MP-427
TEXAS AGRICULTURAL EXPERIMENT STATION-THE TEXAS A&M COLLEGE SYSTEM
R. D. Lewis, Director, College Station, Texas, March 21, 1960

SOME PROBLEMS IN THE ADJUSTMENT OF HAIL LOSSES IN COTTON

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Hail is one of the production hazards faced by High Plains farmers. The threat of a hail loss to the economic well being and livelihood of the individual grower always exists, and many farmers buy hail insurance to cover the risk. Many lending agents require that loans be protected with the purchase of hail insurance. Therefore, the matters of the accuracy of adjusting methods and the equity of the costs of insurance are of importance.

Estimating Hail Losses

Losses that result from hail damage depend on the effects of a number of biological and climatological factors. An equitable loss adjustment is possible only through the use of a standardized method of classifying the damages, followed by the application of proper "percentage loss" factors. Hail insurance companies have devised work-sheets and procedures for estimating losses.

The adjuster first determines the extent of damage in terms of stand reduction (or number of plants killed) and the number of plants cut off by making counts in several parts of a field. He then figures the percentage loss factors that apply to the kind and amount of damage found. These are based on the age of the cotton at the time of the storm since both stand loss and cut-off factors increase with the age of the crop. The factors also are interrelated because an increase in stand loss naturally reduces the percentage of stem cut-off loss.

The sum of all losses cannot exceed 100 percent. For example, if a crop is totally cut-off, the percentage loss factor applying (at a certain age) is 50 percent, but if the stand loss is 50 percent, the cut-off loss is 25 percent.

Historically, hail loss adjustments on the High Plains have been too high for storms before July 1, and too low afterward. It has not been possible to determine clearly the influence of the age of the cotton on this problem.

An excellent opportunity to analyze the effect of age on hail loss adjustments was provided by a severe hail at Substation No. 8 at Lubbock on June 22, 1959. Experimental plots used to determine the effect of date-of-planting on yield and quality were severely affected by this storm. Several plots of cotton of different ages--ranging from 6 to 62 days old--were damaged. All plantings were grown to maturity and the crop was harvested, although some of the younger stands were so damaged that it would have been impractical for a farmer to save them. The extent of damage and yields are summarized in Table 1. The expected yields are based on the average production for the specified planting date during the past 4 to 10 years. These results are shown graphically in Figure 1. The results for April 10 were adjusted because of limited observations. The real loss is the difference in percentage between the expected and actual yields.

The loss estimates as determined by the usual adjustment procedure are shown in column 9, Table 1. These estimates were made by using the stand reduction and cut-off factors, contained in booklet 6204 -- "Stand Reduction and Plant Injury Chart," prepared by the Hail Insurance Adjustment and Research Association.

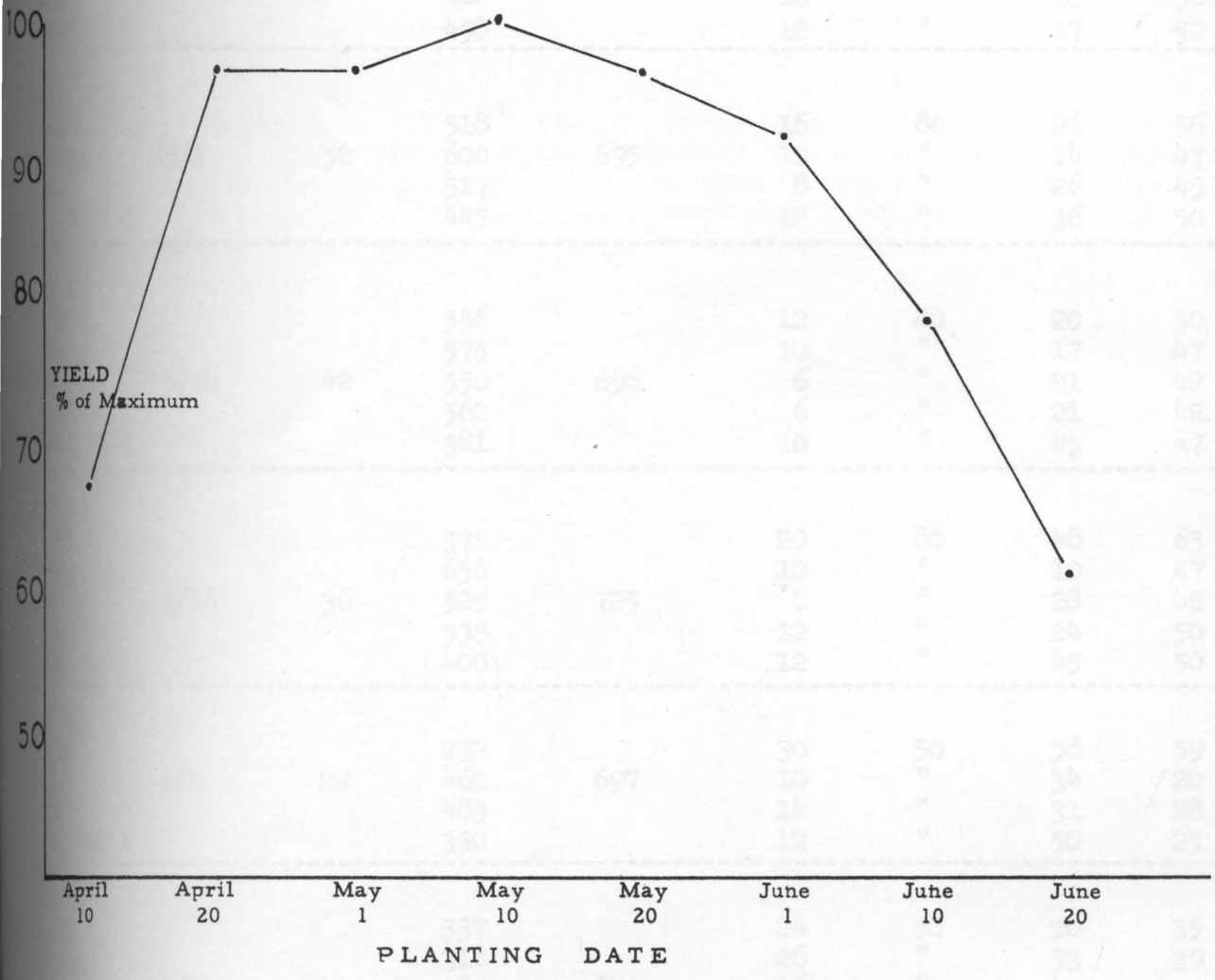

Figure 1. Results of planting cotton at different dates at Substation No. 8, Lubbock. These data, in part, are from unpublished Substation No. 8 annual reports and cooperative tests with cotton mechanization studies.

Table 1. Yields, damages and losses on hail-damaged cotton, Lubbock, 1959

Planting date[1]	Stand date	Age on June 22, days	Pounds of lint per acre: Yield	Pounds of lint per acre: Expected yield	Final spacing, inches	% cut-offs	Real loss, %	Estimated loss, %
April 10								
L-57			412		22	80	32	65
Gregg			550		8	"	8	45
BM	4/22	60	560	600	12	"	7	50
101			480		16	"	20	56
1517 BR-1			498		12	"	17	50
April 20								
L-57			518		16	80	26	56
Gregg	5/1	52	600	695	10	"	14	47
BM			517		8	"	26	45
1517 BR-1			445		12	"	36	50
May 1								
L-57			556		12	80	20	50
Gregg			575		10	"	17	47
BM	5/10	42	550	696	6	"	21	42
101			562		6	"	21	42
1517 BR-1			381		10	"	45	47
May 10								
L-57			375		20	80	48	63
Gregg			656		10	"	10	47
BM	5/16	36	525	725	8	"	28	45
101			535		12	"	24	50
1517 BR-1			400		12	"	45	50
May 20								
L-57			293		30	50	58	59
BM	6/1	22	462	697	10	"	34	20
101			483		14	"	31	28
1517 BR-1			350		12	"	50	23
June 1								
L-57			337		24	50	50	35
Gregg			318		26	"	53	39
BM	6/11	11	380	670	16	"	43	19
101			453		20	"	33	26
1517 BR-1			325		22	"	52	30
June 10								
L-57			375		12	None	34	3
Gregg			563		10	stems	1	2
BM	6/16	6	405	570	12	badly	29	3
101			440		20	bruised	23	16
1517 BR-1			330		16		42	8

1/ Varieties--Lankart 57, Gregg, Blightmaster, Paymaster 101, Acala 1517 BR-1.

The factors in Figure 1 vary according to the age of the cotton. The extent of damage also was estimated by a team of adjusters, and there was no appreciable difference in the application of the loss formulas.

A comparison between real and estimated losses in Table 1 shows that, in adjustments based on the age of the cottons, there is a strong tendency to over-estimate the actual loss on older cotton, and to under-estimate losses on younger cotton damaged in late June. The tendency toward a low estimate is not pronounced on varieties that are recommended for planting after June 1 (Gregg and Paymaster 101).

The problem confronting a hail adjuster, however, is to make the adjustment as near as possible to the actual loss. It is known that potential yields are lowered by very early planting, but remain essentially the same for a period during the optimum planting season. Thus it is reasonable to expect that a better fit between estimated and real losses would result if factors based on a common stand date, rather than age at the time of the storm, were used to calculate losses. Table 2, gives a comparison between the loss estimates based on age and a common stand date (May 20). The yields and damages in Table 1 were averaged to provide the comparison.

Table 2 shows that a more accurate adjustment is provided by factors based on an optimum stand date. The procedure reduces the estimate on older and increases it on younger cotton. It can be supported also because the peak period of growth comes after the hail period in June, and larger plants withstand and recover from a given amount of hail better than smaller ones.

Table 2. Average yield, loss and loss estimates

Planting date	Stand date	Age on June 22, days	Average yield, pounds of lint per acre		Real loss, %	Estimated loss based on	
			Actual	Expected		Age, %	Stand date, %
4/10	4/22	60	500	600	17	53	44
4/20	5/1	52	520	695	25	50	42
5/1	5/10	42	525	696	25	45	35
5/10	5/16	36	498	725	32	50	42
5/20	6/1	22	397	697	43	31	38
6/1	6/11	11	362	670	46	30	49
6/10	6/16	6	422	570	26	4	18

Cost of Hail Insurance in Texas

Hail insurance is available from the Federal Crop Insurance Corporation, a number of stock companies and two mutual companies in Texas. Both stock and mutual companies operate under Texas insurance laws and the regulations of the State Board of Insurance.

The Federal crop insurance policy for Lubbock county costs a grower $8.50 per $100. The liability is limited to $60 per acre, so that the cost is $5.10 per acre. Replanting of damaged crops under this policy depends on what most of the farmers in a community do after a storm. If an insured farmer replants to cotton as late as June 15, he does not collect. If, however, the farmer decides that it is too late to replant to cotton, liability is limited to $30 an acre as long as he

can plant another crop such as grain sorghum. Likewise, at lay-by (sometime in late July or early August), liability is only $48 in the event of a total loss by hail. If hail comes during harvest, the grower is guaranteed $60 gross per acre on the entire acreage. If a farmer with 100 acres of cotton, for example, loses 50 acres by hail, but produces enough cotton on the remaining 50 acres to average $60 per acre on the 100 acres, he does not receive a payment.

The Federal crop insurance plan is an attempt to protect only the farmer's investment. Needless to say, most farmers have to live next year, and this policy does not provide for losses in income. It is not adequate insurance after the time when a grower no longer can replant and make a salable crop.

The present stock company policy applies to each acre separately, and provides for a percentage payment on each damaged acre. For example, if hail destroys half of an acre, the farmer is paid a 50 percent loss on 1 acre. Although the various companies limit the amount of liability assumed on a section, a farmer usually can buy as much coverage as he desires. In Lubbock county, insurance costs $15 per $100, although the farmer can reduce this cost one-third to one-half by assuming 10 or 20 percent of the liability. Hail insurance costs vary by counties, and are based on loss experience in each county. The insurance sold by stock companies supplies adequate protection to income provided the buyer insures to the value of his crops. The most objectionable feature of this insurance is its cost.

Under the 1960 Texas policy, it appears that farmers whose cotton has been destroyed by hail after noon on June 5 will be entitled to a 100 percent loss payment, even though it is a common practice for farmers in several parts of the High Plains to plant or replant after that date regardless of causes. Planting date tests at the Lubbock station have shown that June 10 plantings produce within 75 percent of the average of May plantings. The "1959 Results of Agricultural Demonstrations in Hockley County -- Texas Agricultural Extension Service Cooperating with Hockley County Program Building Committee," show that plot yields from June 8 to 12 planting dates produced within 75 percent as much as the average of plots planted in April and May, thereby indicating the accuracy of the results at Lubbock.

Discussion

The problem of excessive cost of insurance is that it discourages the farmer, who gets hail infrequently, from buying insurance. In turn, the liability assumed by the company becomes more and more based on the experience in areas receiving hail frequently, and costs continue to spiral upward. Today insurance companies cannot get the spread or underwrite their business so as to reduce loss costs. Increasing rates for insurance have caused this problem, and there seems to be no quick way out.

The experience at the Lubbock station illustrates the problem. Most of the experimental cotton plots at the station were planted in early to mid-May as usual, the allotment of approximately 75 acres being planted. All of the young cotton was damaged by a severe sandstorm on June 5. It had hardly recovered from these injuries when an exceptionally destructive hail occurred on June 22. Approximately 34 acres of the original cotton was kept after the hail and 23 acres were replanted to cotton after the storm. The cotton was harvested from all the acreage by stripper after frost.

Fifty (500-pound) bales were produced on the 57 acres, the late planting producing approximately half a bale per acre. The average value of the cotton

based on government loan values was 26.59 cents per pound. Since SLM 31/32 is a reasonable grade and staple to be expected from stripper-harvested cotton in average years, the reduction in lint value due to the sand and hail amounted to about 3 cents per pound.

The average production at the station (on dryland plus irrigated) has been 500 pounds of lint per acre. Thus, on the 75 acres of cotton, the expected gross return from lint cotton was approximately $11,100 (75 x 500 x 29.55). The return from cotton in 1959 was approximately $6,650 (50 x 500 x 26.55). Thus, the monetary loss was about $4,450, although approximately $1,200 more cotton could have been produced had all of the acreage been replanted to cotton.

The loss in gross return can be broken down as follows:

(1) 25 bales x 500 lb. x 29.55¢ = $3,700 (loss in bales)
(2) 50 bales x 500 lb. x .03¢ = 750 (loss in grade)
$4,450.00

Although $120 gross value per acre of cotton were produced on the damaged and replanted crop combined, a company would have the following losses if the crop had been insured to value $148 per acre:

(1) 41 acres x 148 per acre = $6,068.00
(2) 34 acres at 50% loss ($74) = 2,516.00
Total = $8,584.00

It does not matter that farmers generally insure to less than value because the overpayment has the same percentage effect on insurance costs.

Several possible solutions to increasing costs have been considered. It is thought that ratings by townships might reduce the costs to low-experience areas, however, this would not solve all of the problems.

An agreement about the replanting of damaged crops that is more in line with what farmers actually do also will help with costs. Farmers in some parts of the High Plains do not hesitate to replant after hail storms around June 10, even though their cotton may not be damaged much. Unless companies continue to reduce losses at this time of the season in proportion to the actual loss, insurance costs will increase out of the range of many farmers. In Lamb county, insurance costs are now based on a rate of $21 per $100 of insurance, and could be expected to increase because of the hail experience in 1959, although the county produced 175,000 bales on 197,000 acres of dryland and irrigated cotton, about 25 to 30 percent being dryland.

The costs to a company other than hail losses take about 40 percent of the premium dollar. This cost takes care of agent fees, premium taxes, printing and adjusting costs and office overhead. There seems to be no way to reduce these costs under present prices and tax laws. The high cost of servicing hail insurance policies makes it all the more imperative that rates should stay in line with the real hail hazard in an area. It behooves the adjuster to try and make adjustments as near as possible to the actual loss. Farmers also are obliged to insist on accurate adjustments. No equity is possible unless each farmer has the opportunity to buy insurance at a price related to the actual risk.

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