Southern Weed Conference
Fifth Proceedings
1952

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February 6, 7, 8, 1952

1952's CHALLENGE TO AGRICULTURAL RESEARCH

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Agricultural Research Administration
U. S. Department of Agriculture

You who are on the front line of research are well aware that American agriculture this year is facing a great challenge. You know the job that has to be done, and you've already laid the groundwork for it.

You know, too, that farmers have learned to depend on research. They are looking to your laboratories and field plots for the proved findings that make it possible to meet the goals of the future, just as your work in the past makes it possible to meet the goals of 1952.

The current goals in terms of bushels and pounds of agricultural products have been well publicized. They mean -- if they are to be met -- that we must produce 15 percent more corn this year than in 1951; 29 percent more grain sorghum; 5 percent more cotton; 18 percent more wheat; 12 percent more flaxseed, and so on. We need to set new records in livestock production. In total, the quantities of food, feed, and fiber needed make it necessary for farmers this year to produce more than has ever before been produced in any one year.

Stated this way, it sounds like other challenges our farmers have heard, and met, in the past. But their very success in World War II and the uneasy years following has created a still greater challenge for agricultural research. It is this challenge I want to explore with you today.

If we look back, we see how farm production since 1940 has toppled one record after another. Crop yields per acre in the last 12 years have shot up. Production reached a peak in 1948 ans has remained near that peak ever since. Last year's total was the third highest on record. And it was done on a smaller harvested acreage than in any of the last 9 years.

This was possible because of high yields per acre -- the second highest on record in spite of some bad weather and a drop in the number of farm workers. Research helped to make this possible. You who are engaged in research can take justifiable pride in the fact that your work has helped so conspicuously to make the American farm productive.

Technology and research have lifted production efficiency to a high point where in 1951 a little over 10 million farm workers were feeding the 155 million people in the United States -- and providing for exports -- or a ratio of one worker on the farm producing enough for himself and over 14 others.

Compare that with the situation 20 years ago, when one farm worker produced enough for himself and 10 others; or 50 years ago when one person on the farm produced enough for himself and only 7 others. It makes clear how production efficiency has advanced, and it makes clear that the rate of acceleration has been increasing.

But the food requirements show we haven't been accelerating fast enough. We've got to go even faster.

The new all-time high farm production needed this year calls for a 6 percent increase over last year's excellent output. A simple way to increase total crop production 6 percent is to increase the crop acreage 6 percent. But we can't do that. Very little new land can be put into cultivation this year. We can expect some help by using cropland now idle, and by more double cropping, especially in the South. We can add some new land through drainage, clearing of brush and woodland, and new irrigation. Even so, the physical task of conversion is such that we can expect to increase the cultivated acreage at the most by less than 2 percent, including that to be added from the idle acreage.

That leaves a 4 percent increase that must be obtained some other way. How will the job be done? By hard work, and by using knowledge developed from research to get more production to the acre. The gains made so far in acre yields, if converted into acres harvested, mean that we have been adding on the average through improved technology the production equivalent of about 5 million acres at 1950 yields.

And that brings the 1952 challenge right down to all agricultural workers as well as to farmers.

To do this job, farmers must be more efficient than ever. The farm labor force probably will continue to shrink because of competing demands for manpower. Shortages are inevitable in some supplies, equipment, pesticides, and fertilizers. Farmers face higher operating costs.

Increased efficiency on the farm must be reflected all along the line. If we are to use most fully our resources, both productive and distributive, both must be efficient. Inefficient distribution means higher prices to consumers or lower returns to producers. We must feed our livestock more efficiently, cut losses from diseases and insects, and reduce losses in harvesting, storing, and marketing our supplies. But the immediate problem is production.

The problem in the case of cotton and feed grains illustrates the situation. Here are the critical points.

Stocks of cotton at the beginning of this crop year were the lowest in 25 years. They are below normal needs -- and these are not normal times. The goal has been set at 16 million bales. This is 5 percent more than was produced in 1951. It must come from about the same acreage as last year. That means we must produce 5 percent more cotton on each acre.

The 1952 goals also put special emphasis on feed grains to support our large and increasing number of livestock. With a goal of 15 percent more corn, we can expect only about 6 percent more corn acreage because of essential competing demands for land. For example, livestock needs require that, in addition to feed grains, there also be a high level of production of grasses and roughage. A fair share of the land must go to this purpose. To reach the goal, therefore, every acre of available land must produce 4 bushels more than we averaged in the 1940-49 period. With grain sorghums the story is the same. Although sorghum acreage is expected to increase, we need to get almost 3 bushels more from each acre than was obtained during the '40's.

You who are doing research on weed control have one of the biggest opportunities to help farm production, not only in 1952, but in the years to come. The toll taken by weeds is a big one. Just how big is hard to figure.

Recent experiments in Ohio, however, show what it means. A corn field treated chemically to control weeds produced 111 bushels to the acre. A similar plot with weeds uncontrolled produced 87 bushels. The difference of 24 bushels represents the loss caused by weeds.

In another experiment weed competition reduced yields from 80 to 30 bushels, a loss of 41 bushels or more than half the crop.

Work reported from South Carolina is even more striking. With 2,4-D to control weeds, 33 bushels per acre were produced on land that yielded only 9 bushels when weeds were unchecked.

The Southern States have a big corn potential. With better cultural practices, including better weed control, development of adapted hybrids, and better fertilization practices, corn yields here are rapidly going up.

Effective weed control, then, can help us to reach those higher yields we need. But the use of chemicals goes beyond that. The fight against weeds has gone on for centuries. The picture of the man with the hoe has not only symbolized farming -- it depicted the farmer's back-breaking job. Chemicals promise to ease that job and do it more cheaply.

An experiment in Mississippi shows what can be done. Costs of weed control with chemicals in a cotton field were 31 percent lower than standard cultivation and hoeing. That means profit -- and less labor.

In the 7 years since 2,4-D came into commercial use, and the 4 years since 2,4,5-T became generally available, farmers have been jumping on the bandwagon by the thousands. Last year 30 million acres were treated with herbicides. Just a dozen years ago inquisitive scientists, wondering about the effect of plant growth regulators, were doing the fundamental research. They didn't have weed control in mind, but what was learned furnished the ideas we have used to make chemical control of weeds a practical farm operation.

It's true that progress has been spectacular. But the job is far from done. The strain on our labor supply in chopping cotton still is an annual headache to Southern growers. We have to make further progress along lines suggested by recent Mississippi experiments. In a cotton field that was given no cultivation at all, plants spaced closer together than usual and with space between rows reduced, produced more than 3,000 pounds of seed cotton to the acre -- better than 2 bales. Chemicals were used to control the weeds. This experiment shows what chemical weed control can do to reduce labor and increase production when used in combination with other good practices.

On range lands the story is very similar. Sand sagebrush and mesquite for years have resisted efforts of Texas and Oklahoma livestock growers to improve their grazing lands. Mesquite grew so high in some places that cattle got lost in the brush. Mechanical means of control were costly. Last year 400,000 acres were treated with chemicals by aerial application. The cost was about $3.25 per acre.

In one Oklahoma area where sagebrush was controlled and the pastures wer improved, beef production went up 50 percent.

We have only begun to exploit possibilities like that. Millions of acre remain untreated, and many species of brush are not affected by use of presen chemicals. We need fundamental research on plant growth, for example, to fin out why present compounds kill 99 percent of the tops of mesquite in some places, but only 50 percent of the roots.

Opportunities in the Southeast in some ways are even larger than in the Southwest. There are 41 million acres of open grazing lands in the 11 Southeastern States. Much of this open pasture land is overrun with brush and weed Even using ground equipment, which runs the cost higher than aerial methods, th way is open for profitable increase in livestock production. For example, a million dollars a year could be saved by dairy farmers in North Carolina, if weeds causing the onion flavor in milk could be eradicated.

The pressure is on us. With demands for 1952 production the highest in history, farmers can't wait 5 or 6 years for us to get all the "ifs" and "buts" straightened out. They need results. They want the latest information we have -- now.

There is no iron clad assurance that supplies of herbicides will be adequate for our needs this year. Farmers must make the best use of what they can get. Last year we used 23 million pounds of 2,4-D -- although only 19 million pounds were manufactured. We cut deeply into inventories. Although large increases are scheduled, the rate of production so far has been short of the goals. Efficient use of available herbicides, therefore, is a must. Our job as research workers is to disseminate information as rapidly and as widely as we can, so farmers will have the benefit of the advances that research makes possible.

The same holds true in all fields. Efficient use of fertilizers is a keystone in our hopes of reaching the production goals. Control of diseases and insects, improved cultural practices, and the use of adapted and proved varieties of crop plants are vital. Prompt technical assistance is needed to help farmers solve the knotty problems that are bound to turn up.

In looking at the 1952 job so far, we have been comparing with the past. We've been looking at where we've been. We need also to look where we're going.

Science makes the 1952 goals possible. We know, too, that State and Federal teamwork in research can make it possible for farmers to push production even higher.

In saying this, I know that I'm not telling you something new. I say it because the full force of 1952's challenge to agricultural research comes at this point. For 1952 is only a symbol. It is a forerunner of things to come. The truth is, we are compelled to raise agricultural production even higher in the years ahead.

The 1952 production program is strictly a defensive proposition designed to keep our Nation strong in these troubled times. No one can foresee how large this defense demand will be, or how long it will continue. We can only be sure it won't end very soon. But regardless of this, our farmers will have to produce more, and still more, in the years ahead. Our growing population is the reason.

We're now growing at the rate of 2½ million people a year. If that sounds like just another figure to you, try to imagine a city like Atlanta springing up to full size in a little over two months. That's what we mean by our growing population.

To feed these additional people, we need to add the production equivalent of 7½ million acres each year to our farm output. That is more than twice as many acres as were planted to corn in Georgia last year. Our population in 1975 is expected to be around 190 million.

A large portion of our feed for livestock comes from pasture and grazing land, and we have to take this into account in figuring out how much additional land we will need to feed these people. If we add the cropland equivalent of pasture and grazing land to cropland used for domestic human consumption for the year 1950, it amounted to 462 million acres, or about 3 acres per person.

Before 1935 we took care of our food requirements as they grew by bringing new land into cultivation, and, because of increased mechanization, by shifting land used to support horses and mules into the production of food. These sources are about dried up. Estimates on irrigation, drainage, flood control, and land clearing show that maybe 30 million acres can be brought into use by 1975. The decline in horses and mules may add the equivalent of another 15 million acres. If we accept these outside estimates, we will still need the production equivalent of 70 million additional acres to feed our population of 1975 at current diet levels. This will have to come from land we now have.

As a matter of fact, we've long since stopped depending on new land, and have been getting most of our production increase by making old land do more. You can truthfully say that we have provided for the needs of our population increase the last 13 years because farmers have learned how to grow more food to the acre.

So far, we've been able to draw on the pool of research findings that were developed over many years. This draft has been exceptionally heavy since 1940. Farmers, once they learned the "long-haired" advice was practical, put more and more of it to use. Some of our best farmers are pretty much up-to-date with research findings. They're breathing down our necks. I wouldn't say that we are scraping the bottom of the barrel, but the storehouse of unused agricultural knowledge has a lot of empty space in it now.

And we don't have much time. It took 60 years after Mendel's work on heredity to produce hybrid corn for commercial use. We can't operate on that basis and expect to meet the farmers' needs in 1975. Not when they must be producing by then an average corn yield of 45 bushels to the acre.

That's 10 bushels more than we averaged in recent years. It's as big an increase as we got from hybrid corn.

Most people agree that hybrid corn is perhaps the biggest single advance contributed by research in our time to higher farm production. But we have to do just as well in the next 23 years.

The opportunities are there. They are as great as corn breeders had when they first started working with hybrids. More than 80 percent of our corn acreage is now in hybrids. But they are not perfect. You can take any one of them and pick out faults that need correcting.

We need better inbred lines on which to build. We need to find out the nature and cause of hybrid vigor. That will require basic research. Actually we get high yields today because every plant is contributing its share, and not because of super vigor. We are using hybrid vigor now, but we don't understand it. We can hardly expect to develop plants of extra or super hybrid vigor until we do that basic research. It's that extra vigor we need to raise yields another 10 bushels.

Then, too, we must know more about plant nutrition. If yields are to be stabilized at 45 bushels or more, we must solve many new problems. For example, we must learn more about the interactions of new practices in fertilization and planting density.

We need more basic information on mineral nutrition. We need to know just how stepped-up applications of one plant food element may lead to unbalance in other plant foods. The radioactive tracer studies begun a few years ago should unlock some of the secrets for us.

We must find more certain ways of controlling insects, and developing disease and drought resistance in corn. These hazards still take a heavy toll. Research on drought so far shows that resistance is apparently associated with both heat tolerance and the water requirements of the plant. But we don't have suitable techniques to evaluate the drought resistance of corn except to grow it under drought conditions for several years. Breeding progress will speed up when we can classify drought resistance more quickly.

Finally, our new hybrids must be adapted to the coming advances in mechanized production. The farmer of 1975 is going to depend on machines and labor-saving methods even more than the farmer of today. He will have to. Among other things, the new hybrids will have to be adapted to general use of chemical weed sprays.

If any of us think the corn research job is finished because we now have high-yielding hybrids, it's time we changed our minds. The challenge to research is greater than ever, and it goes into every field.

Consider grasslands. There are 1 billion acres of grazing lands in the United States. Hay and pasture provide over half the nutrients consumed by all livestock. Demand for meat, especially beef, strains the price structure. Even so, we are eating less beef per capita than we did 40 and 50 years ago. Domestic consumption has caught up with production. We no longer export meat as we did back in the 1890's. Production of meat is the No. 1 problem on the food front today -- as the 1952 production goals emphasize. And with our growing population, the problem won't be solved until we find ways of getting more meat per acre of land.

The research job is to learn how to do it. We already have some information showing the possibilities. For example, unimproved pastures in Pennsylvania yielding 1,000 pounds of dry matter to the acre produced 6,000 pounds after renovation. It would take almost 90 bushels of corn to provide as many feed nutrients. And this was on land too steep and unproductive for growing corn.

Feeding high-quality forage is an economical proposition, and it produces results. In Tennessee, dairy cows fed 5 years on forage alone produced 8,000 pounds of milk a year, well above the 1950 national average of 5,202 pounds.

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Feeding tests in New Jersey showed that dairy heifers could be raised from birth to 2 years of age with as little as 500 pounds of grain, when fed all the high-quality alfalfa hay they could eat. The heifers gained as much as those fed 2,250 pounds of grain, and their gain was more economical. It was possible only because high-quality forage was fed.

Steers fed only on Italian rye grass winter pasture at the North Mississippi station gained 2.30 pounds a day, or 326 pounds per acre, with a net profit of $84 a steer. Comparable steers fed grain in dry lots gained 2.46 pounds a day, but made a net profit of only $48.

One point in the grasslands program now under way in cooperation with the land-grant colleges will interest every farmer. And that is the saving in costs and greater returns per man-hour of labor that can be realized. Results in North Carolina bearing on this have been cited before, but the story is worth repeating. Using cropland for the experiment, 100 pounds of digestible nutrients from improved pasture cost 58 cents. From alfalfa hay, the cost was $1.35; from corn $1.77; and from oats $2.07. The return per man-hour of labor for wheat was $5.81; for corn, $3.69, and for oats, $2.79. The return for pasture was $23.09. Figures like these on a farmer's balance sheet are money in the bank.

I cite these results to show you the extent of the challenge to research. The potentials are sky-high. We have a better potential for increasing production on grasslands of the South than anywhere else in the United States. Look what an investment of $4.18 per acre for fertilizer and lime brought in a test at Experiment, not too far from here. Production of beef on permanent pasture increased from 183 pounds to 540 pounds, a gain of 357 pounds of beef to the acre. It cost only a little over a penny a pound for beef on the hoof.

Most of the 230 million acres of grasslands in the humid eastern part of the United States are unimproved. Almost bare, eroding hillsides, scattered brush, weeds, and the every-present broom sedge and poverty grass are sure signs of neglect. Even with the limited knowledge we now have, some of these lands could be improved enormously.

It has been estimated that if all these eastern lands could be improved, and if the 70 million additional acres of abandoned, idle, and submarginal cropland this side of the Mississippi could be converted into improved grasslands, we could carry 97 million additional animal units in this area. That is about 31 percent more than we are now carrying in the entire United States. Convert this to beef, and you would have plentiful supplies for future generations. It is a long-range proposition, and it will take real doing to make this dream come true.

Research must dig out the hard facts which farmers need. They must be able to establish the improved pastures more economically, and with greater certainty of success.

Here in the South, research must find the best mixture of the 30 to 40 improved species already available for pastures. We must continue breeding adapted varieties of legumes and grasses. And research must find the way to produce seed supplies of the better varieties more quickly and in sufficient quantities. The Foundation Seed Program is only a start. New techniques are needed to push this work faster. Then, too, we need to do more fundamental research on animal physiology and pathology to develop the best management practices under grassland farming. We need to learn more about bloat.

We must improve our knowledge of rotations. We know that grasslands are required in crop rotations to get the sustained maximum production of other crops. No other cropping system has been developed that will maintain organi matter in the soil. The steady loss in organic matter in some of our best soils means we'd better get busy and reverse the trend. Improved grasslands not only can reverse the trend; they can give us a double-barrelled profit in increased livestock production with less cost and labor.

I'm sure that you who work with weeds already see how your research fits into these patterns. You know we need to increase the efficiency of the chemical compounds used to control weeds. We have made no headway in control of such perennials as Johnson grass -- a good grasslands crop but a terror in the cotton fields. And we might as well admit that we are a long way from perfect control of the annual weeds in cotton.

The surface has only been scratched in use of chemicals. The vegetable side has hardly been touched. Beets, beans, peas, and strawberries offer the most promising prospects in the immediate future. We must go into the other horticultural crops more intensively. The opportunities in your field are wide open.

We don't have time to go into the equally great potentials in plant and animal breeding, eradication or control of diseases, control of insect pests, and in engineering. But they are just as important and deserve the same type of analysis to see where we're heading, and if it is the way we should go.

The point is that in all agricultural fields, research must develop the methods and provide the tools farmers should have to meet our food requirements. Agriculture faces a real job just to hold what we've gained in controlling diseases and insects and maintaining our soils. To supply 190 million people with food in 1975, we must do a great deal more than that.

At this time we cannot predict our course with certainty. We don't know how well we will meet the challenge. There's one point, however, on which I have no doubt at all: Research holds the answer to the challenge of 1952 and all the years to come. What we as a Nation do about it will tell the story.

MINUTES OF THE SOUTHERN WEED CONFERENCE

February 8, 1952

Biltmore Hotel, Atlanta Georgia

Dr. G. M. Shear, President, presiding

President Shear asked for the Treasurer's report. The following report was submitted by Glenn C. Klingman:

RECEIPTS

Cash from O. E. Sell	$181.06	
Cash from A. J. Loustalot including receipts from 1951 Conference	278.00	
Cash from sale of Proceedings after the 1951 meetings	190.04	
Total Cash Receipts		$649.10

EXPENDITURES

Cost of producing 4th Proceedings (1951)	$211.87	
Postage	31.34	
Printing letterheads and envelopes	68.50	
Checkbook	1.00	
Promotion of Regional Assoc. Weed Conference (mailed to R. L. Lovvorn)	50.00	
Badges for 1952 Conference	29.72	
Printing 1952 programs (600 copies)	60.00	
Cost of distributing 1952 Conference programs	26.01	
Screen for projection purposes	10.00	
Total Expenditures		$488.44
Total Cash on Hand		$160.66

W. E. Chappell moved that the Treasurer's report be accepted. Seconded by Mark Weed. Motion carried.

The Treasurer discussed the advisability of establishing some procedure for auditing the Treasurer's account. He asked that an auditing committee be established and that guidance be given as to the type of records needed for the best interest of the Society; also a type that would fit the time allowance of a Secretary-Treasurer.

J. B. Harry moved that an auditing committee be established. Seconded by V. S. Searcy. Motion carried.

President Shear asked the Secretary-Treasurer to discuss next years meeting plans. The possibility of alternating meeting years with the Association of Regional Weed Control Conferences was discussed. With the national meeting tentatively scheduled for next year, the Southern Conference had the opportunity of cancelling its meeting and attending the National Meeting, or the

Southern Conference could hold its meeting and give as much support as possible to the National Meeting. It was stated further that the Executive Council had voted to cancel the 1953 Southern Weed Conference meetings in favor of full support to the Association of Regional Weed Control Conferences. It was suggested that a portion of the National Meeting be devoted to sectional problems of immediate importance.

H. E. Rea moved that the Southern Weed Conference meet with the Association of Regional Weed Control Conferences in 1953, provided that sectional meetings can be provided. Seconded by _____.
After discussion the motion was withdrawn by Rea.

E. R. Stamper moved that the Southern Weed Conference meet as usual next year and give as much support as possible to the national meetings. Seconded by L. S. Rauton. Motion carried.

President Shear asked the Secretary-Treasurer to read the recommendation of the Executive Council concerning the appointment of a terminology committee. V. S. Searcy moved that a terminology committee be established to standardize chemical names and terminology used in weed control. Seconded by W. E. Chappell. Motion carried.

D. A. Hinkle, as Chairman of the Technical Research Committee and also as Chairman of the Technical Committee for S-18, discussed the need for integration of the two committees. Following a discussion, Dr. Hinkle moved that the S-18 technical committee be made a part of the Southern Weed Conference Research Committee. L. E. Creasy moved that the original motion be amended to state that the S-18 technical committee be added as a subcommittee to the Southern Weed Conference Research Committee. Amendment seconded by S. J. P. Chilton. The amendment lost.

P. J. Talley moved that the original motion be amended to state that the S-18 Research Committee be added as Ex-Officio members of the Southern Weed Control Research Committee. Motion seconded and the amendment carried. The original motion as amended thence carried.

E. C. Tullis, Chairman of the Legislative Committee, reported that legislation affecting weed control work was passed this past year in Texas and Arkansas.

S. P. J. Chilton, Chairman of the Nominations Committee, presented the list of nominees for the coming year. D. A. Hinkle and E. R. Stamper were nominated for president; W. B. Ennis, Jr. and E. S. Hagood were nominated for vice-president; and W. B. Albert, L. E. Cowart, H. A. Nation, and H. E. Rea were nominated to be members of the Executive Board. The following were elected:

President	: D. A. Hinkle
Vice-President	: W. B. Ennis, Jr.
Executive Board	: W. B. Albert
	H. A. Nation

Nominations for Secretary-Treasurer were not offered since the office was to continue one to two years more. Therefore, G. C. Klingman will continue for the coming year.

Meeting adjourned.

Glenn C. Klingman
Secretary-Treasurer