



FRASS

INSECT REARING NEWSLETTER

Vol. II

January 1976

No. 1

The response to FRASS has been very gratifying for the people who have devoted the effort required to organize and get it produced. The extent of the international interest in FRASS has been a pleasant surprise. The number of issues mailed outside the USA exceed 60. The newsletter would serve a real purpose if it performed no other function but to encourage the international exchange of rearing information. Remember, the newsletter represents a mutual effort of the people involved in insect rearing. Current coordinators are:

Southern U.S. - M. C. Leppla, J. R. Raulston, and F. D. Brewer

Western U.S. - M. A. Patterson, R. Patona, and J. L. Roberson

North Central U.S. - M. A. Dickerson

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The first mailing of FRASS (Jan. 1975) consisted of 251 copies. This issue will require 500 copies. You can see the magnitude of the endeavor has increased significantly with each issue. Provisions have been made for producing the next 3 issues; however, the long term survival of FRASS will require effective financial and organizational support. Listed below are 3 possible options that could provide such support. Please consider these options and indicate your choice. Additional suggestions are welcomed. In any case, please return the name and address section because these will help construct the next mailing list.

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1. Affiliate - Responsibility might be transferred to an established entomological society. A regional society or possibly the ESA might be approached.

FRASS was planned as a vehicle for communication among scientist involved in insect rearing. We encourage entries, especially those concerning useful discoveries, unusual problems encountered, needed resources and examples of how the newsletter has benefited you. Please direct all correspondence to one of the coordinators. M.A. Dickerson will compile the July issue.

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2. Incorporate - An organization could be formed whose overall objective would be to serve the discipline of insect rearing. The responsibility for FRASS would be assumed by this organization. Members would be assessed an annual fee of about \$1.00-\$2.00.

3. Sponsor - Seek a non-partison benefactor (ie. grant in aid, etc.). An organizational structure such as in option 2 would probably be required but there would be no need for dues. Please suggest a sponsor if you check this option.

4. Other - _____

Name _____

Address _____

T. S. Adams - I am chairman of the Insectary and Insect Allergies Committee at the ARS Metabolism and Radiation Research Laboratory. We rear the following insects at our installation: house fly, stable fly, screwworm fly, false screwworm fly, tobacco hornworm, pink bollworm, Med. flour moth, corn earworm, codling moth, boll weevil, Colorado potato beetle, Madeira cockroach and the milkweed bug. We have noticed that 50% or more of our employees who are in close contact with these insects have developed insect allergies. We would like to know how widespread insect allergies are in other insectaries.

Cor. M. Schippes - I am involved with rearing Oryctes rhinoceros. The diet consists of rotten kapokwood mixed 50/50 with cow dung. Our program uses about 4,000 kg/month. Larvae grow faster on cow dung with 70% moisture than on same but sterilized. I suspect microorganisms to be essential for O. rhinoceros growth. Does anyone know which microorganism is most likely to cause this faster growth?

Yoran Rossler - Presently, we maintain stocks of various homopterans and seek some advice on the possibilities to rear the Florida Wax Scale, Ceroplastes floredensis. Any ideas? I am particularly interested in parasites of the Florida Wax Scale and any piece of information will be appreciated.

Dr. Pritam Singh - (1) A general purpose artificial diet for rearing insects has been formulated and developed under U.S. Patent No. 174449. For further information you may contact Biological and Chemical Division of Diga International Co., 9233 Colorado St., P.O. Box 7004, Riverside, California 92503 or Dr. Pritam Singh, Entomology Division, D.S.I.R., Private Bag, Auckland, New Zealand.

(2) In the July issue of FRASS I mentioned that I am preparing a manuscript for a book "Insect Dietetics." I intend to include a chapter on artificial diets that are commercially available to breed insects and other Arthropods. I would appreciate being notified of any companies that produce Arthropod diets.

H. A. Petterson - The following are two sources of insect diets and diet ingredients that may be helpful to your readers:

1. Diet Manual 1976: ICN Pharmaceuticals, Inc.
Life Science Group
26201 Miles Road
Cleveland, OH 44123
2. Biological Test Diets and Equipment: Bio-Serv., Inc.
P.O. Box 100
Frenchtown, NJ 0832

H. A. Dickerson - (1) I have 25-30 cases of Cell-Pac 15 cell paper trays for holding 1 oz. cups. I will gladly trade for rearing supplies of equal value.

(2) A revised index for colonized insects will be in the July issue of FRASS. Extensive additions to the last index have been received since the last issue. If you have additions to this index, please send them promptly to H. C. Leppla or me. The intent is to make this index as complete as possible.

L. G. Pickens - (1) A reduction in cost of materials and upkeep of rearing cages for parasitic wasps was achieved by making rearing cages of a 10-inch diameter cylinder of screen stapled to 5/8" plywood and placing this inside a clear plastic bag which is closed with a rubber band. The result is a very inexpensive, easily constructed, clean cage.

(2) The longevity and oviposition rate of the stable fly, Stomoxys calcitrans L., was improved by using "chitterlings" as feeding membrane instead of using blood-soaked cotton or sponges. The "chitterlings" are soaked in water, stretched over the mouth of a 3 x 5 cm plastic vial, filled with citrated blood and fastened with a rubber band. The vial is then inverted and placed on the top of the screened colony cages. The "chitterlings" are available frozen from grocery stores and can be reused many times.

R. P. Smith - Dr. T. Nakatsugawa and I developed an efficient, economical and predictable technique for rearing the housefly, Musca domestica. The procedure has been written up in detail but never published. I would be willing to send any interested party a copy.

Employment - Position Wanted: Extensive experience in insect rearing with major emphasis on mass rearing of H. zea and T. ni. Microbiologist with broad experience in insect pathogen production, and entomology research. For further information contact FRASS, P.O. Box A, Columbia, MO 65201 Telephone (314)442-2271, ext. 3194.

Positions Available: Controller For Insectary Services Candidates should be in possession of a Ph.D. degree, preferably in insect or animal pathology, but possibly also in zoology, biology, or physiology. Responsibilities include (a) planning insect and animal breeding unit; (b) conducting experiments needed to establish practices for breeding target insect and laboratory animals; (c) supervising operations of the rearing units; (d) training staff. Salary will be commensurate with candidates qualifications. For additional information, contact:

Deputy Director
ICIPE Research Centre
P.O. Box 30772
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(This item reached FRASS January 12, however, a note was attached asking for applications by December 1, 1975)

Current Sources and Prices for Insect Rearing Supplies

<u>Item</u>	<u>Description</u>	<u>Source</u>	<u>Cost</u>
Agar	fine	Morehead & Co. 14801 Oxnard St. Van Nuys, CA 91401 213-873-6640	\$5.45/lb in 100 lb lots or more
Alfalfa	meal	Nutrilit Products P.O. Box 98 Lakeview, CA 92353 714-521-3900	\$.45/lb
Aureomycin	chlorotetracycline soluble powder, 64 g/lb	Ozark Supply Co. American Cyanamid 1614 Wyoming Kansas City, MO 816-229-6100	\$117.30/25 lb
Alphacel	non-nutritive, bulk	Nutritional Biochemicals, Inc., 26201 Miles Road Cleveland, OH 44123 216-662-0212	\$96.00/cwt
Ascorbic Acid		Roche Chemical Division Hoffman-LaRoche, Inc. Nutley, NJ 07110 201-235-5000	\$4.56/lb in 1-5 lb quant. \$4.31/lb in 6-10 lb quant. \$4.08/lb in 11-25 lb quant.
Calcium alginate	Kelgin HV	Kelco Co. 20 N. Wacker Drive Chicago, IL 60606 312-372-1352	\$212.00/cwt
Gelcarin	HMG	Marine Colloids, Inc. 2 Edison Place Springfield, NJ 201-379-6620	\$350.00/cwt
Casein	crude, 80 mesh	Milk Specialities P.O. Box 278 Dundee, IL 60118 312-426-3411	\$.70/lb
CSII		Krause Milling Co. 4222 W. Burnham St. P.O. Box 1156 Milwaukee, WI 53215 414-272-6200	\$.15/lb

ETOH		U. S. Industrial Chem. Co., Box 7157 Louisville, KY 40207 502-426-6100	\$1.36/gal \$74.80/55 gal drum
Formaldehyde	40%	Fisher Scientific 1241 Ambassador St. Louis, MO 63132 314-991-2400	\$12.24/5 gal
KOH	45%	Fisher Scientific	\$27.77/5 gal
Linseed Oil	raw	GSA	\$30.00/5 gal
Methyl-p	Methyl-para hydroxybenzoate, technical	Tenneco Chemicals, Inc. 56 N. Elston Ave. Chicago, IL 60630 312-236-5333	\$2.42/lb in 100 lb quant. \$2.50/lb in 50 lb quant. \$2.60/lb in 25 lb quant.
Pinto beans	whole	Bemhem & Co. % T. W. Holt, Inc. P.O. Box 2948 Jacksonville, FL 32202 904-356-8535	\$20.85/cwt
Potassium Sorbate, powder	Sorbistat K	Pfizer Corp. 6450 W. Courtland St. Chicago, IL 60635 c/o J. H. Dugger, Res. Mgr. 312-381-9500	\$240.00/cwt
Salt mix (H)	Wesson	Nutritional Biochemicals Co. Cleveland, OH 216-831-3000	\$30.50/25 lb
Soy Protein	Supro 510 100 mesh	Ralston Purina Co. Checkerboard Square St. Louis, MO 63188 314-982-0111	\$.67/lb Min. 50 lb
Tenox	PG	Eastman Chemical Prod., Inc. Order Services Kingsport, TN 37662 615-246-2111	\$9.35/5 lb
Vitamin Pre-mix	#26262	Roche Chemical Div. Hoffman-LaRoche, Inc. Nutley, NJ 07110 201-235-5000	\$2.50/lb

Wheat
*No longer
available

H. V. Nootbaar Co.
P.O. Box 2696
Capistrano Beach, CA
714-493-2676

\$.15/lb
(2000 lb
minimum)

Wheat germ toasted, regular

Kretchmer Products
Inter. Multifoods Corp.
1200 Multifoods Bldg.
Minneapolis, MN 55402
612-340-3300

\$.50/lb

WSB
(wheat soy
blend)

Krause Milling Co.
4222 W. Burnham St.
P.O. Box 1156
Milwaukee, WI 53215

\$.15/lb

Yeast - torula

St. Regis Paper Co.
Lake States Division
603 W. Davenport St.
Rhineland, WI 54501
715-369-4100

\$.32/lb
in drum
\$.30/lb in
bag

Containers & Other Supplies

Cups-plastic 1 oz.

Thunderbird Container
Corp.
P.O. Box 12033
El Paso, TX 79012
915-584-1151

\$33.25/5000
(case)

Lids-1 oz paper (press in)
1.476 diam.

Standard Cap & Seal
P.O. Box 80336
Chamblee, GA 30341
404-457-6332

\$20.00/10,000

Tray 50 cell
#J-2

Trend Mfg. of America
1663 N. McDuff Ave.
P.O. Box 6915
Jacksonville, FL 32205
904-388-6525

\$63.15/M

Mylar lidding for
50 cell tray

Sandoz-Wonder Corp
18900 S.W. 280th St.
Homestead, FL 33030
% David Shible
305-247-7875

\$127.00/r1
(4500 ft)

Viva paper Specify
towels blue only

Scott Paper Co.
Bob Shell, Production
Manager
Scott Plaza
Philadelphia, PA 19113

\$14.77/case
(10 cases
minimum)

Cell-Pac, (CP-25)	Autoclavable holders for Thunderbird 1-ox cups	Diamond National P.O. Box 697 Phoenix, AZ 85001	\$9.54/case (400 pks/case)
Alfalfa Meal	Fine ground	Nutralite Products P.O. Box 98 Lakeview, CA 92353	\$1.45/lb in 200 lb lots
Choline Chloride Crystals		ICM Pharmaceuticals 26201 Miles Road Cleveland, OH 44120	\$1.0115/gm
Hexcell	Expanded resin- coated honeycomb HRH-10	Hexcell Corp. 6151 W. Century Blvd. Suite 1114 Los Angeles, CA 90045 213-776-8740	

RECENTLY PUBLISHED ARTICLES

- Petterson, M. A. 1975. A comparison of cottonseed meal, alfalfa meal, and hominy feed diets for rearing the cabbage looper. *Annals of Entomol. Soc. of Amer.* (Submitted)
- Petterson, M. A. and J. W. Debolt. 1975. Reusable plastic trays for rearing beet armyworms and cabbage loopers. *J. Georgia Entomol. Soc.* (Submitted)
- Hoffman, J. David, C. H. Ignoffo, and Willard A. Dickerson. 1975. In vitro rearing of the endoparasitic wasp, Trichogramma pretiosum. *Ann. Entomol. Soc. Am.* 68:335-6.
- Roberts, Mary-Dawn and A. R. Stevenson. 1974. Carrot Weevil: A laboratory rearing method. *J. Econ. Entomol.* 67:140.
- Stadelbacher, E. A. and F. D. Brewer. 1974. Dispensers of insect diets made from a stainless steel sprayer. *J. Econ. Entomol.* 67:312-13.
- Morrison, R. K., V. S. House, and R. L. Ridgway. 1975. Improved rearing units for larvae of a common green lacewing. 1975. *J. Econ. Entomol.* 68:321-22.
- McWilliams, J. M. and J. H. Cook. 1975. Technique for rearing the twolined spittlebug. 1975. *J. Econ. Entomol.* 68:421-22.

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FRASS

INSECT REARING NEWSLETTER

Volume II

July 1976

No. 2

The enthusiasm for "Frass" exhibited by the numerous letters and phone conversations has made serving as coordinator-editor for 1976 very enjoyable. The January and July 1977 issues will be handled by Tom O'Dell, the Northeastern U.S. representative. His address is: USDA Forest Service, Forest Insect and Disease Laboratory; 151 Sanford St., Hamden, Connecticut 06514. The other current coordinators are:

North Central U.S. - W. A. Dickerson

Western U.S. - H. A. Patterson, R. Patona

Southern U.S. - H. C. Leppla, J. R. Raulston, & F. D. Brewer

A questionnaire regarding long-term financial and organizational support for this newsletter was included in the January 1976 issue. Three approaches were suggested: (1) Affiliate - transfer the responsibility to an established organization, (2) Incorporate - form an organization to provide the necessary services, and (3) Sponsor - seek a benefactor to support "Frass." Of the questionnaires that were returned, 12, 44, and 9 voted for the respective suggestions. Therefore, procedures for incorporation are being explored, and a final decision will be made in 1977.

The most important consideration for this future planning will be commitments from prospective annual coordinators. These individuals will represent our group and compile at least two newsletters during the year. Those of you that wish to volunteer or that have helpful ideas concerning the organization are encouraged to contact your regional coordinator or Tom O'Dell.

A. H. Baumhover, USDA-ARS-Tobacco Insects Research, Oxford, NC 27565 - CSM, though widely heralded as an excellent major ingredient in Lepidopteran diets, is not always readily available because the manufacturer is not currently producing it, is reluctant to sell in small quantities or states that the material is for export only. We have found it rather simple to concoct our own substitute (CS) using only 64% yellow cornmeal, available from a local processor at \$16/cwt and 36% soy flour, 200 mesh, 20 P.D.I., fully heat treated, available from Corgill Protein Products Dept. Corgill Bldg., Minneapolis, MN 55402,

at \$10.63/cwt as of March 16, 1976. We have not found it necessary to add any of the other ingredients normally found in CS. Our current universal diet for Manduca sexta, I. quinquemaculata, Heliothis virescens and H. zea is as follows (plus microbicides and gelling agents):

CS	120 g
Sodium caseinate	16 g
Torula yeast	64 g
Cholesterol	1 g
Roche vitamin pre-mix	10 g
Water	1000 ml

This diet was developed initially for Manduca, but is satisfactory for all four species.

M. A. Dickerson, USDA-ARS-Biological Control of Insects Research, P.O. Box A, Columbia, Missouri 65201 - (1) I have 10-15 cases left of the Cell-Pac 15 cell paper trays for holding 1 oz cups. I will gladly trade for insectary supplies of equal value.

(2) Sodium Sulfamethazine and methenamine at 1-2 g/gal. of diet provide excellent bacterial control. Both of the materials have been used with or in place of chlortetracycline for up to 3 generations in the larval diets of Trichoplusia ni, Pseudoplusia includens, Pieris rapae, Spodoptera exequa, Heliothis zea, H. virescens, and Anticarsia gemmatilis with no harmful side effects observed. Utilization in the adult feeding solution at the same concentrations has been equally successful.

Alberto M. Vazquez, Food and Drug Administration, Division of Microbiology Insectary, Washington, DC 20204 - We provide constant supplies of storage insects (both living and preserved) for reference material to identify whole and fragmentary insects, for life history, package invasion and pheromone attraction studies. Several rearing techniques have been developed at D-I labs and we have devised our own cultural protocols for domestic roaches; drosophilid fruit flies; tobacco moth, flat, rusty, and Turkish grain beetles; confused and red flour beetles; the lesser mealworm; dusky sap, cadelle, red legged ham, furniture, carpet, cigarette, and spider beetles; and the southern cowpea and granary weevil. This information and helpful hints are available for constructing an aspirator, separating cultures, maintaining security, handling insects volumetrically, preparing lids for culture jars, storing media, and inducing egg laying.

R. Dutton, Agricultural Products Research and Development, Dow Chemical Co., Ltd., Kings Lynn, England PE 30 2JD - I would like to hear from anyone who has successfully reared Heliothis armigera. Many thanks for your interesting newsletter.

Wm. C. Nettles, Jr., USDA-ARS-Cotton Insects Physiology Lab, 4115 Courrier Avenue, Baton Rouge, LA 70808 - I would like to obtain (alive) several species of Tachinids which are not host specific. I would prefer that they be larval parasites and that they have a short generation time.

John R. McVay, Mobay Chemical Co., Chemagro Agricultural Division, Vero Beach Laboratories, P.O. Box 2290, Vero Beach, FL 32960 - (1) I would like a source for coarse vermiculite. I am only able to locate the fine type (1/8" or smaller).

(2) I would also like a source for heavy glass ovipositor cages; large kerosene lantern chimneys or something similar would do.

H. C. Leppla, USDA-ARS, Insect Attractants and Basic Biology Laboratory, P.O. Box 14565, Gainesville, FL 32604 - (1) The initial objectives of this newsletter have been accomplished. We have identified each other, expedited cooperation, shared resources, assisted with training and employment, exchanged ideas, and shared our mutual concern for the future of insect rearing in support of contemporary pest management. In addition, sources of supplies and colonized species have been cataloged. Subjects of immediate interest that remain to be pursued systematically include identification of inquiline arthropod pests of colonies, microbial contaminants and effective treatments, and establishment of standards for materials, procedures, and products.

(2) At present, 26 articles have been committed for the USDA Technical Bulletin, "Facilities for Insect Research and Production", that Tom Ashley and I are editing. These designs are classified into two complementary chapters: Individual Units and Integrated Systems. Preliminary editorial treatment by the ARS editors was favorable and we intend to proceed with publication during the next fiscal year. Request for this bulletin may be sent to any of the authors or editors.

(3) I would like to trade two 100 lb drums of alphacil for rearing supplies of equal value.

Charlie E. Rogers, USDA-ARS-Texas Agric. Res. & Ext. Center, P.O. Box 1658, Vernon, TX 75684 - I would appreciate receiving information anyone might have on rearing scarabs.

Pritam Singh, Department of Scientific and Industrial Research, Entomology Division, Mt. Albert Research Centre, 120 Mt. Albert Road, Auckland, New Zealand - (1) I would like to mention that Bulletin No. 3 of the Entomological Society of New Zealand, "A List of Laboratory Cultures and Rearing Methods in New Zealand" is available. The 30 page booklet lists all the known laboratory colonies of insects and other arthropods in New Zealand and gives the essential details of how to rear these species in captivity. Copies are available for \$2.00 from the Entomological Society of New Zealand (Inc.), 3 Hayman Street, Te Marua, Upper Hutt, New Zealand.

(2) Because of the international response to "Frass", I suggest that coordinators should be appointed on a worldwide basis as you have done for the United States. Areas suggested are: Africa, Asia, Australasia, Canada, Europe and South America.

Merrill A. Petterson, USDA-ARS-Vegetable and Sugarbeet Insects Laboratory,
P.O. Box 1209, Mesa, Arizona 85201 - (1) I was wondering if anyone knows if
someone is studying the effects of using sodium hypochlorite and formaldehyde
simultaneously in the same lab.

(2) I would like information, regarding the effects of long term exposure
(several years) to sodium hypochlorite, especially to eyes, skin, and respira-
tory system.

Dave Nash, Department of Genetics, University of Alberta, Edmonton7, Canada -
If interested, the note "Fruit-fly Genetics in Axenic Culture" is available.
This is a compilation of the techniques, Methods and Materials of D. Nash,
E. R. Vyse, D. R. Folk, F. N. M. Haguib, and H. H. Kouni.

In the past, genetic variants have been successfully employed in nutritional
tests on several occasions. It has not, however, been common for more sophis-
ticated types of genetic analysis to be carried out in defined culture condi-
tions. This is probably due to the logistic problems involved - primarily the
requirements for handling large numbers of cultures over several successive
generations. Our experience in overcoming this problem is, quite possibly,
unique. Although we claim no special insights, this note is preferred for those
who might wish to share our techniques.

Included in the note are sections on laboratory organization, sterilization
of stocks, culture media, tests for axenic cultures, continuous culture, handling
of genetic experiments and applications.

Recently Published Articles

- Curl, G. D., P. P. Burbutis and C. P. Davis. 1975. Rearing the European corn borer, *Ostrinia nubilalis* (Hubner) on a lima bean medium. J. New York Entomol. Soc. (Dec. issue).
- Singh, P. and E. H. Jerram. 1976. Rearing housefly larvae in polythine bags. New Zealand J. of Zool. 3: 57-58.
- Brown, Harley P. 1973. Survival records for elmids beetles, with notes on laboratory rearing of various dryopoids (Coleoptera). Ent. News 84: 278-284.
- White, David S. and Daryl E. Jennings. 1973. A rearing technique for various aquatic Coleoptera. Ann. Ent. Soc. Amer. 66: 1174-1176.
- Gross, H. R. Jr., E. A. Harrell, and W. D. Perkins. 1975. *Heliothis zea*: oviposition chamber and egg collection technique for mass production. J. Econ. Entomol. 68: 630-632.
- McWilliams, J. M. and J. M. Cook. 1975. Technique for rearing the twolined spittlebug. J. Econ. Entomol. 68:421-22.
- Morrison, R. K., V. S. Hause, and R. L. Ridgway. 1975. Improved rearing units for larvae of a common green lacewing. J. Econ. Entomol. 68: 821-22.

Current Sources and Prices for Insect Rearing Supplies/July 1976

<u>Item</u>	<u>Description</u>	<u>Source</u>	<u>Cost</u>
Agar	fine	Morehead & Co. 14801 Oxnard St. Van Nuys, CA 91401 213-373-6640	\$4.97/lb in 100 lb lots or more
Alfalfa	meal	Nutrilite Products P.O. Box 93 Lakeview, CA 92353 714-521-3900	\$45.00/cwt
Aureomycin	chlorotetracycline soluable powder 64 g/lb (25.6 gm. act./6.4 oz. pkg.)	Ozark Supply Co. American Cyanamid 1614 Wyoming Kansas City, MO 816-229-6100	\$1.75/6.4 oz

Alphacel	non-nutritive, bulk	Nutritional Biochemicals, \$96.00/cwt Inc., 26201 Miles Road Cleveland, OH 44128 216-662-0212	
Ascorbic Acid		Roche Chemical Division Hoffman-LaRoche, Inc. Nutley, NJ 07110 201-235-5000	\$4.56/lb in 1-5 lb quant. \$4.31/lb in 6-10 lb quant. \$4.08/lb in 11-25 lb quant.
Calcium alginate	Kelgin HV	Kelco Co. 20 N. Wacker Drive Chicago, IL 60606 312-372-1352	\$212.00/cwt
Gelcarin	HWG	Marine Colloids, Inc. 2 Edison Place Springfield, NJ 201-379-6620	\$5.00/lb under 200 lbs \$3.75/lb in 200- 800 lb quant. \$3.25/lb in 800- 1000 lb quant. (50 lb min. odr.)
Casein	crude, 80 mesh	Milk Specialities P.O. Box 278 Dundee, IL 60118 312-426-3411	\$.68/lb 25 kg bag (55 lb)
CSM		Krause Milling Co. 4222 W. Burnham St. P.O. Box 1156 Milwaukee, WI 53215 414-272-6200	exact price unavailable
ETOH		U. S. Industrial Chem. Co., Box 7157 Louisville, KY 40207 502-426-6100	\$83.05/55 gal drum
Formaldehyde	40%	Fisher Scientific 1241 Ambassador St. Louis, MO 63132 314-991-2400	\$16.07/5 gal GSA contract \$21.40/5 gal others
KOH	45%	Fisher Scientific	\$35.24/5 gal GSA contract \$40.50/5 gal others
Linseed Oil	raw	GSA	\$30.00/5 gal

Methyl-p	Methyl-para hydroxybenzoate, technical	Tenneco Chemicals, Inc. Organics & Polymers Div. Turner Place, Box 365 Piscataway, NJ 08854 201-981-5000	\$2.40/lb in 100 lb quant. \$2.50/lb in 50 lb quant. \$2.60/lb 25 lb quant.
Pinto beans	whole	Bemhem & Co. c/o South Western Sales Assoc. P.O. Box 2948 Jacksonville, FL 32203 904-356-8535	\$19.05/cwt
Potassium Sorbate, powder	Sorbistat K	Pfizer Corp. 6460 W. Courtland St. Chicago, IL 60635 c/o J. H. Dugger, Res. Mgr. 312-331-9500	\$240.00/cwt
Salt mix (W)	Wesson	ICI Pharmaceuticals 26201 Miles Cleveland, OH 44128 216-831-3000	\$10.05/5 lb
Soy Protein	Supro 610 100 mesh	Ralston Purina Co. Checkerboard Square St. Louis, MO 63188 314-982-0111	\$.74/lb Min. 50 lb
Tenox	PG	Eastman Chemical Prod. Inc., Order Services Kingsport, TN 37662 615-246-2111	\$8.95/5 lb
Vitamin Pre-mix	#26862	Roche Chemical Div. Hoffman-LaRoche, Inc. Nutley, NJ 07110 201-235-5000	\$2.50/lb
Wheat *No longer available		H. V. Nootbaar Co. P.O. Box 2696 Capistrano Beach, CA 714-493-2676	\$.15/lb (2000 lb minimum)
Wheat germ	toasted, regular	Kretchmer Products Inter. Multifoods Corp. 1200 Multifoods Bldg. Minneapolis, MN 55402 612-340-3300	\$.50/lb

Wheat germ	raw	Niblack Foods 555 Flint St. Rochester, NY	\$39.50/cwt \$.3525/lb 2000 lb lots
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WSB (wheat soy blend)		Source unknown	
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Yeast - torula		St. Regis Paper Co. Lake States Division 603 W. Davenport St. Rhinelander, WI 54501 715-369-4100	\$.34/lb in drum \$.32/lb in bag
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Containers & Other Supplies

Cups-plastic	1 oz.	Thunderbird Container Corp. P.O. Box 12033 El Paso, TX 79012 915-584-1151	\$33.85/5000 (case)
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Lids-1 oz	paper (press in) 1.476 diam.	Standard Cap & Seal P.O. Box 80336 Chamblee, GA 30341 404-457-6332	\$20.00/10,000
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Tray	50 cell #J-2	Trend Mfg. of America 1663 E. McDuff Ave. P.O. Box 6915 Jacksonville, FL 32205 904-383-6525	\$63.15/11
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Nylar	lidding for 50 cell tray	Sandoz-Wonder Corp 18900 SW 280th St. Homestead, FL 33030 %David Shible 305-247-7875	\$127.00/r1 (4500 ft)
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Assorted paper towels		Scott Paper Co. Bob Shell, Production Manager Scott Plaza Philadelphia, PA 19113	\$17.42/30 unit case (25 cases minimum)
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Cell-Pac (CP-25)	Autoclavable holders for Thunderbird 1 oz cups	Diamond National P.O. Box 697 Phoenix, AZ 85001	\$9.64/case (400 pks/case)
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Choline Chloride	Crystals	ICH Pharmaceuticals 26201 Miles Road Cleveland, OH 44128	\$2.30/200 gm bottle
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Hexcell	Expanded resin- coated honeycomb HRH-10	Hexcell Corp 6151 W. Century Blvd. Suite 1114 Los Angeles, CA 90045 213-776-8740	
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ARTHROPOD CULTURES

Additions to the list of colonized arthropods include 26 species from eight new locations. The initial register, printed in the July 1975 newsletter, indexed 180 colonies from 31 laboratories and cited 291 (Colonies of insects USDA, ARS), 164 (Entomophagous species IOBC), 24 (List of insecticide resistant WHO), and 220 (Laboratory colonies Bull. Entomol. Soc. Can.) from other sources. In addition, 49 species and methods for rearing them are included in: Singh, P., and J. G. Charles, 1975. A list of laboratory cultures and rearing methods of terrestrial arthropods in New Zealand. Bull. 3. Entomol. Soc. New Zealand. 30 pp. These listings contain considerable duplication and some inaccuracy. Therefore, a single register eventually should be compiled. You may assist in this effort by sending a list of your colonies, including the order, genus, species, author, and common name for each entry.

Species

Location

Coleoptera

<i>Acanthoscelides obtectus</i>	37
<i>Ahasverus advena</i>	37
<i>Alphitobius diaperinus</i>	37, 39
<i>Anthonomus grandis</i>	34
<i>Anthrenus flavipes</i>	37, 39
<i>Araecerus fasciculatus</i>	37
<i>Attagenus megatoma</i>	37, 39
<i>Callosobruchus maculatus</i>	37, 39
<i>Cryptolestes ferrugineus</i>	37
<i>Cryptolestes pusillus</i>	37, 39
<i>Cryptolestes turcicus</i>	37
<i>Cylas formicarius</i>	38
<i>Cynaesus angustus</i>	37
<i>Dermestes maculatus</i>	39
<i>Gibbium psylloids</i>	37
<i>Gnathocerus cornutus</i>	37
<i>Lasioderma serricorne</i>	37, 38, 39
<i>Liptinotarsa decemlineata</i>	34
<i>Lophocateres pusillus</i>	37
<i>Necrobia rufipes</i>	37
<i>Oryctes rhinoceros</i>	35
<i>Oryzaephilus mercator</i>	39
<i>Oryzaephilus surinamensis</i>	37, 39
<i>Palorus ratzeburgi</i>	37
<i>Rhyzopertha dominica</i>	37, 39
<i>Sitophilus granarius</i>	37, 39
<i>Sitophilus oryzae</i>	37, 38, 39
<i>Sitophilus zeamais</i>	39
<i>Stegobium paniceum</i>	37
<i>Tenebrio molitor</i>	37, 38,
<i>Tenebrio obscurus</i>	37
<i>Tenebroides mauritanicus</i>	37, 39

SpeciesLocation

Coleoptera (continued)

<i>Tribolium andax</i>	37
<i>Tribolium castaneum</i>	37, 38, 39
<i>Tribolium confusum</i>	37, 39
<i>Tribolium destructor</i>	37
<i>Trogoderma glabrum</i>	39
<i>Trogoderma granarium</i>	38
<i>Trogoderma inclusum</i>	37, 39
<i>Trogoderma parabile</i>	39
<i>Trogoderma variabile</i>	37

Diptera

<i>Cochliomyia hominivorax</i>	34
<i>Musca domestica</i>	34
<i>Stomoxys calcitrans</i>	34, 36

Hemiptera

<i>Leptoglossus corculus</i>	32
<i>Leptoglossus phyllopus</i>	32
<i>Pangaeus bilineatus</i>	33

Lepidoptera

<i>Anagasta kuehniella</i>	34, 39
<i>Cadra cautella</i>	38, 39
<i>Cadra figulilella</i>	39
<i>Elasmopalpus lignosellus</i>	33
<i>Ephestia elutella</i>	39
<i>Ephestia kuehniella</i>	37
<i>Heliothis zea</i>	34
<i>Laspeyresia pomonella</i>	34
<i>Manduca sexta</i>	34
<i>Paramyelois transitella</i>	38
<i>Pectinophora gossypiella</i>	34
<i>Plodia interpunctella</i>	37, 38, 39
<i>Sitotroga cerealella</i>	38, 39
<i>Tineola bisselliella</i>	39

Orthoptera

<i>Leucophaea maderae</i>	34
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