

PROJECT APPRAISAL REPORT (P/)

9310471-6
PD-AAC-803-C1

PROJECT NO. 130-471	2. PAR FOR PERIOD: 7 May 73 TO 15 Jun 74	3. COUNTRY W/W	4. PAR SERIAL NO.
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PROJECT TITLE
Improvement of the Nutritional Quality of Wheat Through Increased Protein Content and Improved Amino Acid Balance - University of Nebraska AID/csd/1208

PROJECT DURATION: Began FY <u>66</u> Ends FY <u>77</u>	7. DATE LATEST PROCP	8. DATE LATEST PIP	9. DATE PRIOR PAR
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U.S. FUNDING	a. Cumulative Obligation Thru Prior FY: \$ <u>1,843,614</u>	b. Current FY Estimated Budget: \$ <u>320,000</u>	c. Estimated Budget to completion After Current FY: \$ <u>1,000,000</u>
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11. KEY ACTION AGENTS (Contractor, Participating Agency or Voluntary Agency)

a. NAME University of Nebraska	b. CONTRACT, PASA OR VOL. AG. NO. Contract 1208
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I. NEW ACTIONS PROPOSED AND REQUESTED AS A RESULT OF THIS EVALUATION

A. ACTION (X)			B. LIST OF ACTIONS	C. PROPOSED ACTION COMPLETION DATE
AID	AID/W	HOST		
	AID		Amplification of the project to provide means for evaluation of farms with regard to their efficiency in utilizing available soil nutrients and also with regard to the effect of soil and environment on protein production	Jan 1975
		U. of NEB.	Evaluation of data already compiled in rat and mouse nutrition studies, to evaluate these animals for use in screening studies.	Oct 1974
	AID		Increase in the number of graduate assistants employed in the project. This number is now decreased to one for budgetary reasons which tends to negate the training aspect of the project	Feb 1975
	AID		Expedition of the Basic Ordering Agreement which has been under preparation for several months.	Sept 1974
	AID		Consideration of the advisability of delegating responsibility to the University of Nebraska for research on the protein content and quality of Spring Wheat as well as Winter Wheat	Sept 1974
	AID		Procurement of a special apparatus for measuring nitrite for use in the research being carried out on nitrogen metabolism	Sept 1974
	AID		Recommendation of the project for a special commendation for meritorious service	Jul 1974

REPLANNING REQUIRES	REVISOR OR NEW:	<input type="checkbox"/> PROP	<input type="checkbox"/> PIP	<input type="checkbox"/> PRO AG	<input type="checkbox"/> PIO/T	<input type="checkbox"/> PIO/C	<input type="checkbox"/> PIO/P	E. DATE OF MISSION REVIEW
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PROJECT MANAGER: TYPED NAME, SIGNED INITIALS AND DATE Russell Desrosiers <i>RD</i> 9 Jul 74	MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE
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III. Improvement of the Nutritional Quality of Wheat Through
Increased Protein Content and Improved Amino Acid Balance -
University of Nebraska AID/csd/7-08

Narrative:

The work of this project is progressing in a highly satisfactory manner and excellent progress is being made towards the achievement of the objectives of the project. Germplasm is available by means of which the protein content of wheat can be increased by at least 4 to 5 percentage points above the average for common wheat, which is about 12.5%, and lysine content by about 0.5 percentage points. This latter represents a 20% increase over that of present varieties. These factors are being regularly incorporated into varieties of acceptable agronomic quality and breeding lines have already been distributed. High protein varieties, derived from Atlas 66 have already been released in the United States and are under trial elsewhere. Others are expected to follow. To date, no special effort has been made to follow up on the extent to which the results of the Nebraska research have been utilized in the LDCs. It is known that European breeders are well aware of the Nebraska work and are taking full advantage of it.

Further plans for the study of nitrogen metabolism, a part of Contract csd-1208 are being made. This work has strong implications for the Agency's interest in increased efficiency of the plant in making use of available nutrients and the emphasis on low input agriculture. This work will proceed under the direction of Dr. Klepper.

The need for a study of the soil and environment with regard to their effect on protein production and other aspects of varietal performance is evident. There is a need to evaluate varieties with regard to their efficiency in utilizing available soil nutrients in view of the worldwide fertilizer and energy shortages. The importance of the high protein lines, as probably being more efficient in nitrogen absorption, has been suggested by project scientists. There is, also, a need for a survey of the disease and insect problems of the wheat growing areas. These features could be carried out in conjunction with the International Winter Wheat Performance Nurseries Program but additional funding would be required.

The contractor is using the mouse in routine screening work on new material of which only very limited quantities of grain are available. The rat is being used on material farther advanced in development of which grain is available in greater quantity. At the moment, the

Nebraska scientists believe that the mouse data, although deemed to be not as precise as rat data, are nevertheless adequate for their preliminary screening purposes. This question will be given further attention by the Nebraska staff, especially before they move into their new facility early in 1975. A technique using reduced numbers of rats for screening is being discussed.

There is, at present, provision for only one graduate assistant in the project. Additional ones are needed and steps should be taken to remedy this. The contract has suffered some budgetary setbacks as a result of salary and wage increases imposed recently by Nebraska law without any corresponding increase in funds. A saving has been achieved by having the University accept a flat fee for administrative services rather than the increase in overhead to 65%. Salaries of two professionals have also been moved to University funding which also helps.

The importance of developing Spring as well as Winter Wheat with improved protein and lysine content is evident. This is already being done to some extent by the project and cooperation with CIMMYT in this field is increasing.

**SUMMARY PROGRESS STATEMENT
ONGOING PROJECTS**

Project No: 931-17-130-471 TA-1093

Project Title: Improvement of the Nutritional Quality of Wheat Through Increased Protein Content and Improved Amino Acid Balance

Contractor: University of Nebraska, Lincoln, Nebraska

I. Implementation Progress

<u>Outputs</u>	<u>Progress to Date & Relationship to Project Purpose and Goal</u>
<ol style="list-style-type: none"> 1. Identification of nutritionally superior wheats and combination of these with adapted varieties having other desirable characteristics. 2. Development of methods for rapid identification of nutritionally superior genotypes. 3. Distribution of improved material to LDCs and international institutions. 4. Training of LDC personnel. 5. Establishment of exchange linkages. 	<ol style="list-style-type: none"> 1. More than 16,000 bread and related wheats and entire Durum collection screened for protein content and quality. 2. International Winter Wheat Performance Nurseries (IKWPN) at 55 sites in 35 countries. 3. 26 lines of high protein germ plasma obtained through crosses with U.S. variety "Atlas 66" released through the project and samples of seed sent to 18 cooperating LDCs. Variety "Bezostaia" and "Eolal" now widely planted in Turkey and "Belinda" in South Africa. 4. 21 foreign students trained. 5. First International Winter Wheat Conference held in Ankara, Turkey, 1972. Latin American Wheat Conference held in Porto Alegre, Brazil, 1974. 6. Rapid <u>in vivo</u> screening test for high protein in wheat seedlings perfected. Will work on other plants as well. 7. Side effect of this technique is determination of mode of action of most herbicides and plant specificity of surfactants.

II. Project on Schedule

Project is progressing according to plan.

III. Significant Change in Project Proposed

Additions to scope of work include 1) study of effects of soil and other environmental factors on protein content; 2) expansion of plant physiology phase of project to include study of photosynthetic efficiency and nitrogen loss; 3) inclusion of study of symbiotic nitrogen fixation. These features approved by R and D and RAC Committees and new contract being prepared.

IV. Role of TA Technical Office - Man/days required

Approximately 20 man/days.