

## THE RED-TOP PRODUCTION OF SOUTHEASTERN ILLINOIS

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On September 17, 1929, newspapers carried the following release from the Illinois Agricultural Association:

"The red-top growers of southeastern Illinois are the first farmers in the state to be granted direct aid by the federal farm board under the agricultural marketing act. Two cents a pound on red-top seed was to be advanced, in addition to the maximum of seven cents a pound obtained from the intermediate credit bank."<sup>1</sup>

"Thus the Egyptian Seed Growers' Association," continued the item, "is enabled to advance to grower members a maximum of nine cents a pound on their crop."

Geographers in general have had little contact with red-top production and would find small interest in the item just mentioned unless perchance the eye fell upon a further sentence:

"Over 90% of the red-top of the world is grown on approximately 7,000 farms in about seven counties of southeastern Illinois."

Such a localization of the world's production within the bounds of Illinois warrants an investigation of the geographical and other factors influencing this use of the seed as a crop.

Red-top is a meadow grass, tall enough when mature for mowing or binding, and forming sufficient foliage for use as hay. Botanically the plant is known as *Agrostis alba* or *Agrostis vulgaris*, there being but slight difference according to the United States Bureau of Plant Industry.<sup>2</sup> The grass is native to Europe and to North America. Thomas Shaw, the authority on grasses, names twenty-six as worthy of cultivation, nine of these being of major importance as farm crops. In order of importance red-top ranks fifth, being exceeded by timothy, Kentucky blue-grass, Bermuda grass, and orchard grass.<sup>3</sup> In New England it is a common practice to add red-top to timothy and clover mixtures for both hay and pasture.<sup>4</sup> In the irrigated areas of Colorado, Wyoming, and

<sup>1</sup>The Daily Pantagraph, Bloomington, Illinois, Sept. 17, 1929.

<sup>2</sup>U. S. Dept. Agric., Bureau of Plant Industry, Bul. 59, p. 36.

<sup>3</sup>Shaw, Thomas: Grasses and How to Grow Them. Webb, 1905.

<sup>4</sup>Farmers' Bulletin 990, Bureau Plant Industry, p. 7.

Montana, red-top is sown on irrigated meadows to supplement native grasses, and particularly to keep down sedges and rushes.<sup>5</sup> In Kansas the grass is combined with timothy as a grass for hay and pasture.<sup>6</sup> In Ohio red-top is a second to timothy as a grass for hay and to blue-grass for pasture, although not a close second to either. The grass is particularly adapted to growth for hay or pasture on soil too acid for timothy or clover, or on areas where the drainage is poor.<sup>7</sup> In southeastern Illinois, however, red-top plays a double role. It is a hay crop, in that it is found mixed with the timothy and clover in the meadows, and in that the threshed grass becomes a winter forage in the area. But the major role played is that of a money crop, for the grass is grown for its seed, thus entailing the problems of harvesting, threshing, and marketing as though it were grain.

The use of red-top seed as a money crop in southeastern Illinois is almost a matter of accident. Charles Shultz, the son of a German immigrant, returned to the area after the Civil War and started a general store in Olney, the county seat of Richland County, a village in the edge of the Illinois prairies. On his buying trip to New York, Mr. Shultz visited at the home of Henry Nungesser, another German immigrant, and a seedman by profession. Naturally Shultz was questioned about the seed problems of southeastern Illinois, and mentioned the native prairie grass which the farmers were using as a hay. Nungesser was at this time getting red-top seed from a small section of New Jersey and from Germany. Shultz saw a possible chance for added revenue in the Illinois grass, and in 1867 he flailed seed from the mown hay, cleaned it somewhat on a rotating reel-screen, and shipped it to his New York friend. Nungesser found the seed to equal the New Jersey product and that from Germany, and offered to buy. Shultz opened a local market at Olney, and was followed by two competitors. Three other buying-houses soon sprang up in the red-top area, at Rinard and Jeff in Wayne County, and at Salem in Marion County. The hard-pressed pioneer farmers of southeastern Illinois thus saw in this native grass of the prairie a chance for added revenue, a chance to use as a crop a grass which up to this time had menaced the quality of their timothy meadows by natural admixture, and they began to add it to the crop scheme of the area.

The characteristics of the red-top seed, however, set up an extremely difficult problem for those who would use it as a crop. The seed is markedly small, shaped like an oat-grain, and light in weight. The farmer, flailing out his mown red-top hay, and using a three-screen,

<sup>5</sup> Bulletin 12, U. S. Dept. Agriculture, p. 31.

<sup>6</sup> Bulletin 175, Kansas Agric. College, pp. 294-302.

<sup>7</sup> Bulletin 225, Ohio Agric. Exp. Sta., p. 158.

side-motion fanning-mill, could produce but a small quantity of seed, and add but little to the farm income. The threshing machine used for grains was tried, but the wind used to remove the chaff also removed the red-top seed, and the riddle system for screening the seed from the straw was found inadequate. In 1884, Jonathan Buzzard, a grist-miller immigrant from Ohio, who added wheat threshing as a part of his work, devised an auxiliary cleaner for handling red-top.<sup>8</sup> The fan of the threshing machine was shut off entirely, the cylinder slowed to 200 revolutions per minute, and the seed and chaff thus obtained with the wheat thresher was turned upon the auxiliary machine, called, with the Pennsylvania Dutch traditional lack of vocabulary, a "jinkey-fonkus." This auxiliary machine was a box-like affair some twelve feet long, four by four feet in cross-section, carrying two screens, or riddles, of 20 and 24 mesh, respectively, agitated by a crankshaft from the thresher. The apparatus was able to handle the seed and chaff when the bound hay was fed into the thresher in single bundles, thus affording the possibility of securing seed in large quantities and of marketable quality as to purity. Threshers used in the area today have an auxiliary cleaner built in, although the southwestern part of the area still uses the "jinkey-fonkus."

In 1896, Charles Shultz, visioning an increase in the red-top trade if his establishment could turn out seed 90% or above in purity, employed a Mr. Bishop of Kentucky, a man expert in the handling of blue-grass seed, to overhaul the Shultz cleaning machinery and devise a power cleaning establishment. After two months of trial and the expenditure of several thousand dollars in apparatus, the attempt was dubbed a failure.<sup>9</sup> Then Arthur E. Shultz, a son, who had caught his engineering vision at the University of Illinois, challenged his father for permission to rebuild the machinery and equipment, and shouldered the problem of cleaning the seed. He changed the speed of the machinery, the pitch of the screens, the power of the wind-chamber, and other details, and within two weeks' time the plant was cleaning one car of 30,000 pounds per day per man, whereas previously cleaning to 90% purity required the work of five men for one week to clean a carload of seed. As a result the secrets of construction were carefully guarded, the elevators were kept under lock and key with employees constantly on duty, and efforts to hire Shultz employees by rival seedsmen successfully thwarted. Today the Shultz Seed Company stands as the dominant figure in the world's supply of red-top seed, with Arthur E. Shultz as

<sup>8</sup> Interview with Martin Ridgely, Sumner, Illinois, R. F. D. 6.

<sup>9</sup> Interview with Arthur E. Shultz, Olney, Illinois.

the master-mind in the production, handling, and marketing, beyond doubt the world-authority in the use of this native prairie grass as a seed-crop.

The Shultz Seed Company plant at Olney, the largest in the area, and by far the most complete, has a value of \$100,000. The competing plant in Olney is valued at \$20,000. The two plants at Fairfield are valued at about \$20,000 each; the one at Salem at \$25,000; the one at Dieterich at \$40,000; and that of the co-operative group, the Egyptian Seed Growers' Association, at Flora at \$5,000; making a total cleaning-plant investment of approximately \$230,000 for the area.

At the time when Arthur Shultz organized the Shultz Seed Company, St. Louis and Chicago dealers were dominating the red-top trade. Realizing that local dealers desired to buy in other than carload lots, Shultz turned attention to marketing the seed as well as to cleaning it to the desired purity. As a result the Shultz Seed Company deals in red-top seed the year around, rather than a seasonal handling. Three locally trained experts travel continuously in the trade, one handling the eastern states, another the southern states, and a third the northern and western states. The "Put your home in a setting" movement, and the desire for the wide open spaces as afforded by the golf links, have created in the minds of the home-owner and the tired business man a demand for smooth green lawns and fairways with the greatest speed the landscape architects and the grass blades can attain. A red-top white-clover lawn can be had in six weeks, even in soil composed of materials from a basement excavation, while it requires almost three years for a good bluegrass sod under similar conditions. These uses of red-top seed as the chief constituent of lawn mixtures and golf-course grasses has more than trebled the demand for the seed. Four thousand local dealers are quoted prices on the seed each week during the market season from July 15th to March 1st by the Shultz Seed Company. Moreover, foreign seed-brokers in Hamburg, Stettin, Berlin, Leith, Paris, and London are given quotations on red-top seed laid down in their respective cities, packed in the weights and containers their local trade demands. Thus southeastern Illinois reverses the early trade situation, in that it exports to, rather than buys from, northwestern Europe.

The most important contribution of Mr. Arthur E. Shultz to the use of red-top seed as a crop is not the devising of machinery for its cleaning or the organizing of a superior sales machine, important and necessary as these two agencies appear to be. A still greater achievement lies in the work he has done to systematize red-top seed as a crop, to establish scientific grading of the seed so that producer may have fair

treatment from the buyer, and to find use for all of the material which the farmer offers in the trade as "seed." The present state and national seed laws are markedly strict as to purity of seed offered for sale and for importation, especially with reference to quarantine against noxious weeds.<sup>10</sup> Consequently the Shultz Seed Company have had the task of making their seeds equal in quality the ratings of the state, federal, and commercial testing agencies. This has meant continual refinement in the cleaning apparatus and in the care of the seed from the time it is purchased from the farmer until it reaches the consumer.

The average "raw" seed secured from the farmer grades as follows: fancy red-top seed 70%, unhulled red-top seed 5%, low-grade timothy and white clover 5-7%, sand 5-7%, and chaff and roughness 13-15%. "Standard" grade in the consuming market is 90% pure under government or commercial laboratory test, and 80% of all seed entering trade does so as standard grade. As high as 92, 94, 96, and even 98% pure grades are made up for special orders, particularly for golf-course trade, where the problem of adulterant weed seeds is a serious one. Grades of 85, 80, and 75% are handled for the cheaper trade. The unhulled red-top, the seeds to which the encasing hull is firmly attached, by reason of its resemblance to blue-grass seed, enters into blue-grass mixtures in order to reduce the cost in the retail trade. The low-grade timothy and white clover are recovered as individual seeds and enter the seed market as such. The bright chaff, with some of the light seeds, enters the trade of the five-and-ten stores as box mixtures of lawn seed, from which germination is as low in percentage as is the cost of the box mixture. The dark chaff and roughness enter the feed trade, being mixed with molasses, and become mule and oxen feed in the South, mainly in Arkansas. The sand is used locally as a lawn fertilizer, being given away for the hauling, and is much in demand. Thus scientific attention to utilizing the farmer's product attains an almost 100% achievement, veritably equalling the "all but the squeal" attainment of the Chicago meat-packing industry.

The area of red-top production in southeastern Illinois is shown on the map, the boundary line of production being an entirely arbitrary one. Wayne County stands out as the producer of the purest seed, and Richland County as the producer of the seed of highest quality. With the exception of the river bottom and swamp areas, the soil of this region is derived from the materials of the Lower Illinois glacial drift.<sup>11</sup> The surface material has thus been subjected to long weathering and

<sup>10</sup> Dept. of Agriculture, State of Illinois, Springfield, Bulletin 330.

<sup>11</sup> Hopkins, C. G.; Fertility in Illinois Soils. Bul. 123, Illinois Agricultural Exp. Sta. General Survey Map, p. 295.



ble is disced to secure a fine surface mulch, all that is needed as a seed-bed. Discing is preferred to plowing, because the greater looseness of the soil when plowed appears to increase the chances for heaving by frost and resultant winter-kill. The oat-stubble may possibly afford winter-cover as well. The lightness and size of the seeds demands special equipment for sowing. A long, light seed box with holes in the bottom and an agitator is fastened to a wheel-barrow or to the rear of a buggy, and a 16-foot swath is seeded. Four or five pounds of seed are applied per acre. No commercial fertilizer is added. All sowing, with traditional Pennsylvania Dutch surety, is done in the dark of the moon, the seed then rooting more deeply and being more drought resistant. The average life of a red-top meadow varies seemingly with the wetness and dryness of the seasons. Three to four years is the life as a rule, with six to eight years quite common, and with thirteen years as a locally known maximum.

Harvesting is with the ordinary wheat-oats binder, the grass being bound into bundles of similar dimension to these grains, thus utilizing the machinery already available in the area. The quality of the meadow is judged locally by the amount of twine needed to bind the hay; one pound of twine per acre is the average crop. Binding is preferred to mowing as a harvest practice, in that the seed when placed in bundles, shocked and thus cured in the field, dries out so that in threshing the outer coating or hull comes off readily, thus aiding materially the per cent of "silver hull" or clean seed secured through threshing. Binding also keeps the hay more free from dirt and moulds, produces "bright" or "clear" seed in contrast to "specky" seed from mowed hay and thus commands a higher initial price for the seed. The cost of threshing bound hay is usually 15 cents per bushel, while that of mown hay is from three to five cents more per bushel. In the use of the threshed hay for winter feeding, bound hay is much to be preferred to mown hay. Mown hay retains more of the seed in threshing, has been subjected to moisture and mildew, and often develops ergot, thus increasing the chances for abortion among the animals using it as feed. Harvesting red-top with the binder begins after both wheat and oats have been cut, thus releasing the use of the binder, and comes usually in the latter half of July and early August. It fits well into the task of plowing the corn for the last time.

Threshing of red-top comes after the first "run" of the wheat threshing and occurs as soon as the seed has been cured in the shock, generally in August and early September. The mown hay is usually put into small stacks at the place for desired threshing, but the bound hay is hauled directly from the meadow. Cotton bags for holding the

threshed seed are furnished to the farmer by the local seed dealer. These bags are of approximately 100 pounds capacity, and replace the larger "gunny sack," or jute bag, of earlier use. Formerly secured from New England cotton mills, most of the bags now come from North Carolina. Should the farmer not sell his seed to the dealer who has furnished him with bags, a standard price for settlement prevails. The farmer is not obligated absolutely to sell to the bag-furnishing dealer, although such is usually the case. The seed buyer bargains for the seed either by coming to the farm and sampling, or from the sample brought to the cleaning establishment by the farmer. Poor roads and slow transportation brought the dealer to the farmer in the earlier development of the seed as a crop. At first the dealer sampled the sacks of seed with a probe, blew on a sample thus secured to eradicate the chaff, and with his eye and experience in handling, made the farmer a price per pound for the seed. Such use of human ability led to much competitive bidding, generally leaving both farmer and dealer dissatisfied with the result. Here again the Shultz Seed Company is to be credited for advancement. By means of a small fanning mill, similar in function to those of the cleaning establishment, in size capable of being hauled in a road-wagon or buggy, a measured quantity of seed (four ounces in present practice) was sent through the cleaner as the farmer watched, and the resulting clean (90%) seed weighed before his watchful eyes on a scale calibrated in per cent. Thus the farmer was shown visually the actual value of his seed to the buyer, and he was quoted the proper per cent of the market price per pound. The average production of red-top seed is from 70 to 75 pounds per acre from a good meadow, which with a fair price, yields about nine to ten dollars gross per acre. Such a return was the \$9.80 gross of 1929.

The annual price for red-top seed is determined largely by the local dealer. Foresight of experience, size and disposal of the preceding crop, the apparent condition of the meadows, and the pulse of the market as determined by the field men, are influential in setting the opening price per pound. The shift of prices at the opening of the market in mid-August was from 7½ cents per pound in 1893 to 14 cents in 1929, with a minimum of 5½ cents in 1904 and a maximum of 22 cents in 1913, 1914, and 1926, although the extreme maximum price was obtained at the close of 1925 when 31 cents per pound was paid.<sup>12</sup> Three times since 1893 has the market opened high and then dropped in price, 1897, 1901, and 1917. Five times the opening price has been increased before the season ended, 1908, 1915, 1918, 1925, and 1928. See Table I. Since

<sup>12</sup> Price data from files of Shultz Seed Company, Olney, Illinois.

red-top seed forms the ready money crop of the area it markets quickly. More than 80% of the crop is sold by October 1st, and 90% by October 15th.

The production of seed in the area varies greatly. The average crop is between 200 and 250 cars of 30,000 pounds each.<sup>13</sup> The year 1927 is known as the "miracle" year, for the crop then totalled 700 cars, and it was followed in 1928 by a production of 475 cars. See Table II. Seedsmen in the area explain the 1927 production as "just a miracle." However, in 1925 when the price soared to 31 cents per pound, added acreage was put into red-top along the western side of the Illinois area, in

TABLE I  
ANNUAL PRICE OF RED-TOP

(First price indicates opening and second price close of market season.)

Year	Cents per pound	Year	Cents per pound	Year	Cents per pound
1893.....	7½	1906.....	8	1919.....	14—18
1894.....	12½	1907.....	8½	1920.....	14
1895.....	15	1908.....	12—14	1921.....	15½
1896.....	15	1909.....	10	1922.....	17
1897.....	13—9	1910.....	15	1923.....	14
1898.....	8½	1911.....	17	1924.....	13½
1899.....	8½	1912.....	10	1925.....	20—31
1900.....	8½	1913.....	22	1926.....	22
1901.....	11—9	1914.....	22	1927.....	10—11
1902.....	6½	1915.....	10—11	1928.....	12—14
1903.....	6	1916.....	9½	1929.....	14
1904.....	5½	1917.....	13—10		
1905.....	7	1918.....	12—14		

the southern tier of counties in Iowa, in the region adjacent to Mexico, Missouri, and in that about Owensboro, Kentucky. Probably these meadows did not reach their prime production until the years 1927 and 1928, and the two high yields can be thus explained.

The income from red-top in southeastern Illinois is gradually increasing. The 1907 crop brought approximately \$637,500; that of 1910 increased the revenue to \$787,500; that of 1915 went to \$866,250. The crop of 1920 at 14 cents per pound totalled approximately \$840,000; that of 1925, with the price ranging from 20 to 31 cents, brought approximately \$1,530,000; with the miracle year of 1927 estimated as selling for \$2,205,000.

<sup>13</sup> Production estimates from files of Shultz Seed Company.

The golf trade now absorbs about 15% of the crop, sales in carload lots about 50%, less than carload lots 30%, and the remaining 5% goes to replenish the local meadow acreage.

The use of the red-top stubble, after the cured bundles are removed for threshing, has much to do with the yield the succeeding year, and fits economically into the plans of the farmer. This stubble should become the pasture for the late summer, autumn, and winter, and it should afford grazing until the early thaws of February. Such grazing takes out the weeds from among the stubble and, through the agency of the animal hoof, cuts the rather tough sods, thus permitting the animal manures to penetrate more easily. Farmers often rent this pasture to

TABLE II  
ANNUAL PRODUCTION OF RED-TOP  
(Estimated by Arthur E. Shultz.)

Year	Carloads <sup>1</sup>	Year	Carloads <sup>1</sup>	Year	Carloads <sup>1</sup>
1907.....	250	1915.....	275	1923.....	375
1908.....	185	1916.....	225	1924.....	350
1909.....	240	1917.....	200	1925.....	200
1910.....	175	1918.....	225	1926.....	275
1911.....	160	1919.....	210	1927.....	700
1912.....	200	1920.....	195	1928.....	275
1913.....	150	1921.....	180	1929.....	200
1914.....	200	1922.....	325		

<sup>1</sup> One carload equals 30,000 pounds.

stock-men who desire to hold cattle locally for a period, thus adding to the gross return from the red-top acreage. Within the local area baled red-top hay, if harvested by binding, commands a price of from five to eight dollars per ton.

Thus red-top as a seed crop has won a place in the farm economics of southeastern Illinois. It is the ready-money crop of the late summer and the early autumn, and because it is produced from meadows it brings in almost clear revenue, except for the costs of harvesting and threshing. It thus affords to the farmer operating on a small margin, a source of income that has much to do with the general prosperity of the region. In fact, the flow of money in the area is directly proportionate to the amount and quality of the red-top crop, and local trade is thereby affected markedly.

This close relation to farm economics has, in the present agricultural crisis, turned the attention of the growers to co-operative marketing as a possible means of increasing the general revenue. The Egyptian Seed Growers Association was organized in 1923-24 through the Illinois Agricultural Association as a pool by which red-top seed could be marketed with greater profit to the grower. However, the skill in cleaning and marketing lies in the persons of the regional dealers, and this skill is the factor most largely responsible for successful handling. The co-operative group have based their argument for organization on the premise that the seed-man pays the farmer for "only the per cent of first-class seed which his sample tests," and "takes all the rest" of the poundage sold without remunerating the grower. Out of this "other material" comes the unhulled, the timothy, the white clover, etc., all of which have some market value. However, the work of the co-operative group so far has not shown that "the rest of the material" pays for the cost of handling. In 1927 the co-op group set the opening price at 18 cents per pound, endeavored to keep the standard this high, and sold their seed at 11 cents per pound, a loss of \$2,100 per car. The cost-burden of marketing a bushel (14 pounds) of 90% grade in 1927 by the co-operative group was \$1.91, while the average cost to the seeds-men was 93 cents. At present, (winter 1929-30) there is a strong move to extend organization so as to control the majority of the annual production. Little more than 10% of the production has as yet been in the organized pool. The lure of federal aid may increase the membership, yet the friendly attitude of the grower to seeds-men of established reputation will continue to be a handicap to co-operative organization.

There is little chance of expansion in red-top production in southeastern Illinois. The present market is about at the saturation point. Better cultural methods, the introduction of sheep as the pasturing agency, and the closer supervision of the tenant-farmer grower, in order to increase yield per acre, are the most pressing needs.