SECTION 131

FOURTH ANNUAL EARTH RESOURCES PROGRAM REVIEW OF NASA/MSC

1971 CORN BLIGHT WATCH EXPERIMENT

by

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This afternoon I would first like to draw a conclusion in connection with the Corn Blight Watch Experiment. The Experiment was successful. To support this conclusion, I would like to examine with you the objectives of the program and evaluate the accomplishments against these objectives.

OBJECTIVE NO. 1

Detect the development and spread of corn blight during the growing season across the Corn Belt.

Accomplishments to be evaluated against this objective, are:

1. Corn blight was detected early in August using remote sensing techniques. This was accomplished with both machine processing and photo interpreters.

2. Blight was detected and reported earlier in the season by field enumerators, and

3. Data sufficiently valid to locate and trace blight in the Corn Belt was available, but activity was limited because of market sensitivity and lack of resources.

OBJECTIVE NO. 2

Assess different levels of infection presented in the Corn Belt.

Accomplishments to be evaluated against this objective are:

1. Blight was discriminated with a good degree of validity when infection was moderate to severe by our standards. It was difficult to discriminate healthy corn from mildly infected corn.

2. I feel comfortable about discriminating severely infected corn from mature corn.

3. There is some indication that further research may prove that under comparable circumstances and given the benefit of last year's experience, earlier detection of blight by remote sensing techniques may be possible. We learned that many factors such as the type of soil and nutrients, drouth, drowned-out areas, row direction, other diseases, etc., made this an extremely difficult problem. On the other hand, there is a rather strong indication that blight occurs rather uniformly throughout a field and that consequently, as you zero in on the total field response to the exclusion to these noise factors, the probability of accurate identification is substantially increased.

OBJECTIVE NO. 3

Amplify information acquired by ground visits to better appraise current blight status and the probable impact on crop production by blight.

The evaluation factors are:

1. Correlation between ground data obtained by enumerators in the field and remote sensing data was good during stages when infection was best identified by remote sensing techniques.

2. Notwithstanding the fact that it was necessary to compromise the statistical model for flight efficiency, the data can be amplified with a reasonable degree of accuracy with respect to the Corn Belt. The total potential in this area was not fully exploited due to the lack of resources and the sensitive nature of the data.

OBJECTIVE NO. 4

Estimate through extrapolation the applicability of these techniques to similar situations occurring in the future.

Evaluation indicates that the techniques applied to this situation can be adapted to other comparable situations with a high degree of confidence.

These are the factors that support the conclusion that the Corn Blight Watch Experiment was a successful effort--but this is not all--there are other pluses that resulted from the Experiment that I would like to call to your attention:

1. It was a first in organization and management. Never before have so many and diverse elements been blended into a viable working unit--it can be done again whenever the need arises.

2. Research was forced into a "real world" situation, and in my opinion, profited because of it. I would like to emphasize at this point that for research to be most helpful to the operating elements, it is essential that the design of research projects be oriented to the solution of operating problems.

3. Gratifying progress was made in the identification of corn and other crops, although this was not a primary objective of the program.

4. There is substantial evidence that leads us to conclude that not only can corn be identified, but that varieties of corn (resistant and nonresistant) within the same field can be discriminated.

5. The experiment provided the foundation for follow-on developmental efforts in the inventory of earth resources and identified constraints appropriate to such efforts.

6. Some hard lessons were learned on how to handle large volumes of data on a near real-time basis--this experience should help us all in handling the monstrous volume of data that lies ahead for all of us.

In conclusion then, the project rates an unqualified "successful venture" in my book--it was worth every dollar and every drop of sweat from the overworked brows.

I would now like to deal briefly with a misconception that has disturbed some people. The fact that farmers produced some 5 1/2 billion bushels of corn in 1971 should in no way detract from the validity or success of the Corn Blight Experiment. Let me make a couple of real clear statements in that connection. First of all, it was an experiment, and Dr. Bauer earlier explained to you why the corn production for the past year was high.

We did not attempt to design this Experiment to influence the production of corn, nor did we feel that we could control the southern corn leaf blight if and when we found it.

We did, however, design the effort to find out if remote sensing techniques could provide farmers and management with current data that would help them make decisions and whether these techniques could be adapted to other situations.

We did not expect the Experiment to, in any way, financially impact the domestic economy in 1971. I trust this clarifies our objectives and puts to rest some misconceptions about the effort.

Now I would like to take this opportunity, speaking on behalf of USDA, to express our sincere appreciation for the total commitment of all parties involved in the effort--without the dollars, the bodies, and the commitment, this would have been just another exercise. As it turned out, it was in my opinion, another "Giant Step for Mankind" for which NASA is already famous. This effort will, I believe, go into the record books as one of the turning points in the evolution of the Earth Observations Program. It certainly was the basis for initiating the on-going USDA/NASA discussions to further pursue those developments of the Corn Blight Watch Experiment that appear to be promising. We in ASCS, and I feel confident in saying in the USDA, believe there is a great deal of promise in the technology developed by NASA and the Centers of Excellence, and plan to utilize and extend this know-how to the solution of Agriculture-Forestry problems. It is our view that it is in our (USDA) field of effort that remote sensing has its most promising future.

Thank you for inviting me to participate with you in this Fourth Annual Earth Observation Program Review--it has been a most enjoyable and pleasant experience.

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