table 1, predicted water requirements are provided for different crops. These values are based on average historic potential evapotranspiration and crop coefficients and represent the amount of water that must be supplied by rainfall and/or irrigation. These requirements may change with unseasonable weather conditions. Group 1 lists crops ideally used for late planting when conditions are wet. Group 2 lists crops more efficient under conditions going into hot, dry weather.

SOYBEANS

Most of the soybean acreage planted in South Texas is the result of an unusual or disastrous weather event. Because soybeans require ample water, dryland production is normally limited to counties north of San Patricio County. Group IV soybeans are one of the

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TABLE 1. ALTERNATIVE CROPS IDENTIFIED BY WATER STATUS AT PLANTING, WATER DEMAND FOR PRODUCTION, AND POTENTIAL RETURNS FOR INVESTMENT.					
ALTERNATIVE CROP SELECTED	AVG. LATEST PLANTING DATE	GROWING SEASON (DAYS)	CROP COEFFICIENT (KC)	CROP WATER REQUIREMENTS (IN.)	RETURNS/ PROFITABILITY
Group 1					
Soybeans (seed)	April 15	140	0.65	21.8	+++
Cowpeas (seed)	April 15	90	0.60	12.7	++
Sunflowers (seed)	April 15	90	0.60	13.7	++
Mungbeans (seed)	April 15	100	0.65	14.7	+
Group 2					
Haygrazers (1 cutting)	April 15	35	0.75	8.2	+
Haygrazers (2 cutting)	April 15	65	0.75	12.9	++
Sorghum (grain)	April 15	110	0.70	18.4	+++

*Crop water requirement = PET x Kc

Note: Any profitability is contingent on the presence of a market or a willing buyer. This matrix is provided for planning purposes only. Production will vary with water supply and growing conditions. If drought prevents the new crop from being harvested, it can be used for grazing or as a soil builder.

better replant choices for cotton crop failures because their prime planting dates extend to April 15, and the herbicides used are often the same as those used for cotton.

Yields of late-planted soybeans can be less than yields for those planted on earlier (optimum) planting dates. In contrast to most other oil seed crops, there is an established market for handling soybeans along the Texas Gulf Coast. Transportation is the largest drawback to areas furthest from port facilities or receiving elevators.

Adequate water is needed throughout the first two-thirds of their growing season to build enough plant structure (height and internodes) to produce good seed yields. Early- to mid-season moisture stress can result in short plants with low internode numbers, aborted seed ovules and pods, and low seed yields. Good yields are not usually possible unless some rainfall is received during the blooming phase.

Late-season moisture stress also limits seed yields. It is not uncommon for a producer to plant soybeans in what (up to that time) has been a wet year. Drawing on stored soil moisture, these plants achieve nearly full height only to have it turn dry with no subsequent rainfall. Too often, remaining moisture is not sufficient to fill out the pods and seed size will be too small (shot-size). Under these conditions, a great plant structure is produced with basically no seed weight. About all that can be done to utilize the damaged crop is to turn in livestock, make soybean hay, or to shred down the top growth as a soil builder.

For these reasons, soybeans are usually attempted only **in higher rainfall areas** where corn or cotton planting was excessively delayed by wet field conditions.

In high rainfall areas experiencing a spring drought, planting moisture and seeding depth may be of concern. Soybeans will be skippy and ragged if moisture in the seed furrow is not uniform. Seed can be dry-planted, but its germ seldom retains vigor for more than 2 to 3 weeks if soils are hot. Seeding depths greater than 2 to 2½ inches (to moisture) are risky. If a hard rain comes before the stand is fully emerged, a rotary hoe or picker wheel may be essential to breaking crusted soils and getting the stand up. These tools may reduce plant populations 10 to 15 percent. The best plantings are made 1 to 1½ inches deep to a firm seedbed with good soil moisture. If atrazine was recently applied, soybeans cannot be grown on these soils. See Texas A&M AgriLife Extension publication SCSC-PU-090 for more information on planting soybeans.

COWPEAS

Peas are primarily grown for processing (canning), forage, seed, wildlife plots, or soil building. Shortages of certain types of seed in recent years have caused a significant increase in seed cost for some types. Consequently, if the growing season permits, a quality seed crop is much more profitable than other uses mentioned.

One of the risks of pea production is weathering. A rain-delayed harvest greatly reduces seed value. A good pea crop has the potential to net more money than mungbeans, $100 + per acre. Creams, crowders, and purple hulls are edibles and can be sold to food processors. Because the canning industry's chief concerns are with seed uniformity and cosmetic appearance to the consumer, price docking can be expected if the processors' standards are not met.

Planting Requirements

Depending on the variety, seeding rate is 25 to 35 pounds per acre for an in-row plant spacing of 1½ to 2 inches. Seed should be planted to moisture, normally 2 to 2½ inches deep. Row spacings of 30 to 38 inches have been successful. Apply appropriate seed inoculation, as peas require specific strains that are different from soybeans and many other types of legumes.

Planting on flat-topped, shaped beds improves the planting surface and harvesting efficiency. Some varieties tend to set peas close to the soil surface, and a flex-cutter bar will not permit gathering of the brush as readily on bedded land. Fewer pods will be severed or left behind with flat plantings. Bush-type varieties such as Texas Pinkeye (purple hull) alleviate many of the harvest problems experienced with vining types.

Site Selection

Soils should be fertile, well-drained, with a pH of 7 to 7.5. Deep sandy loams are extremely well-suited, because pods are less likely to be diseased or stained.

Heavy soils such as coastal clays tend to seal rapidly and absorb standing water slowly. This lack of internal drainage promotes greater surface humidity, molds, and foliar diseases.

Fertilization

Incorporate fertilizer according to the results of a soil test. Depending on native potash levels, soils may require more phosphorus than either nitrogen or potash. Typical dry fertilizer includes 200 to 300 pounds of 10-20-10 or 16-20-0. Liquid fertilizers may require 100 to 150 pounds of 9-27-0 or 10-30-0. If applied at planting, ensure placement 2 to 3 inches below the seed row.

Weed Control

Banding (12-inch bands on 36-inch row spacings) is more cost-effective than broadcasting. Band the bed with 0.33 to 0.5 pints per acre of Treflan or 0.4 to 0.6 pints per acre of Prowl plus 0.5 to 0.66 pint per acre of Dual. Other herbicides may also be cleared for use on field peas. Consult label directions for information.

Irrigation

Total in-season irrigation water requirements could be 6 to 8 inches. Good subsoil moisture eliminates the need for irrigation. If irrigation is necessary to obtain a stand, it is better to preirrigate than to water up. Delaying watering during the first 2 to 3 weeks will permit deep rooting. If needed, the second watering should be made midway through the vegetative period (bushing).

An additional 1½ to 2 inches of water just prior to bloom may be needed to provide good pod set. For seed or table peas, an additional watering to fill the pods may be necessary.

Characteristics of Peas

Peas will bloom in 45 to 50 days and are usually ready to harvest in 75 to 90 days. Plant heights average from 18 to 30 inches, depending on the season and variety. Pea distribution within the plant will vary. Some varieties set pods in the top of the bush and others throughout the plants. Temperatures exceeding 97°F during blooming will reduce yields.

Insects

A well-managed insect control program is a must for successful production. Thrips, lice, and lygus bugs are the major insect problems. Penncap-M at 2 to 4 pints per acre, or dimethoate 4EC at 0.5 pint per acre is effective in controlling these species.

Lygus or cowpea curculio treatments should be made at bloom initiation, with a follow-up spray in 5 to 7 days. If these insects are present, waiting until a bloom is observed is too late. Peas may have to be sprayed for control of chinch bugs. Treatments will not be effective unless started when peas are in the green state.

Alternate insecticides include dimethoate at 0.5 pint per acre, Penncap-M at 2 pints per acre for thrips or aphids. Asana can be used at the 1.7 to 3.4 ounces per acre rate for armyworms. Thiodan also provides satisfactory control for thrips and aphids when used at the 0.66 to 1.3 quarts per acre rate. Lannate LV can be used at 1.5 to 3 pints per acre for armyworms and stinkbugs. Sevin XLR at 1 to 1.5 quarts per acre is also acceptable for armyworms and stink bugs.

TYPES OF PEAS

Edibles (Creams, Crowders, Pinkeye Purple Hulls, and Blackeyes)

The majority of the blackeye peas are grown on contract for canning companies. Contact the canning (food processing) company well before you plant in order to obtain a contract and to determine acceptable varieties and necessary quality standards. Usually the processors receive the peas (by truck) on the turnrow. Coordinate harvest on the turnrow using their trucks. Most companies have field men who provide technical information and assistance in meeting their production and product quality needs. Viruses can be a major problem.

Forage Types (Field Peas, Cowpeas, Iron and Clay, Chinese Reds)

These peas are grown as an alternate or emergency type of forage. If they are not planted early, weeds will be a serious problem. These peas have a low nitrogen input, and they emerge rapidly with little moisture. Spring-planted crops will flower in August. Plant heights commonly reach 3 to 5 feet with lots of foliage. Growth is rapid. The forage types do not seem to have many foliar disease problems. However, deer love them and can be a serious problem when the peas are not intended as a wildlife feed.

Field peas can be grown in the summer as a forage or as a high-quality hay. The older varieties appear to perform better than the more recently released varieties. Iron and clay peas were formerly two separate varieties. Over the years they have become mixed, but they are predominantly the iron type. The name refers to seed color (iron being reddish; clay being buff-colored). These types are produced largely in Arkansas and Texas (in the Denton area they are rotated with small grains).

Iron and clay peas do well on poor land with shallow soils, and will tolerate a wide pH range. The peas are usually planted at 25 to 50 pounds per acre after the danger of frost has passed. Seed costs have been $35 to $45 per hundredweight, depending on demand, availability, and transportation costs. Chinese Reds are often more readily available than iron and clay (seed costs are comparable to iron and clay types).

ALYCE CLOVER

Alyce clover is a warm-season, annual legume that can be grown for hay, grazing, and soil building. Because it requires more summer rainfall than other forage crops such as haygrazers, production is limited to the mid- to upper Gulf Coast of Texas.

Because Alyce clover fixes its own nitrogen, only phosphorus and potassium are needed (as indicated by soil test recommendations). Alyce clover is sensitive to drought. Growth usually will not resume once the plant is stunted by drought. It is usually too dry on the Texas Gulf Coast for the best Alyce clover production.

Alyce clover should be seeded in May and June at a rate of 15 to 20 pounds per acre. Suggested planting depth is ¼ to ½ inch. Seed should be inoculated with Alyce clover inoculum before planting. One to two cuttings of good- to high-quality hay can be expected. Result demonstrations in Lavaca and Victoria Counties have shown Alyce clover can be grown, but the yields are below those of haygrazers or millet.

MUNGBEANS

Mungbeans are a low-input crop having fewer problems than peas. Mungbeans can also be used for soil building, but not for forage. Anticipated mungbean yield is around 500 pounds per acre. Production cost to the grower has averaged 14 cents per pound in recent years, resulting in $60 to $70 per acre profit.

SORGHUMS AND HAYGRAZERS

These crops have excellent drought tolerance when compared to most legumes. Because seed size is small, less planting moisture is required for germination. Of all the possible selections possible as a dry-year alternative crop, "drought cutters" like sorghum or haygrazers have the best chance for success.

When planting moisture is marginal, germination and emergence may not be uniform, resulting in mixed plant ages in various parts of the field. Sorghum seed will remain viable several weeks if not partially sprouted.

Once established, sorghum will almost always provide some grain. Its consistency in dry seasons and absence of aflatoxin are virtues to any farmer. Unlike corn, sorghum plant growth is reduced as its waxy leaves roll under drought conditions. It will use less mid-season rainfall accordingly. Table 2 indicates the value of supplemental rainfall to sorghum yields.

Sorghum and haygrazer plantings will also fail if there is only enough soil moisture to germinate the seed and the roots can't reach adequate subsoil moisture. Under these conditions the new seedlings rapidly wilt and dry up. Replanting may be possible following adequate rainfall and soil profile recharge.

Grain Sorghum

Sorghums, once established and rooted, use water more efficiently and will produce dry matter on less water than most other crops. Sorghum requires at least 90 to 110 days and sufficient heat units to mature the crop before freezing weather. Some of the earlier medium hybrids are superior to longer-season or short-season selections planted late or in years with drought late in the growing season. These earlier medium types will bloom earlier and may mature grain before conditions worsen.

If planting moisture is not limiting, often sorghum will produce more grain if planted in early June rather than in May. Sorghum does not require much water until it passes into the 7-leaf stage. Sorghum can significantly benefit from August and September rainfall if it is received through booting and blooming stages of growth. When planting has been delayed by an extremely wet spring, plantings as late as June 15 have enabled limited grain production.

Sorghum needs 15 to 25 inches of usable soil moisture for maximum grain production. It uses 12 percent fewer pounds of water per pound of dry matter than corn and can tolerate drought best between the 7-leaf stage and early boot (20 to 40 days post planting). Yield decreases normally occur when sorghum is limited in water from early bloom to soft dough growing stages. One inch of additional rainfall during this period of peak use may result in 700 to 1,000 pounds of additional grain per acre.

Late-planted sorghum will generally experience greater midge pressure. Bird damage may also be an additional problem for isolated small grain sorghum acreages. Late-planted sorghum planted in rows should be established at lower populations (40 to 50,000 plants per acre) to reduce plant height and respective risks from charcoal rot.

TABLE 2. EFFECTS OF ANNUAL RAINFALL AS A COMPONENT OF SORGHUM YIELDS.

RAINFALL (IN.)	SORGHUM (LB./AC.)
18	6500
16	5600
14	4600
12	3700
10	2800
8	1800

Haygrazers

When planting moisture is uneven or declining and grazing or hay is a viable option, haygrazers may be a wise choice. However, higher seedling rates are necessary because less tillering is possible in seasons with low moisture and nitrogen utilization.

Uniform germination and emergence is less important with grazers since no grain is being matured. Successful production of dry-planted almum can occur if rainfall is received within 2 to 3 weeks of planting. Once haygrazers are established, grazing should be possible in 3 to 5 weeks. Haygrazers need at least 35 days to make sufficient growth for the first hay cutting. Haygrazers do not require herbicide applications in most cases since they grow faster than most weeds.

In good times, average round bales of haygrazer may be valued at $20 to $30 each. During prolonged drought or extreme shortage, bales have brought twice this price.

MILLET

Millet has excellent drought tolerance and can be planted for hay, grazing, and wildlife (doves, quail). Millet can be used instead of haygrazers on high-pH soils which have a history of iron chlorosis. First-cutting or graze-down yields are fairly good, but are below that of haygrazer in subsequent harvest. Planting rates are 15 to 25 pounds per acre. Planting dates are April through May. Fertilize according to a soil test recommendation. Harvest prior to boot stage of growth.

OATS AND RYEGRASS

When excessive rainfall delays planting, spring oats or ryegrass may provide high-quality grazing for a limited time. Many oat varieties rust badly in South Texas, and the forage will dry up as hot weather arrives. Oats are heralded for rapid emergence and juvenile growth under ideal moisture conditions. Grazing is practical when 5 to 6 inches of growth has been reached. Unless the season is unusually wet and disease-free, it is unlikely that sufficient test weight and quality will be possible to market oats for grain in South Texas.

SUNFLOWERS

Sunflower production is very risky without prior growing experience and specialty equipment. Sunflowers produce seed efficiently (short growing season) with flexible planting dates. They have tap roots which enable accession of deep moisture during dry growing seasons. Sunflowers are not a miracle crop and are almost always grown on contract with a specific company. The majority of sunflowers grown in South Texas are confectionary types requiring large seed size. Drought normally reduces seed size. When sunflowers are grown for oil seed size is less important. As with contracted crops, an agreement to price and how to handle the harvested seed should be obtained prior to planting. If no contract is available, sunflower seed can be sold to feed mills to be incorporated as a protein source.

OTHER CONSIDERATIONS

In the past, compliance with government programs influenced which alternative crops could be planted without losing base or benefits. Coordination may be important to ASCS, the land-owner, the custom harvester, the elevator storage company, or the contracting company. An alternative crop should be selected only if it can favorably answer most of the questions on page 1 of this publication. A long shot taken in a time of financial risk may only increase losses and problems.

A careful evaluation of plant density should be considered before destroying damaged cotton, corn, or sorghum stands. Many times a partial over-planting or just replanting a few portions of a field may be superior to establishing an alternative crop.

The later a crop matures in the fall, the less time will be available to rework fields. Wet field conditions could delay or prevent timely harvest on the upper Gulf Coast. Late shredding, disking, chiseling, and rebedding may leave fields dry and rough on the lower Gulf Coast.

A wise choice for an alternative crop will have a low establishment cost with the flexibility to adjust inputs **only if conditions continue to improve.** The best alternative crop fully utilizes previous inputs and maximizes growing conditions predicted for your growing area.

FOR MORE INFORMATION

Klosterboer, A. D., T. D. Miller, and S. D. Livingston, "Producing Early-Maturity (Group IV) Soybeans on the Texas Gulf Coast," Texas A&M AgriLife Extension publication SCSC-PU-090, 1996.