

GUIDE LINES

to production costs
and practices



1991 - 1992



IMPERIAL COUNTY

FIELD CROPS

CIRCULAR 104-F

\$4.00

COOPERATIVE EXTENSION
UNIVERSITY OF CALIFORNIA
IMPERIAL COUNTY
1050 E. HOLTON ROAD
HOLTVILLE, CA 92250



FOREWORD

January 1991

Circular 104F, Guide Lines to Production Costs and Practices, contains cost data information for field crops; vegetable crops cost data information can be obtained in Circular 104V. The price of Circular 104-F is \$4.00.

The figures used in the cost data sheet were supplied to the farm advisors by independent contractors, various fertilizer and seed companies, growers, pest control advisors, the Agricultural Commissioners Office, and the Imperial Irrigation District. The figures represent an average of custom rates charged in Imperial Valley. These figures should be used as estimates only, as exact costs will differ for each field and grower.

The cost of production for the commodities described in this publication is dependent on factors such as: soils, pest management, labor, method of irrigation, fertilizer requirement and application methods.

The 12 percent overhead expense of preharvest costs and land rent include office, utilities, insurance, finance charges, supplies, transportation, and other administrative expenses. Land rents are based on either net or gross acreage depending on the crop. The range analysis can also offer a picture of the possible profit or loss situation.

Franklin F. Laemmlen served as main author in the preparation of this publication, and the specific crop responsibilities are as follows.

| | |
|----------------------|--|
| Franklin F. Laemmlen | Alfalfa Seed, Bermudagrass Seed, Sudangrass, Sugar Beets. |
| Juan N. Guerrero | Alfalfa, Annual Ryegrass |
| Carl E. Bell | Cereal Crops |
| Eric T. Natwick | Cotton |

Questions concerning these costs should be directed to the appropriate farm advisor.

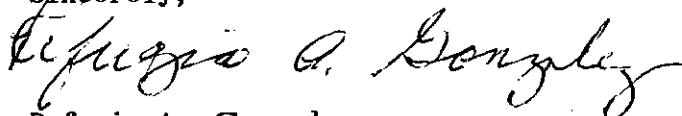
In addition, the following farm advisors contributed in the areas of expertise:

| | |
|----------------------|-----------------|
| Keith S. Mayberry | Custom rates |
| Carl E. Bell: | Weed control |
| Eric T. Natwick: | Insect control |
| Franklin F. Laemmlen | Disease control |

Thanks are expressed to Walter Leimgruber for assistance given in preparation of the cost data sheet.

We welcome suggestions for improvement.

Sincerely,

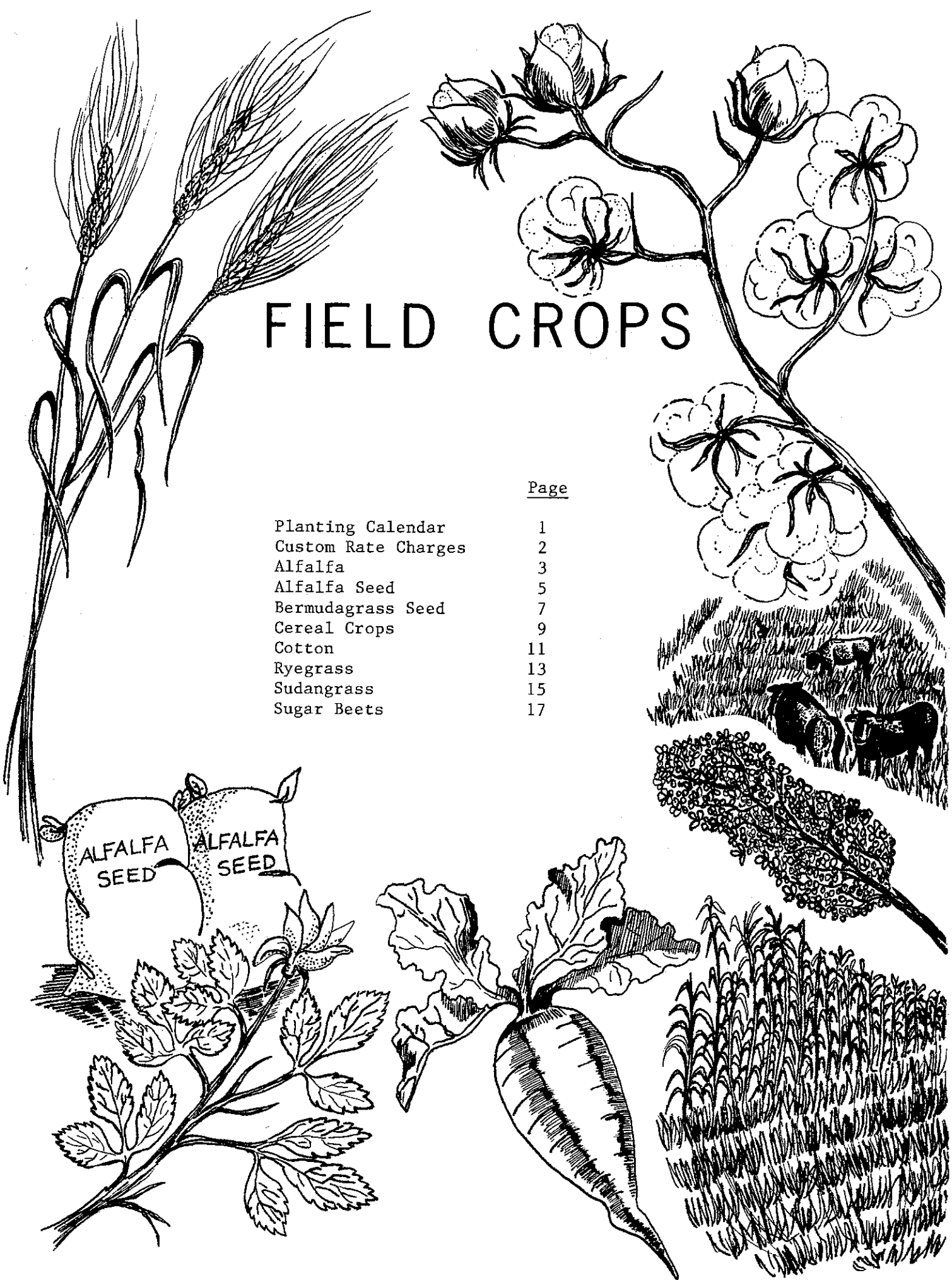


Refugio A. Gonzalez
County Director

FIELD CROPS

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GUIDELINES TO PRODUCTION COSTS AND PRACTICES
 Imperial County Crops, Circular 104F
 1991-1992

CUSTOM RATE CHARGES

| HEAVY TRACTOR WORK | PRICE/ACRE |
|--|-----------------|
| Plow | \$ 24.75 |
| Subsoil 2nd Gear | 29.25 |
| Disc, Regular | 9.50 |
| Disc, Stubble | 18.25 |
| Float | 8.25 |
| Triplane | 8.75 |
| List, Regular | 11.50 |
| Landplane | 10.00 |
| Chisel | 20.75 |
| PLANTING AND CULTIVATING | |
| Plant and Shape Sugar Beet 40" Beds | 15.50 |
| Precision Plant 40" Beds | 14.50 |
| Plant | 13.75 |
| Cultivate 4-Row 30", 40" Beds | 10.75 |
| Spike and Furrow Out (2 row) | 10.50 |
| Lilliston | 9.50 |
| Furrow out alone | 8.00 |
| INCORPORATING, BORDER AND BED WORK | |
| Power Incorporate | 20.25 |
| Scraper Borders | 12.75 |
| Border, Cross checks and Break Borders | 15.00 |
| Roll Beds | 5.00 |
| FERTILIZER APPLICATION | |
| Broadcast Fertilizer | 6.00 |
| Inject Fertilizer (Flat) | 10.00 |
| Fertilize and Furrow Out 30", 40" Beds | 10.50 |
| IRRIGATION | |
| Custom Sprinkle | \$130.00-140.00 |
| HARVEST | |
| Swather | 7.50 |
| Rake | 4.00 |
| MISCELLANEOUS | |
| Motor Grader/Hour | 42.75 |
| Chop Stalks, Etc. | 11.00 |
| Cultipacker | 6.00 |
| Power Incorporate Herbicides | 20.25 |
| Ground Spray Pesticides (4 Row) | 7.50 |
| Aerial Spray 5 Gal. (Insecticide) | 4.75 |
| Aerial Spray 10 Gal. (Fungicides) | 5.00 |

ALFALFA
PROJECTED PRODUCTION COSTS
1991-1992

Mechanical operations at custom rates. Hand labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment insurance and fringe benefits).

Yield--8.0 tons per acre.

| OPERATION | CUSTOM RATE | MATERIALS | | HAND LABOR | | COSTS Per Acre |
|---|---|--------------------|-------|------------|---------|----------------|
| | | Type | Cost | Hours | Dollars | |
| LAND PREPARATION | | | | | | |
| Plow or Subsoil | 24.75 | | | | | 24.75 |
| Disc 2x | 9.50 | | | | | 19.00 |
| Fertilize | 8.00 | 260# 11-52-0 .15/# | 39.00 | | | 47.00 |
| Build & Break borders | 15.00 | | | | | 15.00 |
| Flood | | 1/2 ac ft | 5.75 | 1 | 5.75 | 11.50 |
| Disc 2x | 9.50 | | | | | 19.00 |
| Landplane 2x | 10.00 | | | | | 20.00 |
| Border, dump | 13.00 | | | | | 13.00 |
| Float | 8.25 | | | | | 8.25 |
| TOTAL LAND PREPARATION COSTS | | | | | | 177.50 |
| COST OF ESTABLISHMENT | | | | | | |
| Weed Control | 8.75 | Herbicide | 13.00 | | | 21.75 |
| Planting | 10.50 | 20# seed @ 1.45/lb | 29.00 | | | 39.50 |
| Irrigate 2x | | 1 ac/ft | 11.50 | 2 | 11.50 | 23.00 |
| Insect Control 1x | 4.90 | Insecticide | 7.00 | | | 11.90 |
| COST OF ESTABLISHMENT | | | | | | 96.15 |
| TOTAL COST OF STAND ESTABLISHMENT | | | | | | 273.65 |
| Annual Costs of Hay Production--3 Year Life | | | | | | |
| Weed Control | 4.90 | Herbicide | 24.00 | | | 28.90 |
| Irrigate 16x | | 6.5 ac ft | 74.75 | 9 | 51.75 | 126.50 |
| Fertilize | 6.00 | 90# P205 @ .12/lb | 10.80 | | | 16.80 |
| Insect Control 4x | 4.90 | Insecticide | 46.00 | | | 65.60 |
| TOTAL ANNUAL CULTURAL COSTS | | | | | | 237.80 |
| Land Rent (net acres) | | | | | | 190.00 |
| Amortization-- | 33% of total cost of stand establishment | | | | | 90.30 |
| Cash Overhead-- | 12% of annual costs, land rent and amortization | | | | | 62.17 |
| TOTAL PREHARVEST COSTS | | | | | | 580.28 |
| HARVEST COSTS | | | | | | |
| Swather 7x | 7.50 | 7 times | | | | 52.50 |
| Rake 9x | 4.50 | 9 times | | | | 40.50 |
| Bale | 10.50/ton | 8 tons | | | | 84.00 |
| Haul & Stack | .25/bale | 16 bales/ton | | | | 32.00 |
| TOTAL HARVEST COSTS | | | | | | 209.00 |
| TOTAL ALL COSTS | | | | | | 789.28 |

PROJECTED INCOME ABOVE COSTS (PER ACRE)
price/ton

| | | price/ton | | | | | | | Breakeven \$/ton |
|------|----|-----------|------|------|-----|-----|-----|-----|------------------|
| | | 70 | 80 | 90 | 100 | 110 | 120 | 130 | |
| | 7 | -285 | -215 | -145 | -75 | -5 | 65 | 135 | 111 |
| Tons | 8 | -229 | -149 | -69 | 11 | 91 | 171 | 251 | 99 |
| per | 9 | -174 | -84 | 6 | 96 | 186 | 276 | 366 | 89 |
| acre | 10 | -118 | -18 | 82 | 182 | 282 | 382 | 482 | 82 |
| | 11 | -63 | 47 | 157 | 267 | 377 | 487 | 597 | 76 |

ALFALFA CULTURE

1991-1992

| <u>YEAR</u> | <u>ACRES</u> | <u>YIELD/ACRE (TONS)</u> | <u>VALUE/TON</u> |
|-------------|--------------|--------------------------|------------------|
| 1989 | 170,339 | 9.8 | \$100 |
| 1988 | 189,008 | 8.8 | 85 |
| 1987 | 186,627 | 8.7 | 79 |
| 1986 | 176,900 | 8 | 65 |
| 1985 | 156,200 | 9 | 85 |

SOIL PREPARATION: A uniform seed bed is a prerequisite to a good stand. High and low spots in the field cause uneven irrigation, resulting in poor stands. A well-drained field is also necessary to lessen the likelihood of salinity, scald, and root rot problems. Most growers will plow and others will subsoil for preplant soil preparation. Planting alfalfa on 40 inch beds is now common practice on heavy soils where drainage is a problem.

PLANTING RATES: One pound of seed per acre will provide 4 to 5 seeds per square foot. At 15 pounds per acre 60 to 75 seeds per square foot are sown. Growers use 15 to 30 pounds seed depending on condition of their field, cost of seed, method of planting and time of planting.

PLANTING DATES: Late September through November is the preferred time for planting. Later plantings often result in poor germination and heavy weed infestations. Spring plantings, if necessary, are suggested in February and March.

VARIETIES: Select public or commercial proprietary varieties which have resistance to the spotted alfalfa aphid, the blue alfalfa aphid, and superior yielding ability for the soil type on which you are planting.

FERTILIZATION: Approximately 100 pounds of phosphate is taken from the soil by each 7-8 tons of alfalfa. This must be replaced to maintain maximum hay production. A preliminary application of at least 100-150 pounds of phosphate per acre is recommended prior to planting. On soil low in nitrogen, 20-30 pounds of nitrogen stimulates seedling growth. A deficiency in nitrogen may occur on virgin soils recently brought into production. Additional annual applications of 100 pounds of phosphate are recommended.

IRRIGATION: One to 3 irrigations per cutting are necessary depending on the type of soil and time of year.

PEST CONTROL: The spotted alfalfa aphid can cause damage on nonresistant alfalfa. Control is sometimes necessary for the Egyptian alfalfa weevil and for the pea aphid in February and March. The blue aphid may require additional insecticide costs on alfalfa hay. Alfalfa caterpillar and beet armyworm usually require control in mid to late summer. Occasionally, cutworm outbreaks occur in fall and spring months. Root rots caused by Rhizoctonia and Phytophthora spp. can be severe problems. Consult pest control farm advisors for most efficient procedures. Alfalfa planted on beds are more susceptible to cutworm damage than flat planted alfalfa.

HARVESTING: Alfalfa is normally baled from March until October. During winter months both pasturing and green chopping are practiced. Both pasturing and green chop may return from \$45 to \$65 per acre for the winter months. In 1989, 134,500 acres were pastured.

FLAT PLANTED ALFALFA SEED
PROJECTED PRODUCTION COSTS
1991-1992

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Mechanical operations at custom rates. Labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment and fringe benefits).

Typical yield of 300 pounds of clean seed in 90 days on an established alfalfa stand.

| OPERATION | CUSTOM RATE | MATERIALS | | HAND LABOR | | COSTS Per Acre |
|---------------------------------------|-------------|---------------------------------|-------|------------|---------|----------------|
| | | Type | Cost | Hours | Dollars | |
| SEED PRODUCTION COSTS | | | | | | |
| Irrigate 4x | | Water 2 ac/ft | 23.00 | 2 | 11.50 | 34.50 |
| Insect Control 3x | 4.90 | Insecticides | 50.00 | | | 64.70 |
| Bees | | 3 colonies @ 18.50 | 55.50 | | | 55.50 |
| Defoliation | 6.00 | | 15.00 | | | 21.00 |
| TOTAL GROWING PERIOD COSTS | | | | | | 175.70 |
| GROWING PERIOD & LAND RENT | | | | | | |
| Land Rent (net acres) | | | | | | 140.00 |
| Cash Overhead-- | | 12% of preharvest and land rent | | | | 37.88 |
| TOTAL PREHARVEST COSTS | | | | | | 353.58 |
| HARVEST COSTS | | | | | | |
| Combining | 45.00/acre | | | | | 45.00 |
| Hauling | .25/cwt. @ | 300 lbs/acre | | | | .75 |
| Cleaning Seed | 5.00/cwt. | | | | | 15.00 |
| Bags | 1.00/cwt. | | | | | 3.00 |
| Alfalfa Seed Research Fee | .15/cwt. | | | | | .45 |
| TOTAL HARVEST COSTS | | | | | | 64.20 |
| TOTAL ALL COSTS | | | | | | 417.78 |

PROJECTED INCOME ABOVE COSTS (PER ACRE)
price/lb.

| | | .60 | .80 | 1.00 | 1.20 | 1.40 | 1.60 |
|--------|------|------|------|------|------|------|------|
| | 200 | -291 | -251 | -211 | -171 | -131 | -91 |
| Pounds | 400 | -184 | -104 | -24 | 56 | 136 | 216 |
| per | 600 | -77 | 43 | 163 | 283 | 403 | 523 |
| acre | 800 | 30 | 190 | 350 | 510 | 670 | 830 |
| | 1000 | 137 | 337 | 537 | 737 | 937 | 1137 |

ALFALFA SEED CULTURE

1991-1992

| <u>YEAR</u> | <u>ACRES</u> | <u>YIELD/ACRE (LBS.)</u> | <u>VALUE/LBS.</u> |
|-------------|--------------|--------------------------|-------------------|
| 1989 | 17,783 | 475 | \$1.35 |
| 1988 | 19,726 | 417 | 1.18 |
| 1987 | 19,961 | 456 | .90 |
| 1986 | 15,700 | 477 | .81 |
| 1985 | 16,600 | 368 | .83 |

STARTING DATES: The best possibility for a good seed crop occurs when the last hay is cut between May 1 and May 15, so that by June 1 to 15 the field is in full bloom. Seed crops made at this time of the year have the best chance of avoiding lygus, stink bugs, and alfalfa seed chalcid infestations which build up from early spring until late fall when the weather breaks. Later crops, maturing in August and September, may be damaged by rain. Earlier seed crops may not bloom properly due to cold weather, and seed "set" may be light or delayed.

VARIETIES: A number of non-dormant varieties both public and proprietary are grown in Imperial County. Any of these varieties may be grown for seed. The grower should follow seed market trends and demand in making the decision to grow a seed crop. Occasionally small acreages of dormant varieties will be grown by special arrangement if seed demand indicates good potential returns.

IRRIGATION: Allow the plants to become slightly stressed for water up until the bloom period to prevent rank growth; after bloom begins, the plants should be irrigated no more frequently than necessary to prevent wilting and to help produce well-filled seedpods. The flowers of a slightly stressed plant contain higher concentrations of nectar and are more attractive to bees.

POLLINATION: Bees are the only pollinators of any value on alfalfa. In Imperial County it is necessary to rely on commercial honey bees due to the lack of sufficient wild or commercial solitary bees available for pollen-collecting. At least three colonies of bees per acre are needed to produce high yielding fields. Five or more colonies are suggested on seed fields with both high plant and flower populations.

PEST CONTROL: Lygus control is necessary throughout the season. Stink bugs can cause damage to maturing seed and should be controlled. Seed chalcid is best managed by proper cultural practices as insecticides have not been cost effective. Consult your farm advisors for information on pests and their control.

HARVESTING: Most seed alfalfa is defoliated using spray compounds applied by airplane in 8 to 12 gallons of diesel oil per acre. Mowing and windrowing to dry seed for combining is also practiced.

BERMUDAGRASS SEED
PROJECTED PRODUCTION COSTS
1991-1992

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Mechanical operations at custom rates. Labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment insurance and fringe benefits).

Yield--650 pounds seed, double cropped, unhulled.

| OPERATION | CUSTOM RATE | MATERIALS | | HAND LABOR | | COSTS Per Acre |
|---|---|---------------------|--------|---|---------|-------------------|
| | | Type | Cost | Hours | Dollars | |
| LAND PREPARATION | | | | | | |
| Plow or Subsoil | 24.75 | | | | | 24.75 |
| Disc 2x | 9.50 | | | | | 19.00 |
| Build & Break borders | 15.00 | | | | | 15.00 |
| Flood | | Water .8 ac ft | 9.20 | 1 | 5.75 | 14.95 |
| Disc 2x | 9.50 | | | | | 19.00 |
| Fertilize | 8.00 | 75# NH3 @ .15/lb | 11.25 | | | 19.25 |
| Landplane 2x | 10.00 | | | | | 20.00 |
| TOTAL LAND PREPARATION COSTS | | | | | | 131.95 |
| COST OF ESTABLISHMENT | | | | | | |
| Plant (flat) | 12.00 | Seed 15# @ \$1.50/# | 22.50 | | | 34.50 |
| Sprinkler irrigate | | | | | | 120.00 |
| Irrigate 2x | | Water .8 ac ft | 9.20 | 1 | 5.75 | 14.95 |
| COST OF ESTABLISHMENT | | | | | | 169.45 |
| TOTAL COST OF STAND ESTABLISHMENT | | | | | | 301.40 |
| ANNUAL COSTS OF SEED PRODUCTION--5 YEAR LIFE | | | | | | |
| Irrigate 14x | | Water 5 ac ft | 57.50 | 5 | 46.00 | 103.50 |
| Fertilize (water-run) | | 350# N @ .15/lb | 52.50 | | | 52.50 |
| Insect Control 7x | 4.90 | Insecticide | 145.00 | | | 179.30 |
| Weed Control | 4.90 | Herbicides | 10.00 | | | 14.90 |
| TOTAL ANNUAL COSTS | | | | | | 350.20 |
| PREHARVEST COSTS | | | | | | |
| Land Rent (net acres) | | | | | | 160.00 |
| Amortization | 20% on total cost of stand establishment | | | | | 60.28 |
| Cost Overhead | 15% of annual costs, land rent and amortization | | | | | 85.57 |
| TOTAL PREHARVEST COSTS | | | | | | 656.05 |
| HARVEST COSTS | | | | | | |
| Swather 1x | 8.00/acre | | | | | 8.00 |
| Bale 2 tons | 12.00/ton | | | | | 24.00 |
| Haul & Stack | .24/bale @ | 15 bales/ton | | | | 8.64 |
| TOTAL HARVEST COST | | | | | | 40.64 |
| SEED HARVEST & POST HARVEST COSTS | | | | | | |
| Cut Rotary mower 2x | 15.00/acre | | | | | 30.00 |
| Combining 3x | 29.00/acre | | | | | 87.00 |
| Hauling | 5.00/ton | | | | | 2.25 |
| Cleaning Seed | 9.17/cwt | | | | | 82.53 |
| Bags | 1.00/cwt | | | | | 9.00 |
| Baling straw 3 tons | 12.00/ton | | | | | 36.00 |
| Rake 2x | 4.00 | | | | | 8.00 |
| Haul & Stack | .24/bale @ | 20 bales/ton | | | | 14.40 |
| TOTAL SEED HARVEST & POST HARVEST COSTS | | | | | | 269.18 |
| TOTAL ALL COSTS | | | | | | 925.23 |
| Value of pasturing and straw --- | 45.00 | | | Total: straw and pasture | | 45.00 |
| | | | | Seed costs: (total costs-straw & pasture value) | | 540.23 |
| | | | | Seed breakeven price/lb. @ 650 lb./acre | | 1.35 |

BERMUDAGRASS SEED CULTURE

1991-1992

| <u>YEAR</u> | <u>ACRES</u> | <u>YIELD/ACRE (LBS)^{1/}</u> | <u>VALUE/LB</u> |
|-------------|--------------|--------------------------------------|--------------------|
| 1989 | 18,561 | 575 | \$1.30 |
| 1988 | 20,160 | 540 | 1.25 |
| 1987 | 23,476 | 838 | .80 |
| 1986 | 20,800 | 939 | 1.60 ^{2/} |
| 1985 | 15,000 | 855 | 2.20 ^{2/} |

SOIL PREPARATION: A uniform seed bed is a prerequisite to a good stand. High spots in the field cause uneven irrigation, resulting in poor stands. Plowing or subsoiling appear to be equally satisfactory as initial soil tillage for bermudagrass.

PLANTING DATE: Late May to early June is the preferred time for plantings.

SEEDING RATES: Plant 5 to 15 pounds of seed per acre on either corrugations or flat basins. There are approximately 1,800,000 seeds per pound. This means there is potential for 205 plants per square foot with 5 pounds of seed per acre. Heavier seed rates are needed on saline soils. Corrugation cost is \$12 acre extra at planting.

VARIETIES: Two varieties are commonly grown for seed in Imperial County, Common and Giant, however, there may be other varieties grown as well. Varieties that are in demand in domestic and foreign markets should be planted if possible.

IRRIGATION: Tensiometers help to determine water needs and schedule better irrigation. Sprinklers should be used to establish the best stand possible. Call the farm advisors' office for further information.

PEST CONTROL: Good control of insects in the early part of crop growth is necessary and more important than later in the crop. Cutworms, spider mites, thrips and aphids may cause damage to spring and fall crops. Grass whiteflies and the fulgorid Toya propingua can cause extensive damage in the fall by contaminating seed heads with honeydew.

A large amount of hand labor may be needed if fields have offtypes and grassy weeds. Call the weed control farm advisor for further information.

HARVESTING: Most seed bermuda is harvested twice a year, a summer crop and a late fall crop. However, some crops may be used as pasture or harvested for hay depending on market demand and prices.

Hay can be harvested instead of one seed crop. Hay harvesting cost averages \$41/acre. Income from hay can be \$70/acre.

The harvesting costs presented here should be adjusted for seed/seed, seed/hay, pasture/seed or other harvest regimes for the summer/fall crops. Seed harvest cost \$135 per crop per year, while harvest for hay costs \$41 per crop.

^{1/} Unhulled seed

^{2/} price of hulled seed

CEREAL CROPS
PROJECTED PRODUCTION COSTS
1991-1992

Mechanical operations at custom rates. Labor at 5.75 per hour (\$4.50 plus Social Security, unemployment insurance and fringe benefits).

Yield--2.7 tons per acre. Days to maturity 90-170 days.

| OPERATION | CUSTOM | MATERIALS | | HAND LABOR | | COST |
|---|------------|-----------------|-------|------------|---------|---------------|
| | RATE | Type | Cost | Hours | Dollars | Per Acre |
| LAND PREPARATION | | | | | | |
| Stubble Disc 1x | 18.25 | | | | | 18.25 |
| Disc 2x | 9.50 | | | | | 19.00 |
| Fertilize (Injected) | 10.50 | 125# N @ .15/lb | 18.75 | | | 29.25 |
| List Borders-Block | 11.00 | | | | | 11.00 |
| Float | 8.25 | | | | | 8.25 |
| TOTAL LAND PREPARATION COSTS | | | | | | 85.75 |
| GROWING PERIOD | | | | | | |
| Plant | 10.00 | 125# Seed @ | 18.25 | | | 28.25 |
| Irrigate 5-7x | | 3 ac/ft | 34.50 | 2 | 11.50 | 46.00 |
| Fertilize 2x (water) | | 160# N @ .15/lb | 24.00 | | | 24.00 |
| Weed control | 5.25 | | 28.50 | | | 33.75 |
| TOTAL GROWING PERIOD COSTS | | | | | | 132.00 |
| GROWING PERIOD & LAND PREPARATION COSTS | | | | | | 217.75 |
| Land Rent (net acres) | | | | | | 125.00 |
| Cash Overhead-- 12% of preharvest costs & land rent | | | | | | 41.13 |
| TOTAL PREHARVEST COSTS | | | | | | 383.88 |
| HARVEST COSTS | | | | | | |
| Combine and haul | 2.7 tons @ | 12.00/ ton | | | | 32.40 |
| TOTAL ALL COSTS | | | | | | 416.28 |

PROJECTED INCOME ABOVE COSTS (PER ACRE)

| | | price/cwt | | | | | Breakeven |
|------|----|-----------|------|------|------|------|-----------|
| | | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | \$/cwt. |
| | 40 | -248 | -208 | -168 | -128 | -88 | 10.20 |
| cwt | 50 | -214 | -164 | -114 | -64 | -14 | 8.28 |
| per | 60 | -180 | -120 | -60 | 0 | 60 | 7.00 |
| acre | 70 | -146 | -76 | -6 | 64 | 134 | 6.08 |
| | 80 | -112 | -32 | 48 | 128 | 208 | 5.40 |

MULCH PLANTING: Costs that differ from above

| OPERATION | CUSTOM | MATERIALS | | HAND LABOR | | COST |
|--|--------|-----------|-------|------------|---------|---------------|
| | RATE | Type | Cost | Hours | Dollars | Per Acre |
| Preplant (mulch) irrigation | | .5 ac/ft | 5.75 | .33 | 1.90 | 7.65 |
| Harrow | 9.50 | | | | | |
| Subtract weed control costs | | | | | | -33.75 |
| Reduce irrigation to 2.5 ac/ft | | -.5 ac/ft | -5.75 | -.33 | -1.90 | -7.65 |
| TOTAL MULCH PLANT PREHARVEST COST | | | | | | -33.75 |
| TOTAL PREHARVEST COSTS | | | | | | 350.13 |

CEREAL CROPS CULTURE

1991-1992

WHEATYIELD/ACRE

| <u>YEAR</u> | <u>ACRES</u> | <u>(TONS)</u> | <u>VALUE/TON</u> |
|-------------|--------------|---------------|------------------|
| 1989 | 99,834 | 2.7 | \$126 |
| 1988 | 55,277 | 2.9 | 140 |
| 1987 | 68,249 | 2.6 | 109 |
| 1986 | 88,316 | 2.6 | 115 |
| 1985 | 108,740 | 3 | 122 |

LAND PREPARATION: When grains are planted in a mulch, the practice is disc, fertilize, disc and float. Next, apply the pre-mulch irrigation and when dry enough, mulch and plant.

PLANTING DATES, RATES AND DEPTH: Optimum planting dates for high grain yields of wheat are from December 1 through January 15. Rates of seeding range from 100-150 pounds per acre. Seed should not be planted deeper than 3-4 inches if planted in a mulch. If the crop is to be irrigated up, shallow planting of 1/2-1 inch is best.

VARIETIES: Recommended varieties of wheat include (common wheats) Yecora Rojo; (Durum wheats) Mexicali 75, Aldura, Yavaros, WB 881 and WB Turbo.

The latest barley tests indicate Sunbar 409, Prato, CM 72 and UC Signal produce the best yields.

FERTILIZATION: Imperial Valley soils usually contain sufficient phosphorus for grain production if phosphates have been applied to other crops in the rotation. In a wheat-sorghum rotation, phosphates should be applied to the wheat. Wheat generally needs added nitrogen at rates of 200-300 pounds per acre, depending on the previous crop. For good yield and quality of varieties with a tendency towards yellowberry (low percent hard vitreous kernels), nitrogen should be applied at a rate of 200-300 pounds per acre split into 3 applications -- at preplant, tillering, and boot stage.

IRRIGATION: Pre-mulch irrigations should be heavy. Subsequent irrigations should be sufficient to maintain good growth and avoid stress. Yield can increase with the last irrigation as late as the medium dough stage, but this late irrigation also increases the risk of shattering and lodging.

PEST CONTROL: Weeds should be controlled in wheat to increase yield and to reduce the weed population in following crops. Planting in a mulch can reduce canarygrass problems. Consult your farm advisor for herbicides that are available for use.

Aphids are the only insects that may cause serious damage to wheat. Powdery mildew can be a serious problem on barley. Contact your farm advisor for pesticides that can be used in Imperial Valley.

COTTON
PROJECTED PRODUCTION COSTS
1991-1992
=====

Mechanical operations at custom rates. Labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment and fringe benefits).

Yield- 1150 pounds lint per acre. (2.3 bales) Days to harvest 170 to 200+ days.

| OPERATION | CUSTOM | MATERIALS | | HAND LABOR | | COSTS |
|--|--------------|-----------------------------------|-------|------------|---------|----------------|
| | RATE | Type | Cost | Hours | Dollars | Per Acre |
| LAND PREPARATION | | | | | | |
| Disc 2x | 9.50 | | | | | 19.00 |
| Float | 8.25 | | | | | 8.25 |
| Laser plane | 8.75 | | | | | 8.75 |
| Border-cross check | 15.00 | | | | | 15.00 |
| List | 11.50 | | | | | 11.50 |
| Fertilize (injected) | 10.50 | 80# NH3 @ .15/lb | 12.00 | | | 22.50 |
| Irrigate | | 1/2 ac.ft. | 5.75 | 2 | 11.50 | 17.25 |
| Lilliston | 9.50 | | | | | 9.50 |
| TOTAL LAND PREPARATION COSTS | | | | | | 111.75 |
| GROWING PERIOD | | | | | | |
| Plant - Shape | 12.00 | Seed 20# @ .56/lb | 11.20 | | | 23.20 |
| Preemergence weed control | 8.50 | Herbicide | 37.00 | | | 45.50 |
| Cultivate 2x | 10.75 | | | | | 21.50 |
| Fertilize 2x | 10.50 | 150# N @ .15/lb | 22.50 | | | 43.50 |
| Hand thin - Weed | | | | 8 | 46.00 | 46.00 |
| Layby herbicide | 8.50 | Herbicide | 8.40 | | | 16.90 |
| Irrigate (Temik) | 10.00 | Water 4.5 ac/ft | 51.75 | 8 | 46.00 | 107.75 |
| Insect control 6x | 5.00 | Insecticide | 76.00 | | | 106.00 |
| PBW pheromone | 11.00 | PBW Rope | 34.78 | | | 45.78 |
| Preconditioner | 6.00 | Ethephon | 13.00 | | | 19.00 |
| Defoliate 2x | 6.00 | | 24.00 | | | 36.00 |
| Chop stalks | 10.00 | | | | | 10.00 |
| TOTAL GROWING PERIOD COSTS | | | | | | 521.13 |
| GROWING PERIOD & LAND PREPARATION COSTS | | | | | | 632.88 |
| PREHARVEST COSTS | | | | | | |
| Land Rent (net acres) | | | | | | 150.00 |
| Cash Overhead-- | | 12% preharvest cost and land rent | | | | 93.95 |
| TOTAL PREHARVEST COSTS | | | | | | 876.83 |
| HARVEST COSTS | | | | | | |
| Machine picking | 48.00/bale @ | 2.3 bales/acre | | | | 110.40 |
| Hauling | 10.00/bale @ | 2.3 bales/acre | | | | 23.00 |
| Ginning | 3.00/cwt sc | (minus seed costs) | | | | .00 |
| TOTAL HARVEST COSTS | | | | | | 133.40 |
| POST-HARVEST COSTS | | | | | | |
| Bale assessments | 7.25/bale @ | 2.3 bales/acre | | | | 16.68 |
| TOTAL ALL COSTS | | | | | | 1026.90 |

PROJECTED INCOME ABOVE COSTS (PER ACRE)

| | | price/lb lint | | | | | |
|-------------|------|---------------|------|------|------|------|---------------------|
| | | .65 | .70 | .75 | .80 | .85 | Breakeven \$/lb. |
| Pounds | 1000 | -357 | -307 | -257 | -207 | -157 | 1.01 |
| lint | 1250 | -227 | -165 | -102 | -40 | 23 | .83 |
| per | 1500 | -98 | -23 | 52 | 127 | 202 | .72 |
| acre | 1750 | 32 | 120 | 207 | 295 | 382 | .63 |
| (500#/bale) | 2000 | 162 | 262 | 362 | 462 | 562 | .57 |

COTTON CULTURE

| <u>YEAR</u> | <u>ACRES</u> | 1991-1992 | |
|-------------|--------------|---------------------------------|-----------------|
| | | <u>YIELDS/ACRE (IN LBS)</u> | <u>VALUE/LB</u> |
| 1989 | 12,967 | 1,165 | \$.70 |
| 1988 | 24,181 | 1,005 | .65 |
| 1987 | 19,313 | 1,200 | .73 |
| 1986 | 17,169 | 1,260 | 1.02 |
| 1985 | 23,276 | 1,355 | .75 |

LAND PREPARATION: Most cotton is grown on raised beds 30 or 40 inches wide. The crop is generally planted in a semi-mulch and irrigated up. Cotton can be grown on all types of soil in Imperial County.

PLANTING DATES AND RATES: Cotton yields are normally higher if planted in March to early April. Yields decrease when cotton is planted later in the season. A soil temperature of at least 60° F at a depth of 8 inches is desirable. Spacings within the row of 3 to 12 inches result in approximately the same yields.

VARIETIES: Delta Pine 61, Delta Pine 77 and Stoneville 825 have been successfully grown. Other varieties grown are Delta Pine 90, Delta Pine 80, and Delta Pine 20, and Pima 5-6.

FERTILIZATION: Two hundred fifty pounds of nitrogen per acre will produce a good crop on solid planted cotton. The applications should be made before planting, at thinning, and in June. Phosphate application is a common practice, although tests have failed to show a yield response. The total nitrogen and phosphate applied depends upon the previous crop. It is important to check the nutrient and water status of plants and soil in the latter part of the growing season. Drying soil and low nutrients make plants easier to defoliate and harvest.

IRRIGATION: Do not allow the plants to remain wilted for extended periods of time. The number of irrigations depend upon the season and the soil type.

PEST CONTROL: Several herbicides are now in common use both as preemergence and layby treatments. Consult your farm advisors' office for registered, adapted chemicals.

The pink bollworm, the cotton leaf perforator, tobacco budworm, and cotton bollworm are widespread and pose a serious threat to cotton production. Other insects such as spider mites, cutworms, lygus bugs, leafhoppers, and whitefly may require treatment. The presence of these insect pests results in increased costs for pest control since multiple applications are necessary to keep them in check. The insecticide costs included in this circular could be higher, depending upon the presence of these and other pests. Consult the farm advisors' office for latest information and recommendations. Pink bollworm has been greatly suppressed through a mandatory early termination program in the Imperial Valley. Use of Gossyplue pheromone as a mating disruption technique can be used in place of insecticides where overwintering adult pink bollworm moth emergence is low.

Seedling diseases can reduce cotton stands to the point where replanting may be necessary. The seedling disease problem frequently is more severe where cotton follows sugar beets or alfalfa. Cool soil temperatures may also increase disease. Fungicide seed treatments should be used for seedling disease control.

MISCELLANEOUS: If PIX and/or Prep are applied, add \$50 per acre, plus application.

ANNUAL RYEGRASS PASTURE
PROJECTED PRODUCTION COSTS
1991-1992

=====

Mechanical operations at custom rates. Labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment insurance and fringe benefits).

| OPERATION | CUSTOM RATE | MATERIALS | | HAND LABOR | | COSTS Per Acre | |
|--|----------------|--|-------|------------|---------|-------------------|-------|
| | | Type | Cost | Hours | Dollars | | |
| LAND PREPARATION | | | | | | | |
| Disc 2x | 9.50 | | | | | 19.00 | |
| Fertilize | 8.50 | 100 # NH3 @ .15/lb | 15.00 | | | 23.50 | |
| Border | 8.50 | | | | | 8.50 | |
| Float 2x | 8.25 | | | | | 16.50 | |
| TOTAL LAND PREPARATION | | | | | | 67.50 | |
| GROWING PERIOD | | | | | | | |
| Plant | 8.50 | 40# seed @ .20/lb | 8.00 | | | 16.50 | |
| Irrigate 1lx | | 3.5 ac/ft | 40.25 | 4 | 23.00 | 63.25 | |
| Fertilize (water run) | | 250# NH3 @ .15/lb | 37.50 | | | 37.50 | |
| TOTAL GROWING PERIOD | | | | | | 117.25 | |
| GROWING PERIOD & LAND PREPARATION COSTS | | | | | | 184.75 | |
| Land Rent (net acres) | | | | | | 100.00 | |
| Cash Overhead-- | | 12% of growing, land preparation & land rent | | | | | 34.17 |
| TOTAL COSTS | | | | | | 318.92 | |

COST PER CWT OF GAIN

Calculations below show the cost per cwt. of gain at various stocking rates and rates of gain, assuming a grazing period of 150 days.

| | Stocking Rate (steers per acre) | | | | | | | cwt. gain for 150 days |
|---------|-----------------------------------|-----|----|-----|----|-----|----|------------------------------|
| | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | |
| | 1.00 | 106 | 85 | 71 | 61 | 53 | 47 | |
| 1.10 | 97 | 77 | 64 | 55 | 48 | 43 | 39 | 1.65 |
| 1.20 | 89 | 71 | 59 | 51 | 44 | 39 | 35 | 1.8 |
| 1.30 | 82 | 65 | 55 | 47 | 41 | 36 | 33 | 1.95 |
| Average | 1.40 | 76 | 61 | 51 | 43 | 38 | 34 | 2.1 |
| daily | 1.50 | 71 | 57 | 47 | 40 | 35 | 31 | 2.25 |
| gain | 1.60 | 66 | 53 | 44 | 38 | 33 | 30 | 2.4 |
| 1.70 | 63 | 50 | 42 | 36 | 31 | 28 | 25 | 2.55 |
| 1.80 | 59 | 47 | 39 | 34 | 30 | 26 | 24 | 2.7 |
| 1.90 | 56 | 45 | 37 | 32 | 28 | 25 | 22 | 2.85 |
| 2.00 | 53 | 43 | 35 | 30 | 27 | 24 | 21 | 3 |

RYEGRASS PASTURE CULTURE

1991-1992

| <u>YEAR</u> | <u>ACRES</u> | <u>VALUE/UNIT^{A/}</u> |
|-------------|--------------|--------------------------------|
| 1989 | 8,205 | \$175 |
| 1988 | 7,369 | 225 |
| 1987 | 5,727 | 200 |
| 1986 | 3,200 | 200 |
| 1985 | 3,300 | 200 |

A/ Pastured five times

SOIL PREPARATION: A uniform seed bed is a prerequisite to a good stand. High or low spots in the field causes uneven irrigation, resulting in poor stands.

PLANTING RATES, DATES & VARIETIES: Plant from 20 to 40 pounds of annual ryegrass seed per acre. Heavier rates may be needed on saline soils. Ryegrass may be planted from mid-September through November. Early plantings in September are excellent if weather has cooled down. "Common" is normally a good yielding variety in the Imperial Valley, however, most annual ryegrass varieties can be grown. When in doubt, consult you local farm advisor.

FERTILIZERS: Ryegrass needs approximately 200 pounds of total nitrogen for optimum growth. Fifty to 100 pounds are applied preplant as ammonia, however, nitrogen carryover from previous crops will reduce early season requirements. Fifty pounds of nitrogen, as ammonium nitrate or ammonia, should be applied after pasturing or as petiole analysis dictates.

Excess nitrogen can cause nitrate poisoning in livestock, and is most likely to occur in rapidly growing plants, under cloudy, and cold weather. Regular tissue analysis can keep growers aware of nitrate levels.

Phosphate residues from previous crops are generally sufficient for proper ryegrass production.

IRRIGATION: Ryegrass usually thrives under moist soil conditions. Quick applications of irrigation water are sufficient unless leaching of salts is intended. Ryegrass needs about eleven irrigations during the growing period (September through April).

PEST CONTROL: Weed control is not normally necessary in ryegrass pasture; 2,4-D gives excellent control of broadleaf plants if weed control measures are needed.

PASTURING: It takes about 75 days under good conditions from planting to first pasturing of ryegrass.

Ryegrass is normally pastured on a 28 to 40 day cycle. Four fields are pastured on a 7 to 10 day schedule. Stocking rate on the overall acreage will range from 3 to 5 head per actual acre planted.

If only 1/4 of the overall acreage is pastured at one time, the stocking rate for that area would be 4 x 3-5 cattle per acre or 12-20 cattle per acre.

SUDANGRASS HAY
PROJECTED PRODUCTION COSTS
1991-1992

=====

Mechanical operations at custom rates. Labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment insurance and fringe benefits).

Yield--5.0 tons per acre.

| OPERATION | CUSTOM RATE | MATERIALS | | HAND LABOR | | COSTS Per Acre |
|---|----------------|-------------------------------------|-------|------------|---------|-------------------|
| | | Type | Cost | Hours | Dollars | |
| LAND PREPARATION | | | | | | |
| Disc 2x | 9.50 | | | | | 19.00 |
| Fertilize (Injected) | 10.50 | 100# NH3 @ .15/lb | 15.00 | | | 25.50 |
| Border | 8.50 | | | | | 8.50 |
| Float 2x | 8.25 | | | | | 16.50 |
| TOTAL LAND PREPARATION COSTS | | | | | | 69.50 |
| GROWING PERIOD | | | | | | |
| Plant | 8.50 | Seed 85# @ .60/lb | 51.00 | | | 59.50 |
| Irrigate 8x | | 3.5 ac/ft | 40.25 | 4 | 23.00 | 63.25 |
| Fertilize (water run) | | 100# NH3 @ .15/lb | 15.00 | | | 15.00 |
| TOTAL GROWING PERIOD COSTS | | | | | | 137.75 |
| GROWING PERIOD & LAND PREPARATION COSTS | | | | | | 207.25 |
| Land Rent (net acres) | | | | | | 130.00 |
| Cash Overhead-- | | 12% of preharvest costs & land rent | | | | 40.47 |
| TOTAL PREHARVEST COSTS | | | | | | 377.72 |
| HARVEST COSTS (calculated at 5 tons/acre and 2 cuttings) | | | | | | |
| Swather 2x | 10.00 | | | | | 20.00 |
| Crimper | 5.50 | | | | | 5.50 |
| Rake 2x | 5.00 | | | | | 10.00 |
| Bale (5.0 tons) | 12.00/ton | | | | | 60.00 |
| Haul & Stack | .25/bale @ | 20 bales/ton | | | | 25.00 |
| TOTAL HARVEST COSTS | | | | | | 120.50 |
| TOTAL ALL COSTS | | | | | | 498.22 |

PROJECTED INCOME ABOVE COSTS (PER ACRE)

| | | price/ton | | | | | | Breakeven |
|------|-----|-----------|------|------|------|------|------|-----------|
| | | 40 | 50 | 60 | 70 | 80 | 100 | \$/ton |
| | 3 | -339 | -309 | -279 | -249 | -219 | -159 | 143 |
| tons | 3.5 | -327 | -292 | -257 | -222 | -187 | -117 | 125 |
| per | 4 | -316 | -276 | -236 | -196 | -156 | -76 | 111 |
| acre | 4.5 | -304 | -259 | -214 | -169 | -124 | -34 | 101 |
| | 5 | -293 | -243 | -193 | -143 | -93 | 7 | 93 |

SUDANGRASS CULTURE

1991-1992

| <u>YEAR</u> | <u>ACRES</u> | <u>YIELD/ACRE (TONS)</u> | <u>VALUE/TON</u> |
|-------------|--------------|--------------------------|------------------|
| 1989 | 49,167 | 4.0 | \$85 |
| 1988 | 34,509 | 5.5 | 90 |
| 1987 | 24,914 | 6.8 | 70 |
| 1986 | 13,500 | 5 | 68 |
| 1985 | 15,200 | 5 | 65 |

SOIL PREPARATION: A uniform seed bed is necessary to obtain a good stand of sudangrass. High spots in the field cause uneven irrigation and poor stands result. Low spots in the field will "scald" out, decreasing the stand population and reducing yield.

PLANTING DATES, RATES & VARIETIES: Sudangrass should be planted at 20 to 40 pounds of seed per acre. Sudangrass may be planted from March to June with a drill or broadcaster.

The variety Piper has always performed well in Imperial Valley. There are also a number of commercial varieties available. Consult your farm advisor for more information.

FERTILIZATION: Apply 50 to 100 lbs. of nitrogen as NH_3 preplant. Eighty to 100 lbs. of nitrogen may be applied in the irrigation water if necessary after the first hay crop is cut.

IRRIGATION: Sudangrass requires high soil moisture but will scald out during the hot summer days if standing water is left on a field several hours during mid-day.

PEST CONTROL: Weed control is not normally necessary in sudangrass production. However, 2,4-D gives excellent control of broadleaf plants if required.

HARVESTING: Sudangrass may be harvested 2 to 5 times, between June and November. Pasturing may also be practiced.

SUGAR BEETS
PROJECTED PRODUCTION COSTS
1991-1992

Mechanical operations at custom rates. Labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment insurance and fringe benefits).

Yield--26.0 tons per acre.

| OPERATION | CUSTOM RATE | MATERIALS | | HAND LABOR | | COSTS Per Acre |
|--|--------------------|---|------------------|------------|---------|----------------|
| | | Type | Cost | Hours | Dollars | |
| LAND PREPARATION | | | | | | |
| Plow or Subsoil | 24.75 | | | | | 24.75 |
| Disc 2x | 9.50 | | | | | 19.00 |
| Build & Break borders | 15.00 | | | | | 15.00 |
| Flood | | Water .9 ac/ft | 10.35 | 1 | 5.75 | 16.10 |
| Disc 2x | 9.50 | | | | | 19.00 |
| Fertilize | 6.00 | 300# 11-52-0 .15/# | 45.00 | | | 51.00 |
| Float | 8.25 | | | | | 8.25 |
| List | 11.50 | | | | | 11.50 |
| TOTAL LAND PREPARATION COSTS | | | | | | 164.60 |
| GROWING PERIOD | | | | | | |
| Plant & Shape | 14.00 | Seed 4# @ 12.50/lb | 50.00 | 1 | 5.75 | 69.75 |
| Herbicide 2x | 8.00 | Herbicide | 22.00 | | | 38.00 |
| Thin | 28.75 | Machine (synchronous thinner) or handthin | | | | 28.75 |
| Cultivate 3x | 10.75 | | | | | 32.25 |
| Fertilize 2x | 10.00 | 160# NH3 @ .15/lb | 24.00 | | | 44.00 |
| Weed Control | | | | 11 | 63.25 | 63.25 |
| Insect Control 4x | 4.90 | Pesticide | 48.00 | | | 67.60 |
| Disease Control 2x | 4.90 | Fungicide | 18.00 | | | 27.80 |
| Irrigate 12x | | Water 5 ac ft | 57.50 | 8 | 46.00 | 103.50 |
| TOTAL GROWING PERIOD COSTS | | | | | | 624.90 |
| GROWING PERIOD & LAND PREPARATION COSTS | | | | | | 789.50 |
| Land Rent (net acres) | | | | | | 175.00 |
| Cash Overhead | | 12% of preharvest costs & land rent | | | | 115.74 |
| TOTAL PREHARVEST COSTS | | | | | | 1080.24 |
| HARVEST COSTS | | | | | | |
| Dig | 2.35 per clean ton | Yield | 26 tons per acre | | | 61.10 |
| Haul | 2.54 per clean ton | | | | | 66.04 |
| Railroad freight | 4.94 per clean ton | | | | | 128.44 |
| HARVEST AND FREIGHT COSTS | | | | | | 255.58 |
| TOTAL COSTS -includes growing, harvest, and freight | | | | | | 1335.82 |

PROJECTED INCOME ABOVE COSTS (PER ACRE)

| | | -----tons/acre----- | | | | | |
|-----------|----|---------------------|-------|-------|-------|-------|-------|
| | | 20 | 23 | 26 | 29 | 32 | 35 |
| price | 35 | -577 | -501 | -426 | -350 | -275 | -199 |
| per | 40 | -477 | -386 | -296 | -205 | -115 | -24 |
| ton | 45 | -377 | -271 | -166 | -60 | 45 | 151 |
| | 50 | -277 | -156 | -36 | 85 | 205 | 326 |
| | 55 | -177 | -41 | 94 | 230 | 365 | 501 |
| Breakeven | | 63.84 | 56.80 | 51.38 | 47.08 | 43.59 | 40.69 |

SUGAR BEETS CULTURE

1991-1992

| <u>YEAR</u> | <u>ACRES</u> | <u>YIELD/ACRE (TONS)</u> | <u>VALUE/TON</u> |
|-------------|--------------|--------------------------|------------------|
| 1989 | 26,873 | 26.4 | \$42 |
| 1988 | 37,669 | 24.2 | 38 |
| 1987 | 37,741 | 26.6 | 37 |
| 1986 | 33,200 | 25 | 37 |
| 1985 | 41,300 | 21 | 36 |

LAND PREPARATION: Pre-irrigation on flat ground rather than beds is less expensive, produces lower salinity and better soil condition in the planting bed. Most growers will subsoil and some will plow.

SEEDING RATE: Early plantings during extremely hot weather will require a higher seeding rate to achieve the proper stand. Planting when soil temperatures are high greatly increases the incidence of seed rot and seedling damping-off.

PLANTING DATES: The planting season begins August 20 and continues through October.

VARIETIES: The varieties resistant to infectious yellows virus should be planted. However, some attention should also be given to root rot resistance. New varieties with a higher degree of resistance to some diseases in the Imperial Valley are available. New varieties are being tested annually.

FERTILIZATION: Phosphate--broadcast before listing. Nitrogen--apply 1/3 of required amount with phosphate preplant, 1/3 at thinning and final 1/3 before mid-December. Late applications of nitrogen will reduce sugar percentage and purity. Ammonium nitrate is a good source of nitrogen for sugar beets.

IRRIGATION: Irrigation is by furrows. The crop is "irrigated up" initially and may require "watering back" within 4 or 5 days to get a stand. Never allow the crop to wilt or suffer from shortage of water. Ten to 20 irrigations may be required depending on soil type. Last irrigation should be applied at least 30 days prior to harvest.

PEST CONTROL: Pest populations vary from year to year and costs vary accordingly. A number of insects and diseases may be a problem during the growing season. Growers planting extremely early should exercise all caution against damage by inspecting fields often and carefully. Crickets, flea beetles and armyworms occur as seedling pests and are especially damaging in early plantings. From January to March the green peach aphid is a primary pest. Spider mites and leafhoppers occur as last season pests. Sweetpotato whitefly can be a pest as a vector of lettuce infectious yellows virus, but little can be done to control the problem. Avoid planting sugar beets near fall melons or cotton to reduce the effects of whiteflies as they migrate. Nematodes can be a problem. Nematode infested fields should be rotated to non host crops for several years. Growers should carefully clean all nematode infested machinery when moving between beet fields. Consult your farm advisor for registered chemicals for pest control.

Several weed control options exist, consult weed control farm advisor for current recommendations.

NOTE

This document was prepared during the latter part of 1990 during the middle east (Persian Gulf) crisis. At the time of publication oil prices had increased by 40-50%, and fuel prices were up by 50%.

We anticipate these price increases will be directly reflected in custom rate surcharges. They will also affect pesticide, fertilizer and plastics costs. However, the permanent percentage increase is not yet clear.

Therefore, all cost figures in the tables which are affected by the cost of oil will need to be adjusted upward to reflect petroleum price increases.

The Editor

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