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IOWA FARM SCIENCE

›wa State University of Science and Technology/Ames, Iowa

Following a month of variable March weather, we can now look forward to our traditional April showers. The scene on this month's cover isn't an Iowa one; Steve Perrin photographed it in Maine. Other than for its scenic beauty, however, we selected it because we thought the cloud formation might help to boost your interest in the article beginning on the opposite page.

in this issue

April Iowa Farm Science Reprints

(available about mid-month)

FS-907 What Does the Weatherman Mean?
FS-908 Yes, You Can Control Crabgrass!
FS-909 Your Estate—What Costs for Settlement?
FS-910 Output Management for Agriculture?

chat with the editors

It's still too early to be sure as this is written, but preliminary figures indicate that as many as 60,000 persons took an active part in "The Iowa Future Series" discussions. These were sponsored throughout the state by the Cooperative Extension Service during February and March.

With background material in the form of "fact sheets" provided by the Extension Service, discussion groups met locally in every Iowa county over a 4-week period. Each group met weekly to consider the facts and to discuss problems and issues -- ranging from world and national to state, county and community.

Volunteer local leaders organized and conducted the meetings after obtaining fact-sheet materials and other assistance from county extension staffs. The aim of the meetings wasn't to seek group agreement in any of the areas considered but to provide a framework of facts and to stimulate interest, thinking and free discussion.

Following each session, individual members of the groups recorded their opinions privately on the issues and problems they had discussed. These unsigned opinion records will be used at both the state and county levels to provide a reflection of the current opinion and thinking of those who took part in the discussions. We plan to have an article summarizing some of the results in a future issue.

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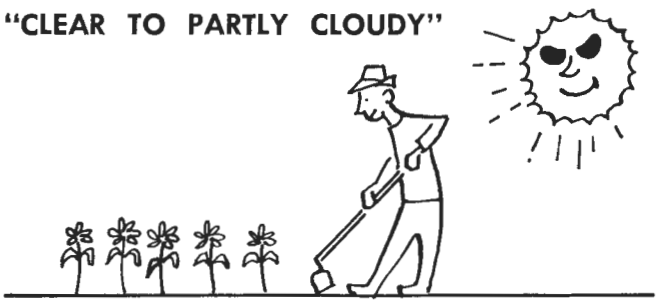
WHAT DOES THE WEATHERMAN MEAN?

The terms your weather forecaster uses have specific meanings. His forecast will be more meaningful to you if you know just what the terms mean.

by Dwayne A. Rohweder and Robert H. Shaw

"CLEAR TO PARTLY CLOUDY"



NO RAIN IN AREA

"SCATTERED SHOWERS"

30-45% OF AREA MAY GET RAIN

"RISK OF SHOWERS"

0-15% OF AREA MAY GET RAIN

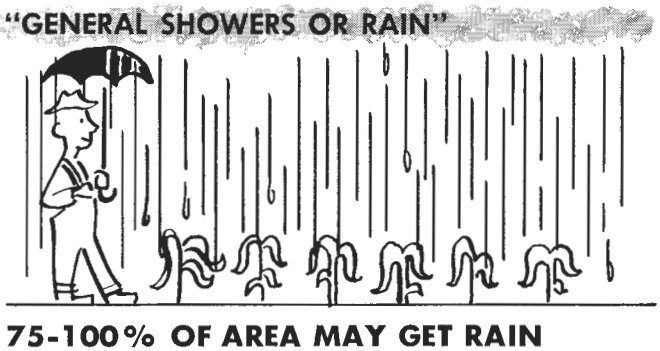
"SHOWERS"

45-75% OF AREA MAY GET RAIN

"WIDELY SCATTERED (or chance of) SHOWERS"

15-30% OF AREA MAY GET RAIN

"GENERAL SHOWERS OR RAIN"



75-100% OF AREA MAY GET RAIN

WHAT DOES the weatherman mean when he says there's a chance of showers today? This forecast has a definite meaning to him. But, unless you know what this meaning is, you may interpret his forecast differently. The weatherman uses particular terms in his forecast. He's familiar with these terms and intends to convey specific meanings. If you're not familiar with these terms or are uncertain of their meanings, less of his message "gets

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through," and it's, therefore, less meaningful and useful to you.

Suppose the weatherman forecasts showers for your area. This could mean several things to you. To the weather forecaster, it means that he foresees the development of the kind of cloudiness that results in local and temporary precipitation. A shower may develop over an area from 1-10 miles across, move across the country for several miles and then dissipate. Another shower may be developing some miles away.

This means that your particular location may: (1) receive a heavy shower; (2) receive only a light sprinkle of rain if it is at the edge of the storm; (3) be within view of the shower in the distance but receive no rain; or (4) be even farther than visual distance from the storm. In all four of these situations, the "shower" forecast was correct.

But the weatherman can be more specific than just saying "showers." The drawings show the meanings of what the forecaster intends to convey to you when he uses the more specific terms. These terms and meanings also are summarized for you in the table on this page.

Interpret these forecasts by considering the four situations that could exist for your particular location—(1) a heavy shower, (2) only a light sprinkle, (3) see the storm but receive no rain and (4) storm not within sighting distance. The greater the area expected to receive precipitation, the greater is your chance of receiving some of it.

Other Terms . . .

We've dealt mainly with showers in this article. There are, of course, many other forecasting terms used by the weatherman in the forecast you read, see or hear. Here are a few of the other terms and their meanings to help you know more exactly what the weatherman means:

Clear—Sky free or practically free of clouds; no more than 20 percent cloud covered.

Fair—No precipitation and less than 40 percent of sky covered by low clouds. (This term may also be used when the sun is shining through high, thin clouds.)

Partly Cloudy—30 to 70 percent of sky covered by clouds.

Cloudy—70 percent or more of sky covered by clouds of sufficient thickness to obscure the sun, moon or stars.

Overcast — Cloudy without breaks.

Variable Cloudiness—Indicates variation in the amount of clouds with respect to time or area. This term is used to show that cloudiness will increase or decrease several times during the forecast period.

Cold Wave — A temperature drop of at least 20° F. in a 24-hour period, falling to a minimum of 5° or lower in northern Iowa, 10° or lower in southern Iowa.

Snow Flurries—A snowfall of short duration, with clearing between occurrences; total accumulation of snow expected to be small.

Blizzard—A weather condition characterized by strong winds, snow-filled air (falling or blowing) and low temperatures.

Today—The forecast is for the period 6 a.m. to 6 p.m.

Tonight—The forecast is for the period 6 p.m. to 6 a.m.

Forecast terms and amount of area expected to receive measurable precipitation.

Forecast terms	Percent of area receiving measurable precipitation
Clear to partly cloudy, without mention of precipitation	0
Risk of showers	0-15
Widely scattered showers or chance of showers	15-30
Scattered showers	30-45
Showers	45-75
General showers (or rain)	75-100

For More Information:

A series of eight weather articles was published earlier in Iowa Farm Science. Reprints of these articles are available for your further interest and study. They are:

FS-743 What Is Weather?

FS-751 The Air We Live In

FS-757 How You and I Record the Weather

FS-758 Clouds—the Signposts of the Sky

FS-763 Why Our Weather Changes

FS-772 Iowa Weather Patterns

FS-776 How Weather Forecasts Are Made

FS-780 Our "Usual" Weather

Single copies of each are available free of charge through your county extension office or from the Publications Distribution Room, Morrill Hall, Iowa State University, Ames, Iowa.

Example Forecast: Northwest, Southwest — Showers this afternoon ending early tonight. Fair tomorrow. Cooler tonight and tomorrow.

Example Forecast for Several Districts: Northwest, Southeast, Central — Rain this afternoon. Showers and cooler tonight. Tomorrow fair and cooler except partly cloudy with scattered showers early morning near the Mississippi.

Yes, You Can Control Crabgrass

Common Smooth Crabgrass (Digitaria ischaemum)

by Eliot C. Roberts and Harold M. Pellett

IF YOU HAVE an average lawn, it may contain 10-12 crabgrass plants per square foot by midsummer. Besides spoiling the uniformity of an even-textured lawn, these clumps of coarse broad-leaved grass weaken permanent lawn grasses by competing with them for moisture and nutrients. If your lawn is heavily infested with crabgrass, this competition can result in a complete kill of large areas of bluegrass.

You can rid your lawn of crabgrass, however, through both cultural and chemical control. And two new chemicals, in particular, show considerable promise in preventing crabgrass seed germination and seedling establishment.

Crabgrass control falls into three general categories, which may be used singly or in combination: (1) cultural prevention of the conditions which favor the germination, growth and spread of crabgrass; (2) chemical control or prevention of crabgrass germination and establishment; and (3) chemical control of established crabgrass.

We'll look at each of these separately. But first, let's consider the nature of the pest we're seeking to eliminate.

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Crabgrass . . .

Three different types of crabgrass add to the weed population of lawn turf: Smooth Crabgrass *(Digitaria ischaemum)*, Hairy Crabgrass *(Digitaria sanguinalis)* and Silver Crabgrass or goose grass *(Eleusine indica)*. All three look much alike and are annuals. They develop from seed to mature plants that flower and seed by the latter part of August.

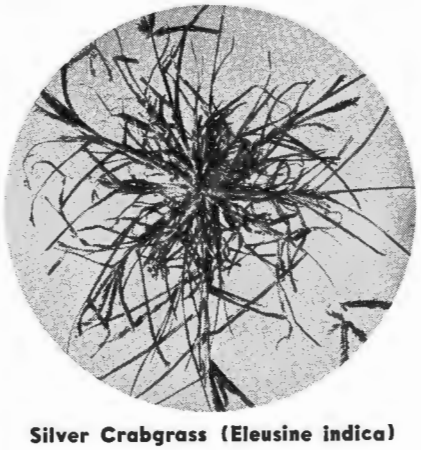
Seedling crabgrass emerges from the soil in a 2-leaf stage. The leaves are oval in shape and light green. As they develop, the plants become coarse and have spreading shoots that root at the joints and produce seed at the tips.

Crabgrass plants are killed by cold weather in the fall, but the seed lies on the soil surface over winter—to germinate and to produce a new weed crop in the spring. The earliest seed germination varies from late April to early June, germinating first where soils are warm and moist. In central Iowa, seedling plants normally appear in the last half of May—often coinciding with the period of blossom drop for the common or old fashioned purple lilac.

How It Spreads: Lawns which have been relatively free of crabgrass may suddenly become badly infested. Seeds may be carried in from neighboring property by foot traffic, by animals, by mowers or other lawn maintenance equipment, or by wind and water. Seeds often remain in the soil for more than a year if conditions for germination aren't favorable. Earthworms and insects may bring them to the surface.

To keep crabgrass from gaining a foothold in your lawn, remove as much seed as possible from the plants when mowing. Mow a little lower than usual in late August. Catch the clippings and seed, remove them from the lawn and burn them.

Good-quality lawn seed mixtures don't contain crabgrass seed. So you can be certain that crabgrass which develops in a new turf comes from seed already in the soil.



Silver Crabgrass (Eleusine indica)

Cultural Control: Crabgrass seeds may germinate over a long period of time in summer months. This makes control difficult. Moist soil conditions favor germination. Thus, frequently watered lawns are more likely to be infested with crabgrass than others.

Proper watering (less frequently but with large amounts of water), on the other hand, doesn't favor crabgrass germination at the soil surface.

Once the seedlings have taken hold, crabgrass thrives on hot, dry weather and plenty of sunshine—at times when the permanent lawn grasses usually are less vigorous. This makes it "easy" for the crabgrass to gain a foothold.

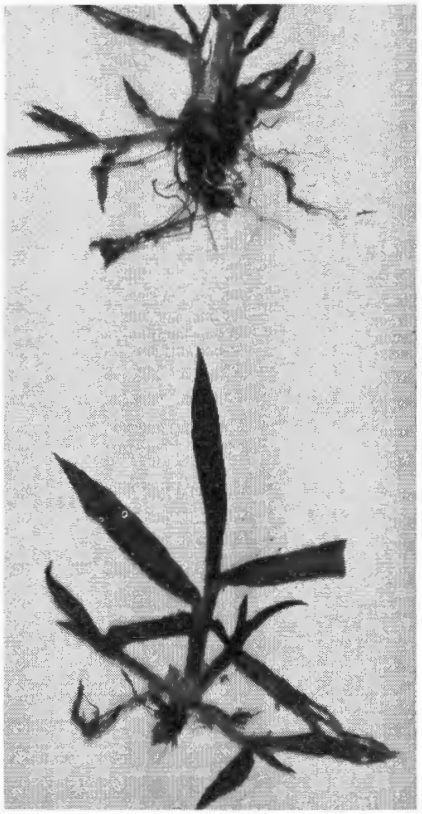
Crabgrass seldom is a serious pest in the shade. Because of this lack of shade tolerance, one of the most effective cultural control methods is to raise your mower to a 2-inch height of cut during May and June. Where your permanent grasses are dense, the additional shade retards the seedling establishment of crabgrass. Where your lawn is thin with much soil exposed, however, raising the clipping height won't be of much value. Also, if you have a poor and weedy lawn, late spring fertilization will often benefit crabgrass more than the permanent lawn grasses. This is because crabgrass has a faster rate of growth.

If your lawn is thick and growth is vigorous, late-spring fertilization helps to maintain this vigorous growth. In this case, crabgrass will be retarded by the shade and competition from the basic lawn grasses. Crabgrass doesn't need a fertile soil to become a serious lawn pest. Its growth and spread are slower on infertile soils but are just as inevitable unless you do something about it.

Chemical Control . . .

Established Crabgrass: Once you find crabgrass in your lawn, it isn't easy to kill chemically without injuring desirable lawn grasses. But the earlier you discover it, the better are your chances of obtaining complete control. Seedling plants are easier to kill than mature ones. But, at the same time, seedling crabgrass is harder to recognize than mature crabgrass.

For best results, it's essential to time chemical applications to treat crabgrass while it's still in the seedling stage. After crabgrass starts to seed, there's little value in trying to kill the plants; cold weather will do this for you, but the seeds for next year's crop have already formed. No chemical is available that will kill sufficient seed to make treatment at this stage worthwhile. Also, where lawns are watered throughout the summer, frequent chemical applications are necessary to kill new seedlings as they become established. No effective chemical control has been found for established Silver Crabgrass.



Young and seedling crabgrass looks much like a permanent lawn grass.

Our tests: We've used three chemicals in varying formulations by several manufacturers in tests on our own lawn plots. The active ingredients of these materials were P.M.A. (phenyl mercuric acetate), D. M. A. (disodium methyl arsonate) and A.M.A. (amine or ammonium methyl arsonate).

We recommend that P.M.A. *not* be used on *Merion* bluegrass. Other bluegrasses, however, are not injured by the proper use of this chemical. Carefully follow the manufacturer's directions on application rates. Frequency of application must closely follow the seedling development of crabgrass. Where seedlings get a good start, P.M.A. gives little control. If the lawn is frequently watered, treatments may be necessary as often as every 7-10 days.

D.M.A. and A.M.A. are much alike in effectiveness in controlling crabgrass. Application timing isn't as critical as for P.M.A. But these materials, too, aren't as effective on well-established plants as on young ones. Also, repeat applications are needed especially if the lawn is watered regularly.

Preventing Germination and Establishment: The most effective method of crabgrass control is to prevent seed germination and seedling establishment. This can be done by spreading a crabgrass preventer on your lawn early in the spring before seeds germinate.

The advantage of this method lies in eliminating the timing of chemical application as an important factor in the results obtained. Good results can be expected as long as the material is in the soil well ahead of germination and as long as it has enough residual or lasting effect to cover most of the summer.

A serious disadvantage is that some of the chemicals used may accumulate and remain concentrated in the soil for periods long enough to cause injury to the basic lawn grasses. Also, where your turf is thin, over-seeding with desirable grasses may be unsuccessful. This is because the chemicals used for crabgrass control to date

TABLE 1. Crabgrass control from chemical crabgrass preventers applied before seedling establishment, 1960.

Material	Av. No. crabgrass plants per sq. ft.	
	Location 1	Location 2
No treatment	17.8	7.8
Arsenic A	6.0	0.7
Arsenic B	6.0	0.5
Arsenic C	4.0	0.7
Chlordane	2.2	3.7
Dacthal	0.5	0.9
Zytron	0.0	0.5

Arsenic A, B and C, respectively, were Pax (manufactured by Pax Co. of Kelly-Western Seed), No Crab (produced by Amchem Products, Inc.) and Granular Calcium Arsenate (formulated by Allied Chemical Co.). Chlordane was Halts (formulated by O. M. Scott). Dacthal is manufactured by Diamond Alkali Co. and is being marketed by Swift and Co. as Rid and VitoGro Crabgrass Preventer. Zytron is manufactured by Dow Chemical Co. and will be marketed as Dow Crabgrass Killer.

show little selectivity between crabgrass seed and lawn grass seed.

Our tests: Tests at Iowa State over the past 2 years have shown several chemicals to be effective in preventing crabgrass seed germination and seedling establishment. These include various arsenic formulations (arsenate of lead, arsenous oxide, tricalcium arsenate), chlordane, Dacthal and Zytron. We applied several commercial products containing these to lawn turf according to manufacturers' directions. Statistical analysis of the results of these tests has led to the following conclusions (see table 1):

- All four materials—arsenic, chlordane, Dacthal and Zytron—resulted in significant reduction of crabgrass plants in comparison with nontreated plots. Where more than one crabgrass plant per square foot remained, however, we didn't consider crabgrass control as satisfactory.
- Dacthal and Zytron (granular formulations) resulted in better crabgrass control than chlordane or the materials containing arsenic. Dacthal and Zytron were equally effective in this regard. Results from the use of these two new chemicals were more consistent at different locations than the results from the other materials. An average of less than one crabgrass plant per square foot was left in treated areas, and this was considered to be satisfactory crabgrass control.
- Chlordane and the materials containing arsenic weren't consistent in performance. At one location, the arsenic compounds gave very poor control (leaving 4-6 crabgrass plants per square foot), while chlordane gave fair control (2.2 plants per square foot remaining). At another location, the arsenic materials left only 0.5-0.7 plants per square foot, while chlordane left 3.7. It's this inconsistency in performance that makes these chemicals less than ideal for crabgrass control. The inconsistencies are difficult to explain—differences in the complex soil environment from one location to another may be involved. But the trouble is that these inconsistencies may occur on home lawns just as in our plot tests.
- The compounds containing arsenic produced slight injury to bluegrass turf. Injury varied from discoloration of foliage to a slight burning and wilting of the plants early in the season. Chlordane, Dacthal and Zytron, however, resulted in no injury to lawn grasses at the rates used.

Residual effects: We checked on the residual effects of chlordane and arsenic-containing materials by observing the degree of crabgrass reinfestation the following year with no additional treatment. Less crabgrass came back into the plots previously treated with arsenic than in the plots that had been treated with chlordane. Both materials were about equally effective in controlling crabgrass in the year of treatment, but the arsenic residual was considerably more effective in the second year. The trouble in this case, however, is that the residual effect of arsenic is more likely than chlordane to cause injury to bluegrass and red fescue turfs.

When crabgrass plants mature, they form coarse clumps that can ruin bluegrass lawns by competing for moisture and nutrients.

Our Suggestions . . .

For best results in over-all crabgrass control, we suggest a combination of cultural and chemical control practices.

Cultural Control: (1) Fertilize your lawn in fall and early spring to encourage vigorous growth of lawn grasses. (2) Reseed thin spots in fall and early spring to assure a uniform coverage of lawn grasses. (3) Raise the cutting height to 2 inches from late April through early summer or for as long as crabgrass is germinating. (4) Don't water your lawn too frequently but soak it well when you do water; then let the *surface* dry out and remain dry as long as possible between waterings. (5) In late spring, apply lawn fertilizer only where the turf isn't thin and will respond by maintaining a thick, vigorous growth.

Chemical Control: Use one *or* the other of the following methods.

(1) Apply a chemical crabgrass preventer to your turf in March or early April. Carefully follow the manufacturer's directions. The active ingredients, Zytron and Dacthal, have given very good results in our tests; the arsenic formulations and chlordane have given fair to good, but inconsistent, results in our tests at Iowa State.

(2) Watch for crabgrass germination from late April through midsummer. Whenever you see crabgrass seedlings, make an application of P.M.A., D.M.A. or A.M.A. Use only one and apply it carefully according to the manufacturer's directions. Properly timed repeat applications are necessary for good control.

What Costs for Settlement ?

Besides tax costs, what other kinds of costs are involved in settling an estate? This fifth article in the series deals with these, how to anticipate them and also with the importance of financial liquidity of an estate.

by John F. Timmons and John C. O'Byrne

SOME OF THE costs of settling an estate can be anticipated and estimated fairly accurately. Others can be anticipated only in a general way. Yet, many of them must be *paid in cash* shortly after the death of the property owner. Expenses of the last illness, funeral and burial costs, outstanding debts and claims, taxes and the cost of administering the estate must be paid *before* any property transfer becomes fully effective.

Most people have some concern about these costs—particularly in minimizing them. But it's also important to *anticipate* and to *prepare for* costs that require cash settlement. Otherwise, it may not be possible to preserve and keep the real property of the estate intact if sufficient liquid assets aren't available during the estate settlement.

Once the value of the estate and the proposed distribution of it are known, the tax costs can be estimated or determined rather precisely. (See the previous article in this series, "What Taxes and How Much?" in the March issue or reprint FS-905.) The other costs can't be estimated so easily or accurately. The kinds of costs are fairly definite, but the amounts of the costs vary considerably.

You may, however, be interested in the general cost picture we found in a study in one of the state's predominantly agricultural counties. As part of a study of property transfer methods and plans, we examined the past probate records in this county for persons who died from 1948 to 1954. We found, in other words, the costs actually involved in settling these estates. From this, we can indicate at least a relative picture of the estate settlement costs at that time.

Court Costs are fees paid to the Clerk of the District Court for services performed by that office. In many instances, an appraisal of property is necessary to establish its value for inheritance tax purposes. The appraisal fees are part of the court costs.

Conflicts among heirs over distribution of property, sale of property to pay debts, partition actions to divide property and similar proceedings all increase court costs. Costs vary from estate to estate, depending on the work and services necessary in the settlement.

In the records analyzed, court costs tended to increase with the size of the estate. But, even within classes of estates of similar size, the range in costs was considerable. For estates with a gross value of under $40,000, for example, the average court cost was $63, but the range was from $12 to $163. For estates in the $40,000-$60,000 class, the average cost was $94, and the range was from $30 to $216. In the $60,000-$80,000 class, the average was $152; the range, $43-$174. For estates greater than $80,000, the average was $167; the range, $25-$292.

These figures illustrate the ranges of costs as we found them. The spread probably is greater and the average costs less than would be true at present; clerks' fees were increased in 1952, and the increase affected only a part of the estates for which records were analyzed.

Court costs usually are a very small part of the estate settlement costs. In this study, they averaged about 0.002 percent of the gross values of the estates.

Administrator, Executor Fees: The person who serves as the administrator or executor of an estate is entitled to a fee for his services. But he may be a relative of the deceased or a beneficiary of the estate and waive his fee. (Also, since the fees are taxable income, it may be to his advantage to take the amount as part of the estate if he is the only beneficiary. Sometimes, if he's one of several beneficiaries, the personal representative may hesitate to take a fee in addition to his share because of possible ill

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feeling among other beneficiaries.) Whatever the reason, fees had been waived in about two-thirds of the estates for which we examined the probate records.

The fees of the administrator or executor are fixed by law and must be approved by the court. The law authorizes the court to approve a reasonable fee of not more than the following percentages of the gross value of the estate listed on the probate inventory for Iowa inheritance tax purposes: 6 percent on the first $1,000, 4 percent on the next $4,000 and 2 percent on all amounts over $5,000. Sometimes there are unusual expenses or services—such as real estate and tax matters—that are considered beyond the scope of the regular compensation, and the court may allow additional compensation for these. On an estate of $100,000, ordinary fees of the administrator or executor would be $2,120.

Attorney Fees: The executor or administrator hires an attorney to handle the legal duties in administering an estate, and the attorney is paid from the funds of the estate. The attorney's fee follows the same statutory pattern as the fees of the executor or administrator.

Bond Costs: The administrator or executor must give a bond before undertaking his duties. This cost is paid from the estate. An executor may be freed by the will from giving bond, or, if individuals such as other heirs serve as surety on the bond, no cost need be incurred. Otherwise, the bond is secured by a professional guaranty or surety company for a fee. For the records we studied, bond costs were incurred in only 16 percent of the estates; costs ranged from $8 to $390.

The amount of the bond is set by the court. In one Iowa district, the bond is set at 1½ times the amount of the estate if with corporate surety or 2 times the amount if with an individual surety. Professional surety companies charge about $4 for each $1,000 up to $100,000. The rate is less on additional amounts.

Medical, Burial Costs: Unpaid expenses of the last illness and burial expenses represent preferred obligations of the estate. These costs, of course, vary tremendously among different estates. Of the past probate records we studied, the average cost was $1,150, and the range was from $350 to $3,000.

Other Costs: In the records of the estates studied, other direct costs of settlement were sometimes listed. Most of these represented costs of the sale of property and might very well be included under court costs. Abstract fees, revenue stamps, costs of a subsequent appraisal and general selling expenses are the normal additional costs.

All of these costs are *directly* related to the settlement of an estate and may, therefore, be properly regarded as the costs of transferring property at death. To include medical and burial expenses may seem a bit strained, but these are costs that arise only by reason of death and must be paid from the available property.

In addition to these direct costs of estate settlement, there are also taxes and debts. Debts are those incurred during life which are paid from the estate as the successor to the decedent. These aren't properly included as direct costs of estate settlement since they must be paid whether a person lives or dies. Taxes also usually are considered as a separate cost.

Why Anticipate?

Estate settlement costs generally require payments in cash rather shortly after death. In addition, federal estate taxes are due within 15 months after death, and Iowa inheritance taxes are due within 18 months after death. Also, many of the debts of the decedent will require a cash settlement.

Thus, it's important to estimate the probable liquidity—the availability of cash or readily convertible assets—of the estate. To estimate the probable need for liquidity, it's necessary to consider ordinary debts that may be due, prospective taxes and the kinds of direct estate settlement costs that we've listed in this article. The total of these offers a rough guide in forecasting the need for liquid assets.

The ordinary debts — loans, notes, bills, unpaid income taxes and the like—can be estimated with a good degree of accuracy for an individual family. Taxes also can be estimated with considerable accuracy (see previous article in this series). The direct estate settlement costs are more difficult to estimate because of difference among estates and because of the difficulties in foreseeing all of the factors that might affect these costs.

From our analysis of the probate records, we attempted to develop a formula that would have served for planning purposes to estimate the cash needs for the estates studied. We found that a reasonable estimate would have been about $1,194 *plus* about $4.46 for each $100 of gross value of the estate. This formula is simply one that would have worked to estimate the costs in the actual cases studied. Don't regard it as a formula for estimating probable costs with precision. Remember also that tax costs aren't included in this formula. Tax costs vary considerably but can be estimated as indicated in the previous article in this series or reprint, FS-905.

With its limitations in mind, however, the formula might be useful for at least rough planning purposes. The resulting figure could be adjusted upward in case of expected complications or downward, say, if there's good reason to believe that the executor would waive his fee.

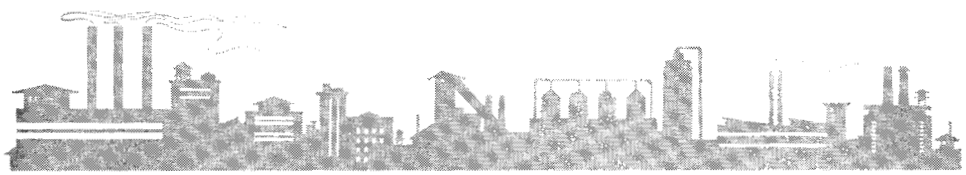
Why Important?

The importance of a liquid financial position for the estate and heirs at death of the owner was borne out by another part of the study in the same county. In addition to studying the probate records of 113 estate settlements, we interviewed 76 living land owners and examined their estates. We assumed that each land owner died on the day that he was interviewed.

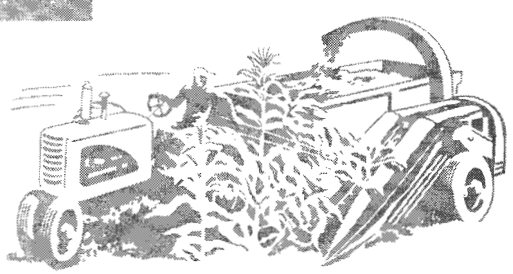
We found that 91 percent of the estates wouldn't have had sufficient liquid assets to pay estate settlement costs and taxes. If liquid assets held in joint tenancy and life insurance payable to named beneficiaries were used to pay costs and taxes, half of the estates still wouldn't have had enough liquid funds. These assets, however, don't pass to the executor or administrator; they could have been used only if the surviving joint tenant or life insurance beneficiary made them available.

Whether these people would allow such funds to be used to pay estate expenses might depend on the extent of their interests as beneficiaries in the rest of the estate. A surviving joint tenant can be compelled to pay his inheritance tax on joint-tenancy property, and the insurance beneficiary can be made to pay his share of the estate tax. Otherwise, they're not subject to compulsion except under very unusual circumstances.

In 12 percent of the situations analyzed, farm land would have had to be sold and converted into cash to pay costs and taxes. Remember, too, that debts have to be paid in addition to settlement costs and taxes. In the sample studied, about 40 percent of the cases had outstanding debts. Generally the failure of liquidity was complete in these cases. That is, the cases with insufficient liquidity to pay costs and taxes were also the ones with outstanding debts.



Output Management for Agriculture?



Could agriculture learn to manage its output from some other industries? Some industries have experience in managing excess capacity. Agriculture might want to look at the alternative methods and their consequences.

by Arnold Paulsen, Earl O. Heady and L. B. Fletcher

THE CORE of the commercial farm problem is surplus capacity. Over the last 30 years generally, the productivity of our land and of the resources used with it has increased tremendously.

When we use agriculture's full productive capacity for the conventional mix of crops, we now either produce surplus crops which must be stored or we market so much that farm prices and incomes are low. We've been doing both of these in recent years.

The same thing tends to happen in some other industries if they use their full productive capacity when demand is limited. But not all industries produce at maximum capacity. Some tend to fit their output to market conditions rather than to the capacity of their plants.

"Output Management"?

Our farm industry—now more than ever before—has a productive capacity greater than the quantity demanded at satisfactory prices. The industry must either face the consequences of full-capacity production or face a problem of "output management" just as do some other industries with short- or long-run excess capacity. Total farm output generally has been expanding, and individual producers market this production regardless of the price-depressing effects.

In contrast, price has been more constant in many nonfarm industries. The firms sell what they can at the price established. Their prices have been relatively stable. The large variation has been in

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output or the percent of capacity at which an industry operates.

The steel industry, for instance, ran at less than half of capacity during part of 1960. It frequently operates at 80-90 percent of capacity. A price for steel is established by leading producers in the industry—without the aid of a government regulating agency.

Producers offering steel at above the going price can sell little, if any. If a producer cuts the price below the going rate, others are likely to match the price, and the price cutter gains little, if any, new sales. As a result, he finds that the total dollar value of his sales is lowered. Also, he might expect various sorts of retaliation, such as price wars, from other producers. As a result, each producer sells what he can at the established price or makes only a few "quiet" concessions from established prices. He tries to produce just what he can sell at prices he will accept because any additional production goes into inventory to be held at a cost.

The petroleum industry, too, has had excess capacity and surplus inventories over the past several years. But it hasn't operated at full capacity and thrown its surplus on the market to take whatever price it could get. Crude oil production has been held below capacity for several years, and the low prices of "full capacity production" have been avoided.

To do this, the industry has enlisted the aid of federal and state regulating agencies. National demand for crude oil at the desired price is estimated a month ahead. In several major producing states, state agencies set "allowable production" for all producers each month. Production above this level is prevented to avoid waste of natural resources.

Once the allowable production is established, the price for each month is determined by the competition of buyers for the supply available. But because production has been brought forth to meet expected demand for the month, crude oil prices have been quite stable. If the demand is less than expected and prices weaken, the level of allowable production would be cut in the next month to restore prices.

Firms still compete vigorously with one another in these nonfarm industries. Each tries to produce more cheaply than his competitor so that he can make more money at the going price or sell at a lower price, if necessary, and still cover costs. Each firm tries to please the customer with a more desirable product to help gain a greater share of the market for the firm.

Neither of these two example industries go full-speed-ahead in production. In both cases, the adjustments to excess capacity situations usually are made in output—in relation to amounts that can be sold at established prices—rather than by maintaining output and letting prices adjust to full-production levels.

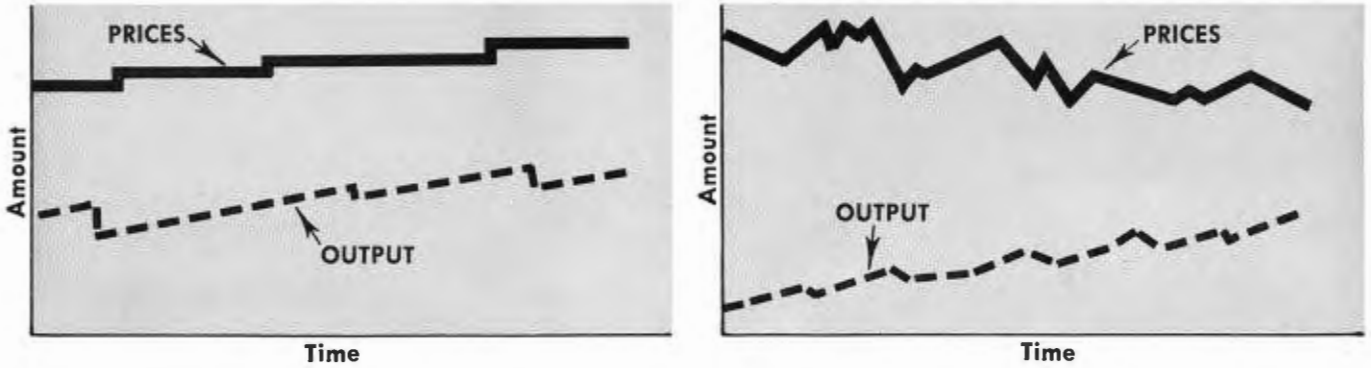
With What Result?

What are some of the results of variable output or less than full-capacity production? Don't be mistaken. There *is* some pain associated with managed output.

Profits of the steel and oil industries drop sharply when production falls below capacity. Thousands of workers also are laid off when output falls and, thus, are hurt by production control. Many would rather keep on working at a cut in wages rather than be laid off by shutting down a steel mill or by reducing the pumping rates of oil fields. But constant full-capacity production and accepting a lower price on a larger output and a lower return to labor and investment isn't permitted in industries where production is variable to keep prices more stable. Apparently the consequences of full-capacity production among these firms are more painful than is a reduced production.

What About Agriculture?

Could the agricultural industry adopt some sort of behavior to work along these lines in keeping output in line with demand? Interest is high in the possibilities of handling farm surplus capacity in a parallel fashion. In terms of American business traditions, many believe that agriculture should follow the lead of these other industries—with competition



Some nonfarm industries that have chronic problems of too much capacity, vary their output according to market conditions and manage to keep prices relatively stable (left). Farm output, on the other hand, has expanded almost constantly, and most of the variation has been in prices (right).

among producers in lowering costs, in improving products and in obtaining maximum market returns, but with output managed so as to achieve desired prices. Agriculture, in this way, would correspond more closely to other major industries.

Let's consider three broad types of output management possibilities for agriculture:

(1) Could agriculture manage its own output like the steel industry—with no government regulating agencies—and bring forth its output to meet demand at relatively stable prices?

(2) Could it manage output more like the oil industry—perhaps asking federal and state agencies to estimate demand for the coming year at desired prices and to distribute "allowable production" levels to all producers in each state and to prevent excess production for "conservation" purposes?

(3) Could a land-retirement program make it possible for the federal government to "buy up" the excess capacity that has been created—leaving the rest of agriculture free to operate on an open market and still achieve satisfactory prices?

Manage its own output? Some farmers are saying, "If we're to manage output, we'll have to do it ourselves, like the steel mills." Could agricultural producers band together into groups, decide on a price and sell only what they could at these prices? Could they, by persuasion or contract, prevent producers from selling for less than the agreed-upon price? Could they get producers to "inventory" or destroy excess production that couldn't be sold at the agreed-upon price? Could these producers stay together as friends and neighbors without resorting to retaliation and violence against a producer who flagrantly ignored the rules?

We don't know the answers to these questions. For it to work, a producer would have to give up some of his rights to make decisions about what and how much to produce. He'd have to let the group decide some of these things. He'd probably find this painful. But, like other industries, he might find the pain of output management to be less than the pain of full-capacity production. Some method of keeping "maverick" producers in line would be necessary. The courts might be used if the contracts were signed by producers. If not signed, would physical force, violence and fear of retaliation be the only means of enforcing compliance with group decisions?

Manage with just a little government help? Agriculture has millions of producers. It's very difficult for them to act together. Could agricultural producers, like the oil industry, enlist the aid of government? Could state or federal agencies estimate the demand for the next year at present or "fair" prices and then distribute "orders" for this output among producers? It seems that it would be possible to go this far.

There'd be some quarrel about what "fair" prices are, about how much should be sold at those prices and about how to distribute the demand among producers. Still, the estimates could be made and the demand distributed. Then, to obtain a "more stable price" and a "more variable output," producers would have to follow the allowable production levels given them.

Could producers be made to want to produce just this amount? Possibly, but no sure ways of doing it have been worked out. What's necessary is to make it attractive to produce the allowable amount but unattractive to produce more.

It would be necessary to have a zero price or a heavy penalty for production over the allowable amount. The price wouldn't be determined by government buying but by buyer competition for the total amount produced and sold. Producers would be free to dispose of their production at the most profitable time and place. Costs to the government would be only those for administration.

Manage excess capacity by land retirement? Before World War I, land placed a major physical limit on total agricultural production. All land was used. Full-capacity production sold at prices high enough to provide what was called the Golden Age of Agriculture. Now, with better production methods and added resources, it's just as though we'd added much more land. This suggests the possibility of buying up enough land to match this excess capacity.

Perhaps for the sake of higher price levels for farmers, the government could do this in the form of a land-retirement program. With enough land out of production, the excess capacity would be gone, and land would be reinstated as a major physical limit on production. Remaining producers could then go ahead and produce and sell in a constricted but open market.

Is it really this simple? Perhaps not. There'd be quarrels as to what are satisfactory prices and quarrels over how much excess capacity there is for satisfactory prices. There'd also be quarrels about where the excess capacity is and who has it, and there might be some trouble about buying up the excess capacity because it would cost a lot of money.

Summing Up: We can't say that there's any "best" way to put agriculture into the category of other industries with "prices more stable and output more variable." There are many questions to be answered. It's possible that output management could be achieved with no help, with a little or with a lot of help from the government. It wouldn't be painless. But it might be less painful for agriculture over time than accepting the consequences of a mounting full-capacity production.

For your Interest

horticulture

Bluegrass and Grama Best Orchard Covers

BLUEGRASS and side-oats grama are the most acceptable grasses, of those tested, for cover crops in the orchard, observes C. C. Doll, who directed the Experiment Station tests. Ratings of orchard cover crops 8 years after seeding show that bluegrass, bromegrass and orchardgrass are 100 percent established and spreading—followed by alta fescue and side-oats grama. Legumes that were seeded have less than a 50-percent survival rating after 8 years.

soils

Soil and Water Losses Measured

SOIL AND WATER losses from corn, oats and meadow have been measured on five Iowa soil types. Using these measurements, W. C. Moldenhauer and his Experiment Station and USDA coworkers hope to see how different rotation and tillage treatments influence losses. They also want to compare the amounts of erosion for the five soil types and see how rainstorms of different intensities affect these rates of erosion.

Nine storms caused soil and water losses on *Marshall silt loam* in 1959. Three occurred in May, three in June and three in August. Soil losses under continuous corn with high nitrogen fertilizer were lower than losses under rotation corn and under continuous corn with no nitrogen fertilizer. These lower soil losses under continuous corn with nitrogen fertilizer might be explained by the fact that between 2.5 and 3 tons of corn stalks are turned under every year, compared with a short stubble of alfalfa, brome or straw in the oats and meadow years of the rotation. The meadow yield preceding the 1959 corn crop was low (1.8 tons per acre) which also helps to account for the relatively higher soil and water losses from rotation corn.

Eleven storms caused soil and water losses on *Ida silt loam* in 1959—seven in May, two in August and two in October. No soil or water was lost from contour-listed plots, while 23 tons of soil per acre were lost under an up-and-down hill treatment, and 21 tons per acre were lost from a contour-surface-planted plot. In a very severe storm, the efficiency of contour surface planting, compared with the up-and-down hill treatment, is greatly reduced. During 1958 and 1959, a rotation with 2 years of meadow reduced soil loss during the corn year to one-third of that under a corn-oats rotation with the same type of tillage—contour surface planting.

Water losses from *Grundy silt loam* ranged from 1.23 to 3.92 inches in 1959. Soil losses ranged from 0.02 to 1.71 tons per acre. Lowest water losses were under

The amount of soil and water loss from cropland depends on a lot of different factors. Researchers at the Experiment Station are currently measuring the amount of loss under various tillage treatments.

first-year meadow in a corn-oats-meadow-meadow rotation and mulch tilled continuous corn. Highest water losses were under second-year corn in a corn-corn-oats-meadow rotation. Soil losses were low because the two largest storms occurred in August and September, and by then the corn crop had grown tall enough to protect the soil.

Both soil and water losses were low for *Seymour silt loam* and *Carrington silt loam* in the seasons studied. No measurable soil or water losses occurred under oats or meadow in the corn-corn-oats-meadow-meadow rotation for either soil.

Study Seepage From Western Iowa Reservoirs

THE RATE at which the water surface of western Iowa reservoirs dropped through 1959 was observed by H. P. Johnson and coworkers at the Experiment Station.

Reservoirs were treated with 0.1 or 0.2 pound of tetrasodium polyphosphate per square foot, or 2 pounds of bentonite per square foot. These treatments reduced the seepage rate considerably in the coarse loess soils of western Iowa. When the reservoirs are full (at inlet level), however, at least an inch a day is lost by seepage.

This reservoir—like most western Iowa reservoirs—probably loses about an inch of water a day through seepage. Agricultural engineers are testing various chemical treatments to reduce this seepage loss.

home and family

Study Nutrients Involved in Growth

THE DIFFERENCES in magnesium deficiency when diets containing either 20 percent or 30 percent casein protein are fed to laboratory test rats are under study at the Experiment Station. Male rats have shown more severe symptoms when magnesium deficient than have females. Later experiments will look for relationships between the nutrients, magnesium and protein.

Test Relationship of Protein to Carotene Use

HOW DOES the amount of nitrogen in the diet affect the use of carotene? Researchers measured carotene use by the amount of liver vitamin A stored. Up to a point, it seems that the amount of protein in the diet is directly related to the amount of liver vitamin A stored.

There are several steps involved in the use of carotene—absorption, conversion, transport and storage. Researchers are trying to learn what effect protein has on each step. They believe that there may be a connection between protein in the diet and the amount of carotene available for absorption. Laboratory experiments to test this relationship are being conducted under the direction of Lotte Arnrich of the Experment Station.

Values Held by Iowa Homemakers Tested

FOR ADULT educational programs to be of real benefit, it is important for teachers to know as much as possible of the values held by the people they wish to teach.

Methods by which to test what is important to Iowa homemakers are being developed at the Experiment Station by Mary S. Lyle, assisted by Jermaine Folkman. They will question married and unmarried junior and senior women at Iowa State to discover differences in values by class, marital status and college.

Study Deficiency of Vitamin E in Rats

IT'S BEGINNING to look as if a lack of vitamin E interferes not only with maintenance of pregnancy but also with normal delivery of young in the rat. Rats which were fed diets deficient in vitamin E from the first day of pregnancy delivered one litter but resorbed their second litter. Rats receiving the special diets from the time of weaning resorbed their first litters. Rats which were fed the special diet from weaning, then given a small dose of vitamin E both on the eighth and ninth days of pregnancy, frequently died about the time they were to deliver. Rats receiving the same diet plus regular doses of vitamin E delivered living young.

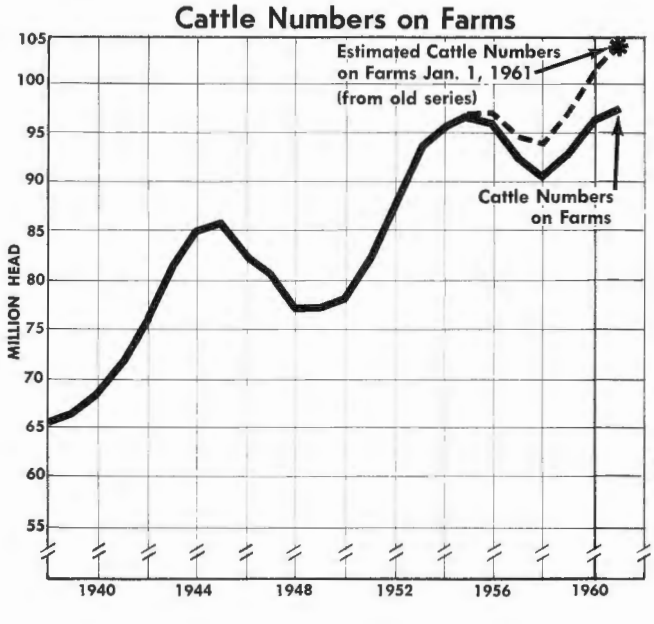
Graded doses of vitamin E fed early in pregnancy resulted in hemoglobin concentrations near the end of pregnancy that may be related to the dose of vitamin E. When washed red blood cells from the same animals were suspended in a solution containing dialuric acid, hemolysis was related to the amount of dietary vitamin E, also. Research is under the direction of Charlotte Roderuck and Pearl Swanson of the Experiment Station, assisted by Mary Crenshaw and Mary Alice Kenney.

Farm Outlook...

LAST FALL we indicated that prospects pointed to $1-$3 lower prices on fed cattle in 1961 -- that we seemed headed for a couple of years of declining cattle prices. These statements were based on an analysis of the then current national estimates of the number of cattle on farms, the rate of buildup in liveweight beef production and the rate of buildup in slaughter.

Analysis of the cattle cycle at that time showed that we were increasing numbers faster than slaughter -- but that slaughter was in the phase where it had started to catch up with liveweight production. The dotted line on the chart shows what the number of cattle on farms was estimated to be as based on the statistics then being used by the USDA. These indicated that we were facing an increase in slaughter of 3.5 million head of cattle and calves on the heels of a boost in slaughter of 3.1 million in 1960. This would have pushed slaughter close to 1955 levels.

But all was changed on Feb. 13. With one stroke of a pen, the USDA wiped out 5¼ million head of cattle. Instead of having 101.5 million head of cattle and calves on hand Jan. 1, 1960, the new estimates said that we had only 96.2 million. Thus, at the start of 1961, we had only 97.1 million head -- not the 104.5 million head expected by using the old series as a guide.



The revision in cattle numbers statistics means that last year's cattle slaughter was large enough to have left only about 900,000 head to add to inventories Jan. 1, 1961. We'll have about a 1-percent (around 400,000 head) larger calf crop raised this year than in 1960. If cattle numbers increased around 800,000 this year, this would leave us only about 500,000 to add to slaughter. Such an increase would be about enough to maintain the same supply of beef per person as in 1960.

We have an upward trend in the demand for beef. But consumer buying power probably has slumped a bit because of the current recession. Pork supply for the year as a whole will be about the same as last year -- less in the first half but more in the second half, and there'll be more chicken and turkey to compete.

All told, it probably means about the same average price as in 1960 for fed cattle over 1961 as a whole. This is in contrast to last year when the average price for choice cattle was down $1.65 from 1959. The main "if's" in this outlook are drouth, liquidation and/or a failure of business to come back in the last half of 1961.

This is a sharply different outlook for cattle than that indicated last fall at the time of the fall outlook and management meetings. The change is a direct result of the revision in the cattle numbers statistics which were re-

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vised on the basis of new information derived from the 1960 farm census.

For the intermediate outlook, the revised statistics portray a much improved prospect for stable cattle prices in the next few years; the earlier indications were for a further drop in cattle prices. In the light of the revised statistics, we're now at a stage where cattle slaughter can increase in the next few years at the same pace as population growth and the upward trend in demand for beef -- with liveweight production kept in step with this expanded slaughter. To do this, we'd have to avoid undue optimisms that would withhold cattle from market to build up inventories at too great a rate at one extreme, or a drouth-forced liquidation at the other.

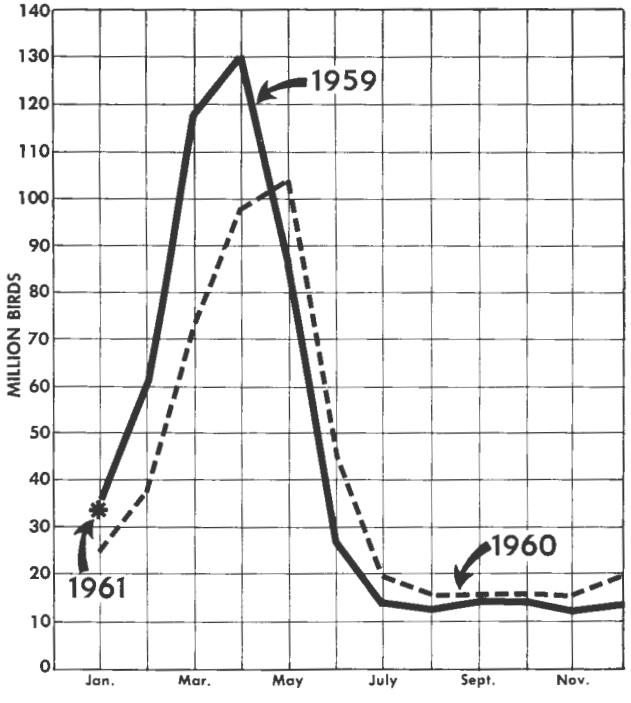
Right now, we're in a fairly stable position as far as cattle numbers are concerned. Slaughter is about in line with the current level of cattle numbers. If we can hold the increase in cattle numbers to around 750,000 to 800,000 for the next few years, the beef cow man should find a fairly stable market for his feeder cattle. This is a better picture than appeared to be the case 6 months ago.

EGGS . . .

Egg prices this past fall and winter have been well above the levels of recent years. This is the direct result of the sharp cutback in the number of chicks hatched last year. That cutback, in turn, was in response to the poor egg prices of last winter and spring.

But the hatch has been increased since late spring of 1960, and it's running

Monthly Hatchings of Replacement Type Chicks



ahead of last year's levels so far in 1961. This means there'll be more pullets added to laying flocks this coming fall and winter. And this means that egg production will be greater in the coming fall and winter than in the period we're in now.

Egg prices are highly sensitive to small changes in production. So we can expect, therefore, that egg prices a year from now won't be as good as they have been.

How much lower the prices will be will depend on how much the hatch is up during the current March-April-May period. These are the main hatching months. And there's enough question in the outlook to call for caution by egg producers in making production plans for the coming year.

-- Francis A. Kutish