
**Growth and Maturation
of the NWFP Agricultural University Library**

Jane S. Johnson
Information Consultant
University of Illinois



**Office of International Agriculture
University of Illinois at Urbana-Champaign**

**In collaboration with
Southern Illinois University at Carbondale**

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Report of the Consultant's Trip
January 31-February 27, 1990

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Summary

Library Progress

The progress which has been made in the Northwest Frontier Province Agricultural University Library during the last six months is remarkable by any standards. Mr. Attaullah has taken an active leadership role and increased the capabilities of both professional and support staff through intensive and thoughtful training. Various responsibilities have been delegated to the different librarians. The results show not only an increase in productivity, but also a change in attitude which reflects pride and the desire to perform quality work.

Mr. Attaullah and the information consultant have written a paper documenting the modernization of the AU Library which was accepted for presentation at an international congress to be held in Budapest, Hungary the end of May. It is unfortunate that, to date, we have been unable to obtain funding for him from either the university or the project to attend the conference to present the paper. All areas for possible funding will continue to be explored, but this opportunity may soon be lost for him.

Publications from Databases

During the same period there has been notable progress in adding records to the library's computerized database. The establishment of efficient routines and the delegation of responsibilities among staff has eliminated the duplication of efforts which was so prevalent in the past. The librarian in charge of serials worked diligently to inventory the holdings of all journals held in the library. These combined efforts provided the foundation for the preparation of the library's first two publications during the consultant's visit: (1) *AULIB Database Manual*, by Attaullah and Jane S. Johnson, and (2) *Directory of Serials in the NWFP Agricultural University Library*, compiled by Naeemullah Khan and Attaullah. The publications are presented in Annexes 1 and 2 of this report.

Coordination with Other Units within the AU System

During the consultancy, concern was raised over the compatibility of the systems in the NWFP AU Library and those in the library of the Institute of Development Studies (IDS). The consultant and Mr. Attaullah worked closely with the IDS Librarian and his new assistant librarian to better understand the system and to utilize it to meet their unique needs while maintaining compatibility. Both IDS librarians were very responsive to the training to prepare high quality input and seemed to have renewed enthusiasm for their work as they learned to use the computerized system to better serve IDS staff needs.

Discussions were held regarding extending library services to the agricultural research institutes within the province. The general attitude

towards circulation of library materials requires some change before any cooperative efforts are possible since loaning materials has historically been all take out and no return. In addition to the attitude change, a viable delivery system needs to be established in order to facilitate distribution of library materials among the various research centers and the university. Both of these questions will require action from the university administration as well as from the library.

OSIRIS Software Implementation

In addition to working with the library, the information consultant worked with Dr. Edington to begin implementation of the OSIRIS administrative program for student records and class scheduling. A start was made in the right direction by installing the system on the computer in Dr. Edington's office and training one clerk from the Director of Teaching's office to enter data on students enrolled at the university. An increased level of commitment from the Director of Teaching will be required for this system to be successfully implemented. A professional staff member must be designated responsible for the system and the information which can be provided from it; a clerk may enter data, but simply does not have the authority to make the necessary decisions to keep the system functional. Dr. Edington will continue to address the problems which make it difficult to complete implementation and utilize the system.

Computer Support

A concern which surfaced during the consultant's visit was the presence of a computer virus on the majority of the machines at the university. The consultant had brought with her a disk which identified the presence of the virus. With backstopping assistance from Dr. Sam H. Johnson III from the University of Illinois, a disk with the appropriate anti-virus program was received from Urbana in three-days time. The consultant then worked with various staff including those in the computer laboratory to remove the virus from their machines.

As the age and use of the microcomputers increases, it is evident that there is a clear need for a strong unit at the university to provide backstopping both with computer hardware and software. Technicians need to be trained to troubleshoot hardware problems and maintain equipment. Informal software support among advanced users is increasing, but neither the librarian nor individual professors have sufficient time to bear the burden of training their colleagues to use various software packages. Some software support staff must be provided by the university to meet the ever-increasing training and backstopping needs of faculty.

Coordination with PARC and USAID

The NWFP AU Librarian has maintained close contacts with the documentalist and librarian at the Pakistan Agricultural Research Council located at the National Agricultural Research Centre. PARC utilizes the same software as the NWFP AU Library for its database of information on agricultural research publications and journal literature from and about Pakistan agriculture. Thus, it is feasible to share databases between organizations. At present, the two organizations are trying to formalize the exchange of their databases through appropriate administrative channels.

The information consultant also met with Ms. Kathy Norris at USAID who is coordinating the purchase of computer hardware and software for other agricultural universities and research institutes in Pakistan. The consultant suggested a way in which the computerized database resources at PARC could be shared via the new equipment with a minimal amount of training.

Future Activities

Emphasis during the coming months will be placed on increasing the number of titles represented in the library's database. As both the quantity and quality increase, the librarians will endeavor to provide enhanced retrieval services to meet faculty and students needs. When the addition of older titles to the database nears completion, there are plans to prepare a book catalogue for distribution to departments and agricultural research institutes associated with the university.

There is continual interest in sharing library resources between the university and agricultural research institutes within the province. Once computers and appropriate software are available at the research institutes, the librarians could learn to search the AU Library's database with a minimal amount of training. However, the obstacles which presently deter the physical transfer between libraries need to be addressed by a group which includes the librarian, university administration, and institute directors.

Initial steps to implement the OSIRIS administrative database system were taken during this consultancy. A systematic schedule for completing the process needs to be designed and implemented

The registrar and his administrative assistant also expressed their desire to establish a database to track personnel at the University. Preparing reports, pay slips, etc. is extremely repetitive and time consuming and lends itself to more efficient management via a computerized database.

There is an increasing need for staff training in desktop publishing. With laser printers now available on campus, those who wish to prepare high quality output, but do not know how to prepare the files, place an excessive load on those who are proficient with these advanced software capabilities to assist them to format and print their materials. With some training in the advanced features of word processing software to address the laser printer capabilities and installation of necessary drivers on selected machines around the university, a larger group of competent users will be established and pressure on those professionals who have been willing to date to assist their colleagues will decrease.

Itinerary

January 31	-	Depart Champaign
February 2	-	Arrive Peshawar PM
February 3-24	-	Work at NWFP-AU Library
February 25	-	Travel to Islamabad, meet with USAID and PARC officials
February 26	-	Depart Islamabad
February 27	-	Arrive Champaign

Purpose

The terms of reference for this trip are listed below. These are a revised subset of activities from the terms of reference for the entire period of the consultancy and reflect the progress which has been made in the library during the past year.

1. Assuming that good progress has been made in putting records for older titles in the NWFP-AU Library collection, prepare a book catalogue with extensive author, title and subject indexes of materials available in the library. Make arrangements for the catalogue to be printed and distributed to departments, research stations, and for use in the library.
2. Establish computerized check-in system for journal issues from completed inventory of serials carried out by library staff. Prepare printed list of serials in the NWFP-AU Library for distribution to faculty, researchers, and other agricultural libraries.
3. Work with selected administrative staff to begin implementation of OSIRIS administrative database management system. Information on faculty, staff and students enrolled at NWFP-AU from this system is required to implement the library's computerized circulation system.
4. Expand services offered to faculty and students including selective dissemination of information (SDI) and on-demand searches.
5. Provide additional training to library staff in advanced strategies for on-line searching of library databases, emphasizing how the quality of data input affects their ability to accurately retrieve information.
6. Review prospects of obtaining agricultural databases on CD-ROM to enhance searching capabilities of journal articles and aid in subject cataloguing.

Activities

Library Progress During Past Six Months

In the report of the information consultant's visit July 1-25, 1989¹, it was stressed that the library staff had the technical expertise to efficiently perform their duties. What was missing at that time was personal commitment on the part of each staff member to prepare accurate information for the system and to provide quality retrieval services for faculty and students. Productivity needed to be increased in order to build up databases which reflect the variety of materials available in the library. Administrative support was required to provide equipment so that services which had been suspended could be reinstated. Finally, it was stressed that the librarian could not function effectively in his present status to provide the input required to integrate the library into the teaching and research functions of the university.

It was evident when the consultant returned in early February, 1990, that the librarian staff as well as the university administration had implemented measures which dealt successfully with each of the recommendations. The change was most impressive when the consultant entered the library and saw all staff members engaged in their work. For the first time since the information consultant had been involved with the library, no one was standing around waiting to be told what to do; rather, each person seemed to know what needed to be done and was doing it. Within a few hours, it became clear how this great change had come about.

During the past six months, Mr. Attaullah has spent time in increasing the capabilities of each librarian. He has delegated responsibilities for various aspects of library processing and services to individual librarians. Staff have responded by accepting the responsibilities and showing pride in the quality of their work. Mr. Shakirullah has been assigned responsibilities for accessioning books coming into the library and providing descriptive cataloguing for new titles. Mr. Rahim, a newly hired librarian, is in charge of acquisitions and data entry. Mr. Naeemullah is responsible for maintaining the journal collection which includes acquisitions, check-in, claiming and cataloguing of new serial titles. Mr. Ali Khan is refining the circulation system whereby the library will eventually be able to pinpoint the status of individual titles. Mr. Jannat, who is presently on study leave at the University of Peshawar, supervises the library during the extended evening hours and assists each of the other librarians on specific tasks. Mr. Attaullah, besides overall management of the library, is responsible for maintaining consistency in the classification of books and in assigning subject terms to titles.

Mr. Attaullah has set the atmosphere in the library whereby everyone feels free to contribute and to make suggestions for improvements. The processes are definitely dynamic in that they are continually being refined for efficiency and to better meet the needs of faculty and students. As each librarian executes his tasks, he has gained experience in working with the computerized system. This experience translates directly into providing more and better service for users of the library. One of the supplementary benefits enhanced services is that both students and faculty show more respect in their interactions with library staff.

As a result of the intensive training and close supervision provided to each librarian by Mr. Attaullah, the number of materials which are processed in a month's time has increased

¹ *Consultant Report - Jane S. Johnson, Library and Information Specialist, July 1-25, 1989.* Urbana, Illinois: Office of International Agriculture, University of Illinois at Urbana-Champaign, August 1989. 14 pp.

significantly. With systems running relatively smoothly, approximately 100-150 titles are being added to the database each month. At this rate, data entry of older titles should be completed within a year so that a book catalogue may be prepared.

During this same period, the university administration demonstrated its support for the library. A new photocopy machine was purchased to replace the library's machine which had been turned over to a student group during the spring of 1989. Progress was made in the promotion process to upgrade the librarian from grade 17. During the consultant's visit, Mr. Attaullah was interviewed by the personnel review board to move to Grade 18. Certainly, this is a step in the right direction for the librarian to be able to interact with department chairmen, deans, and administration on the expanded role of the library in teaching and research at the university.

Last July, Mr. Attaullah and the information consultant submitted a paper for presentation at the *8th World Congress of the International Association of Agricultural Librarians and Documentalists* to be held in Budapest, Hungary on 28-31 May, 1990. The paper documents the remarkable progress which has been made at the AU Library during the last two years. Notification that the paper had been accepted was received in December, 1989 and Mr. Attaullah approached the TIPAN Project Team Leader and the Vice Chancellor of the University to assist him in locating funding to attend the conference to present the paper. Unfortunately, neither the project nor the university has been able to provide such funding. Mr. Attaullah wrote a proposal to the University Grants Commission (UGC) but has not yet received a reply. Historically, the UGC tends to provide only partial funding if any is given. He has also explored funding possibilities through the Dutch Embassy in Islamabad. The information consultant has submitted a request to the Head of the Library Division at the U.S. Information Agency in Washington, D.C. It will be a loss for both Mr. Attaullah and the University if lack of funding prevents his attendance at this congress which is convened only every four years.

Library Publications from Databases

Due to the commendable efforts of all the library staff, the quality and quantity of records in the various library databases has increased considerably. Each librarian has been diligently following the standards established for data entry. When errors are detected, special notes are written for Mr. Attaullah to examine and modify the record. Everyone is actively involved in the integrity of the database and is aware of how errors affect retrieval of information. During this consultant visit, the draft data entry manual was modified and updated with numerous examples gleaned from experiences with the system. The result was the printing of the library's first publication, *AULIB Database Manual* by Mr. Attaullah and Ms. Jane S. Johnson. (See Annex 1.) This manual provides the basis for maintaining consistency in the database by adhering to strict standards. This publication will immediately be used by the IDS librarians as they strive to maintain the same standards for records added to their database. The manual will also be valuable for other librarians in Pakistan who are contemplating setting up microcomputer-based systems.

During this consultant visit, Mr. Naemullah, librarian in charge of serials, completed the inventory of serial holdings in the library. The consultant then worked with Mr. Naemullah to edit records for consistency and completeness. When this process was completed, the consultant and Mr. Attaullah prepared output formats and procedures to produce a directory of serial holdings for distribution to departments and research institutes. This publication, *Directory of Serials in the NWFP Agricultural University Library* by Naemullah Khan and Attaullah, is presented in Annex 2 of this report. This directory represents a milestone in the library's ability to identify missing

volumes of journals. The library may now actively strive to complete the holdings of the more important journals either through purchase or gifts. In addition, the directory will be distributed to agricultural research institutes in the province and agricultural libraries throughout Pakistan to aid researchers in locating needed materials.

In preparing these two publications, the consultant had the opportunity to train Mr. Attaullah to use some of the advanced features of the word processing software and font capabilities of the laser printer. Only one or two other faculty members are skilled at preparing files which access the typeset quality fonts which set the laser printer far apart from the 9-pin dot matrix printers available elsewhere on campus.

In December, 1989 the consultant sent the librarian information on bibliographic databases with an agricultural emphasis that are now available on CD-ROM (compact disk). These would provide access to journal articles, individual articles in proceedings and collected works and monographs. Mr. Attaullah initiated an order which has been approved to purchase the National Agricultural Library's AGRICOLA database, OCLC's Agriculture Library of 400,000 monographic records, and the CAB database. These should provide excellent access to current agricultural literature. In addition, the OCLC Agriculture Library will be an excellent resource for librarians to provide more accurate subject access to the AU Library's collection.

As the cataloguing of older titles nears completion, there are plans to publish a catalogue of books available in the library with author, title, and subject indexes. Distribution of this catalogue will greatly facilitate the development of interlibrary cooperation among libraries within the university system.

Coordination with Other Units in the AU System

Institute of Development Studies

During an informal conversation between the information consultant and Dr. Nurul Islam Mian, mutual concern was raised over the compatibility of the computerized system used by the Institute of Development Studies Library with that of the Agricultural University Library. Dr. Mian coordinated efforts to provide additional training to Mr. Faridullah, IDS librarian, and Mr. Inayatullah, his assistant. Mr. Faridullah had received basic level training in the computerized system in 1989, but due to highly fluctuating electricity supply in the IDS library and staff changes he had been unable to work effectively on the computerized system.

The consultant assisted Mr. Faridullah to reinstall both word processing and database management software on his computer along with records which had been input over a year ago from his collection. The IDS computer setup is now completely compatible with that in the AU Library so that databases may be shared and updated regularly with ease. The IDS Library still needs to purchase an uninterrupted power supply (UPS) to provide backup power for 10 to 20 minutes so files may be properly closed before exiting out of the program. Without the UPS, an inordinate amount of time is spent reloading the database. This time could be more productively spent adding new records to the database if IDS had a UPS.

The consultant worked with the two IDS librarians to better understand the standards for data entry and how inaccurate data entry affects the successful retrieval of records. Additional time was spent reviewing subject terms which had previously been assigned to books. Stress was placed on providing specific terms where applicable rather than broader terms such as "Economics" since

the majority of books in the collection are on various aspects of economics. Since the computerized catalogue provides numerous access points not available in a traditional card catalogue, the librarians needed to alter the manner in which they approached cataloguing materials. After editing 100 records, they seemed to comprehend the concepts which would provide the best possible opportunity for successful retrieval in the computerized system. The consultant also showed the librarians how to utilize the computerized catalogue to avoid duplication and maintain consistency in both classifying and assigning subject terms to new books. Both librarians were diligent in working with the consultant. Mr. Faridullah returned to the library several days after regular office hours to be able to gain experience in using the system without the frequent interruptions which are a part of daily work on campus. Both librarians seem quite keen and should be able to build up the database of IDS holdings relatively quickly. It is most important, however, that they continue to interact often with the AU librarians who can provide both technical and moral support for their endeavors.

Interlibrary Cooperation within the University System

During discussions with the Vice Chancellor and TIPAN Team Leader, the question of interlibrary lending between the AU Library and those libraries at the provincial agricultural research institutes surfaced. In theory, everyone agrees that such a system should be developed. In reality, there are some major obstacles which must be addressed before an interlibrary loan system may be successfully implemented.

One such obstacle is the attitude professors, researchers, and students presently have concerning the circulation of library materials. Presently, users are allowed to borrow books with no mention of a date by which the books are to be returned for circulation to other borrowers. Thus, borrowers may view book circulation as a right rather than a privilege. Very often, when a student or professor leaves the university, he finds that he has borrowed several books for which he can no longer account. Thus, replacement costs are levied often generating hard feelings on both sides. The AU Library must first try to modify circulation procedures on campus and attain some level of success with the new system before they will be willing to allow materials to go off campus. Because of poor cooperation in returning library books, the library regularly purchases multiple copies of books so that the first copy will remain available in the non-circulating "Reference" collection. This less-than-efficient usage of scarce resources for purchasing books has been precipitated by years of no limits being placed on the amount of time a borrower may keep materials and will not be changed overnight. However, steps can be taken now to gradually change the circulation process and, eventually, borrowers' attitudes.

The other main constraint to implementing an interlibrary loan system is the total absence of a reliable distribution system between the university and outlying research institutes. Everyone concedes that sending books through regular mail channels is not a viable alternative. At this point, there does not appear to be any other options. A viable and dependable delivery system needs to be established among the institutions within the system before the physical sharing of library resources can become a reality.

In order to solve these underlying obstacles to the implementation of a successfully interlibrary loan system, action will be required from the university administration and institute directors as well as from the librarians. Without the administrative support, it would be extremely difficult for the AU Library and the libraries at different research institutes to enforce new procedures required to operate a cooperative system.

Although there are difficulties in to be overcome, there are some activities which may be started in the near future which will effectively serve as a catalyst to increase the demand for

researchers to have access to resources available in the AU Library. For those research institutes which have librarians on their staff and computers available to them at their institutes, some training sessions could be planned to teach the librarians how to search the AU Library database using SearchMagic, a software package designed to provide menu-driven search capabilities for INMAGIC databases. The database and search software could then be installed on the computer at the research institute. The demand created by being able to more easily locate relevant research materials might supply the catalyst to more quickly find solutions to the problems which prevent interlibrary loan within the university system.

OSIRIS Software Implementation

In July 1989, the information consultant hand-carried an administrative software package, OSIRIS, which had been ordered to computerize student records and class scheduling. Discussions were held during that trip with respect to the information that was required in order to implement the system. Data needed for the system included information on faculty, students, university courses, class sections offered each semester, and a calendar for teaching days, holidays, etc. during the year. None of the information was readily available in July.

During December 1989, the information consultant worked with Mr. Asrar, former NWFU AU Registrar on study leave at the University of Illinois, to determine what information would be required by the University that was not built in to the OSIRIS system. A packet describing the various databases in the OSIRIS package was developed by the information consultant. Mr. Asrar was returning to Pakistan to collect data for his thesis and was willing to gather some sample information sheets which are completed by students and faculty at the university.

The same packet of materials was shared with Dr. Edington and Dr. Hafeez, Director of Teaching. In particular, the Director of Teaching's Office was responsible for defining course and class section information which is required by the OSIRIS system. This office also appeared to be the most likely to be able to supply the names of faculty members teaching each section.

Upon the information consultant's arrival in early February, Mr. Asrar provided copies of first-year student information application forms as samples for setting up the system. A copy of the newly published student handbook provided information on most courses taught at the university. Some additional work was required on the course information as some of the courses showed no departmental designation or course number. A list of the teaching faculty was obtained from the TIPAN Office. With these various bits of information, the consultant began to input data into the various OSIRIS databases.

Dr. Edington and the information consultant met with the Registrar to gain his assistance in implementing the system. It was found that the Registrar's Office maintains data mainly on faculty and staff in the university system, perhaps equivalent to a personnel office in a U.S. institution. Although the OSIRIS system is not designed to maintain the type of information required by the Registrar's Office, it was determined that the data maintained in that office was a natural for computerization. The Registrar and his assistant expressed a strong desire to establish a system to meet their needs and improve their ability to provide the information required of them on a more timely basis and with less duplication of effort.

After Dr. Edington and the information consultant met with the Director of Teaching, it became very apparent that the OSIRIS package could satisfy many of the information needs of that

office. In particular, student records and transcripts, class scheduling, class lists for teachers, etc. were all major functions of the OSIRIS system. The consultant stressed that, in order to implement such a system, there needed to be a professional staff member assigned responsibility for the system.

The information consultant installed the OSIRIS software on the computer in the Director of Teaching's Office. Although the computer worked the day the software was installed, it would not access the hard disk the next day. The typist explained that the computer had been undependable for quite a while and that EGS had suggested they purchase a new hard disk. Obviously, very little productive work can be completed on that computer in its present state. In order to provide some training for data entry of student records, the information consultant was forced to install the OSIRIS program on the computer in Dr. Edington's office.

In order to get started, one of Dr. Hafeez's clerks was assigned to learn how to enter student data into the system. A meeting time was set up for the consultant to train the clerk to enter the student data. The clerk did not show up for the meeting. Again, another meeting was scheduled. This time the clerk did not appear because he took leave. The last day of the consultant's visit, Dr. Edington and the typist from Dr. Hafeez's office were shown how to enter data for students. Backup procedures were established to prevent the loss of data. However, it is clear that computerization of student data will never be successful until the Director of Teaching exhibits his commitment to the work by assigning competent and dependable staff to complete the tasks involved. Building up computerized systems is not just a matter of data entry. It requires thought and decision making to maintain the integrity of the system. Professional staff responsible for the information must become proficient in using the system themselves before they can satisfactorily supervise clerical staff to enter data and maintain the system.

Although very elementary training in data entry was begun during this visit, there remains much to be done before the OSIRIS system will be fully functional. Of primary importance is the Agricultural University exhibiting its commitment to upgrading its systems for maintaining student records and class scheduling by assigning responsibility for the system to the appropriate person who is capable of making decisions and sustaining accuracy and integrity in the system. When such a person has been designated, then further training in using the system will likely succeed.

Computer Support

During the last year at the University of Illinois there has been an increase in the number of viruses infecting microcomputers. These same viruses have been spread extensively in developing countries where much of the software used is pirated. The information consultant brought from Illinois a software program which detects virus infections on disks. When this program was run on the three computers in the library, it was found that the computer on which the master catalogue database resides had been infected. This is the same computer that is connected to the laser printer. Since the laser printer was installed in July 1989, several faculty members have enlisted the aid of Mr. Attaullah to print out important materials on this high quality printer. The virus was introduced to the hard disk of this computer from an outside disk. The consultant telexed Dr. Sam Johnson at the University of Illinois who obtained a copy of the appropriate anti-virus program from the U of I Computer Services Center and sent it off to Peshawar via Ahmad Khan who was leaving for Peshawar the next day. The disk was delivered to the consultant within three days and the virus was successfully removed from the infected disks. The consultant worked with Mr. Attaullah to set up a procedure to check disks coming from the outside for viruses before

allowing them to be used on the library's computers. This same procedure was extended to the managers of the computer laboratory who had found that all of their machines had been infected as well.²

The above incident brought to the consultant's attention another concern which will continue to expand unless steps are taken to alleviate it. Presently the library has the only laser printer installed at the university. Mr. Attaullah is gaining experience daily in how to better utilize the vast capabilities of this printer. As other faculty see the quality print available from this machine, they too wish to be able to print their materials with the same quality. Mr. Attaullah has been willing to accommodate as many requests as possible. However, there are skills involved in using WordPerfect 5.0 to access these advanced printer capabilities. Most persons who use word processing at the University have not been properly trained to prepare documents which can directly access the typeset font capabilities of the laser printer. Consequently, Mr. Attaullah has been asked to help format the files before printing. This is often a very time consuming process. For those faculty members who know how to format files with typeset fonts, the appropriate printer driver was installed on their computers so they could prepare files which could be printed directly from disk, requiring a minimum amount of the librarian's time. Faculty and staff need to have access to training for using some of the advanced features of WordPerfect 5.0 and utilizing the various typeset quality fonts available on that printer.

During each of the consultant's visits to the Agricultural University, interest has remained high to upgrade systems and routines through use of microcomputers. Through the TIPAN project a considerable amount has been spent on the procurement of microcomputer equipment. What is increasingly evident is that training to effectively utilize and maintain the computers has not kept pace with the purchase of equipment. Although there has been a costly maintenance agreement with EGS, it is not clear that the agreement has been properly administered when so many machines have disk drives that do not and have not worked properly for quite a long time. If the University is truly committed to utilizing computer technology in research, teaching, and administration, then some steps need to be taken to assure that the microcomputers will have a life after the end of the project.

The Agricultural University must realize, as U.S. universities have finally figured out, that introducing new technology requires creating new positions designed for technical staff to provide backstopping for both hardware and software. The University has an excellent start in this direction with the exemplary computer laboratory which has been successfully teaching students to use microcomputers. However, this lab as it is now staffed cannot supply the ever increasing amount of training required by faculty to upgrade their skills to utilize computers for research, teaching and publication. Backstopping is needed for software installation and utilization. Support staff are also required who are capable of troubleshooting technical problems with equipment across the campus and can exchange boards and disk drives to keep equipment functional. Problems will continue to mount until the university administration addresses the necessity for adequate computer support.

² This same type procedure has been found necessary for all student microcomputer labs on major U.S. university campuses in order to keep viruses from student disks from infecting university equipment.

Coordination with PARC and USAID

The AU Librarian has maintained close contact with the Information and Documentation Section at the Pakistan Agricultural Research Council (PARC). In November, Mr. Attaullah was invited to present a paper at the Workshop on Modern Library Methods and Technologies held at PARC. Many librarians who attended were very interested in developments at both the NWFP AU Library and PARC since both have utilized the same software (INMAGIC) in establishing their systems. Mr. Attaullah is in the process of obtaining a copy of PARC's 12,000 record database which indexes agricultural publications produced in Pakistan. This would provide the AU Library with an excellent resource for researchers to easily locate materials relevant to Pakistan agriculture. The system at present requires that the request for the database come from the Vice Chancellor of the University to the Directory of PARC. It is hoped that this process will be completed quickly to facilitate better access to agricultural information in the Northwest Frontier.

While the consultant was in Islamabad, she met with Ms. Kathy Norris at USAID who is coordinating the purchase of computer hardware and software for the other agricultural universities and research institutes in Pakistan. Again, the question of resource sharing among the agricultural libraries surfaced. Although it is not possible to provide adequate training for librarians to implement complete computerized systems in the short run, the consultant suggested one way in which computerized database resources could be shared with a minimal amount of training. The software company which markets the database management software used at both PARC and the AU Library in creating their databases has recently released a package called SearchMagic. This software is designed to facilitate successful searching of INMAGIC databases with a minimal amount of training. With PARC's training mandate, librarians at participating institutions could receive sufficient instruction over a two- to three-day period to be able to utilize the system on their own machines. In addition to the training, however, it might be necessary for a PARC representative to assist each participant install the system on a machine at their institution since this is not usually an easy task for the computer novice.

Conclusions and Recommendations

In general, this consultancy trip was most rewarding. The progress which has been made in the AU Library is quite impressive. Not only has the productivity of staff increased, but the attitude of the librarians has matured greatly. They appear to have renewed interest in their work and take pride in being able to better serve faculty and students. Their work is by no means complete but their contribution to the educational process seems to be well-received and mutual respect permeates the library's atmosphere as library staff interact with faculty and students. It is very pleasant to see each staff member's self-confidence level rise as they assimilate new skills which better equip them to provide high-level service in this new information age.

It is important that library staff maintain or increase their present level of productivity. The sooner older titles are added to the cataloguing database, the sooner a book catalogue may be produced and distributed to departments and outlying research institutions to facilitate their access to information available in the library.

As stated in the section *Coordination with Other Units in the AU System*, the librarian, University administration, and institute directors should attempt to work out a means to alleviate

the obstacles which inhibit the sharing of information resources among agricultural institutions within the Northwest Frontier Province.

The librarians at the IDS Library have taken a major step in building up a high quality database of their collection which conforms to the standards set by the AU Library. The IDS administration must recognize that computerization of the collection is an on-going process and should be measured in quality as well as quantity. The librarians should be encouraged to maintain a close working relationship with the librarians in the AU Library and regularly share updated copies of their respective databases to better serve users.

Much work remains before implementation of the OSIRIS system will be completed. Data on all students at the University needs to be entered. A professional level staff member should be assigned responsibility for maintaining the system and the integrity of the data in the system before further training is planned.

Several concerns regarding computer support have been raised. The most pressing issue which directly affects the librarian is the need for further training for faculty in the use of advanced features of WordPerfect 5.0. This will alleviate some of the burden which has fallen on him to assist colleagues to use the unique attributes of the laser printer connected to the library computer.

Future Activities

1. *Prepare Book Catalogue*

Although much progress has been made to date in development of computerized systems in the library, there still remains some areas where work has not been completed. We are still striving to complete data entry for the majority of titles in the AU Library collection so that a book catalogue may be published and widely distributed to assist researchers to locate resources in their specific fields.

2. *Install CD-ROM Drives and Train Librarians to Search Databases*

The order for the CD-ROM databases and equipment should be sent first to the University of Illinois so the information consultant can make certain the systems are complete before shipping them to Peshawar. When the equipment and disks arrive in Peshawar, arrangements should be made for the consultant to assist with the installation and training of the librarians to effectively use the databases.

3. *Interlibrary Cooperation*

In the area of resource sharing between the university and research institutes, plans should be made to conduct a training course for librarians from the research institutes to learn to search the AU Library database using SearchMagic. Assistance may also be provided for installation of the software and database on the computers at the librarian's respective institutes. Additional training could be planned for these same participants to learn how to complete worksheets for resources at their libraries to be added to the database.

4. *Continuation of Training and Implementation of OSIRIS System*

Additional training is required to fully implement the OSIRIS system. A realistic schedule for this training should be planned in close coordination with the Director of Teaching's Office.

5. *Assist Registrar's Office to Computerize Systems*

Every effort should be made to assist the Registrar to computerize some of the information for which he is responsible. The Registrar and his assistant have expressed their commitment to developing a database to be able to respond more quickly to requests for information. A database should be designed which is initially not too complicated, but which could be expanded to meet future needs as staff gain experience and self-confidence in working with the system.

6. *Advanced WordPerfect Training for Faculty and Staff*

Some workshops on utilizing advanced features of word processing and learning to format files for output on laser printers should be conducted on campus for faculty who have become proficient with basic word processing concepts. These workshops should increase the cadre of skilled users who can provide informal support for their colleagues.

Annex 1

AULIB Database Manual

Attullah

Librarian

NWFP Agricultural University

Jane S. Johnson

Information Consultant

TIPAN Project

University of Illinois



Library

Northwest Frontier Province Agricultural University

Peshawar, Pakistan

February 1990

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AULIB Database Manual

Introduction

In June 1988, the authors began the process of designing and implementing computerized information storage and retrieval systems for library activities at the Northwest Frontier Province Agricultural University (NWFP AU) in Peshawar, Pakistan. INMAGIC¹ was the database software selected for use due to its flexibility and built-in features which readily support the unique requirements of a bibliographic information system. However, most data is entered using WordPerfect² and then transferred to INMAGIC using the batch add capabilities of the program.

This manual documents the standards for data input into the AULIB database which are required for successful retrieval of the information for faculty, students, and researchers. Standards for all types of materials (i.e., monographs, serials, journal articles, and analytics) are presented with examples. What information is to be entered into each field and the format for entry is described and illustrated.

Since data is moved back and forth between the two software programs, several appendices are included to document the various processes for adding to and maintaining the database. These include an explanation of the data structure, procedures for data entry using WordPerfect, procedures for transferring files created in WordPerfect to the AULIB Database in INMAGIC, and various output formats for printing search results and preparing periodic lists of acquisitions.

Standards for Typing and Punctuation

Since the AULIB database will be used to produce several outputs (i.e., book catalogue, accessions lists, etc.), it is extremely important that data be typed following standards acceptable in published materials. This will decrease the time required for editing each output.

In general, the following standards should be adhered to when typing any bibliographic information to be added to the database. Standards specific to an individual field will be described with the section on that field.

1. Colons (:), semi-colons (;), and commas (,) are to be followed by a single space.
2. Full stops (.) are to be followed by two spaces. There are two exceptions to this: (1) When the full stop is used for an abbreviation rather than the end of a sentence, follow it with a single space. (2) When the full stop is the end of a field, no succeeding spaces are necessary.
3. Enter end punctuation only in those fields where full sentences are entered (i.e., note, abstract, etc.). However, if a field ends in a full stop because of an abbreviation, enter the full stop.

¹ Inmagic Inc., 2067 Massachusetts Avenue, Cambridge, MA 02140-1338, USA

² WordPerfect Corporation, 1555 N. Technology Way, Orem, Utah 84057, USA

NO	Accession Number	Non-repeatable	Required
----	------------------	----------------	----------

This is the number by which the record will be retrieved, identified or known in the database. The number must be unique for each record. Enter the accession number for the monograph. If there are multiple copies of the title, enter the first accession number in this field and indicate the remaining accession numbers in the COP (Copies) field. Unique numbers will need to be assigned for serial and journal article records since a true accession number does not exist for these documents. The NO for analytic records may be created by using the accession number of the monograph of which it is a part followed by the number of the chapter or paper, i.e. NO 48602-3 -- 3rd analysed paper in monograph NO 48602.

NO	83295	Monograph
NO	23810	Monograph with multiple copies
COP	23810-23829, c.1-20 <i>not</i> 23810-29, c.1-20	
NO	s 186	Serial
NO	23810-4	Analytic

If the accession number is preceded or succeeded by a letter of the alphabet, enter the letter either followed by or preceded by a space, not a dash (-). This space is necessary so that the numbers will sort correctly in INMAGIC.

NO	d 5838	AU Library, Donated book
NO	tp 512	AU Library, TIPAN donated book
NO	46213	AU Library, Purchased book
NO	o 168	AU Library, Oriental book
NO	6388 p	IDS, Purchased book
NO	4832 f	IDS, Free book

DA	Date Input	Non-repeatable	Required
----	------------	----------------	----------

Enter the date the record is added to the database. The date should include only the abbreviation of the month and the year. *Do not use a comma (,) to separate the month from the year.*

DA	Oct. 1988
DA	Dec. 1988

-20-

PE	Person Entering Data	Non-repeatable	Required
-----------	-----------------------------	-----------------------	-----------------

Enter the initials of the person who entered the record into the database. The initials should be entered in lowercase letters.

PE	ak
PE	rd
PE	ij
PE	sj
PE	fs

EN	Entry Number	Non-repeatable	Required
-----------	---------------------	-----------------------	-----------------

This field is reserved for adding entry numbers to records when a printed bibliography is prepared. Do not use this field at the time of original data input.

TY	Type	Non-repeatable	Required
----	------	----------------	----------

Enter the appropriate code for the type of material being catalogued for the database. The following codes have been designated for the various types of materials in the database.

a	analytic in a collected work or proceedings
j	journal article
m	monograph
s	serial or journal title
t	textbook
th	thesis
mr	master's report

Additional codes will be assigned if the need arises.

TY	m
TY	a

LO	Location	Repeatable	Required
----	----------	------------	----------

Enter the code for the library in which the monograph is shelved. The following codes have been established for contributors to the database.

au	NWFP Agricultural University Library
id	Institute for Development Studies

Additional codes will be assigned as other libraries join the information system.

<u>Code</u>	<u>Location</u>
au	Agricultural University
ad	Abbotabad Potato Research Station
dn	D. I. Khan Agricultural Research Station
id	Institute of Development Studies
ma	Mansehra Agricultural Research Station
mn	Mardan Sugar Crop Research Institute
mr	Mingora Agricultural Research Station
pk	Pirsabak Cereals Reserach Institute
tr	Tarnab Agricultural Research Institute

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CN	Call Number	Non-repeatable	Required
-----------	--------------------	-----------------------	-----------------

Enter the call number for the monograph. The call number consists of two parts: (1) Dewey Decimal Classification (DDC) number and (2) first three letters of the author's surname. Type the DDC number, one space, then the author letters.

CN	633.18 BEN
CN	338.109549 KHA

For analytic entries, enter the call number of the volume in which the analytic is physically located.

CN	631.7 NOB
----	-----------

For serials entries, enter the subject name of the section in which the journal is shelved. Codes for the various departments are listed in Appendix 1.

CN	AGRECON
----	---------

CA	Category No.	Non-repeatable	Required
-----------	---------------------	-----------------------	-----------------

Enter the Dewey Decimal Classification (DDC) number under which the item should be classified in the book catalogue. For monographs this will normally be the same as the DDC number in the call number (CN) field. For analytic entries, this will often be a different DDC number than the DDC number in the call number of the book in which it is collected. Serial records should be assigned the appropriate DDC number for the subject of the journal. Journal article records will be assigned a DDC number for the category, but will not have anything in the Call no. field.

CN	633.18 BEN	Monograph
CA	633.18	
CN	630 JOH	Analytic
CA	338.1	
CN	AGRECON	Serial
CA	338.1	
CN		Journal article
CA	636	

LA	Language	Repeatable	Required
----	----------	------------	----------

Enter the code for the language of the text. The following codes have been designated for the various languages in the collection. Additional codes for other languages may be found in AACR II.

Eng English
 Urd Urdu

LA Eng
 LA Urd

AU	Author	Repeatable	Required
----	--------	------------	----------

Enter the author, editor, or corporate author in this field. Each author should be entered as a repeating field. Individual authors are to be typed with surname, a comma and space, followed by the given names or initials.

Corporate names should be spelled out in full. The purpose for this is to make entries clear to patrons. Articles *a*, *an*, or *the* are to be dropped at the beginning of a corporate name.

Food and Agriculture Organization, United Nations, *not* FAO
 State Bank of Pakistan, *not* The State Bank of Pakistan

For editors and compilers, the individual's name(s) are entered in the author (AU) field with the editor designation entered in the Ed. Comp. (EC) field.

AU	Cabally, E. I. ; French, John R. ; Jones, Peter A.	Individual authors
AU	World Bank ; Food and Agriculture Organization, United Nations	Corporate authors
AU	Johnstone, B. I. ; Freeman, David L.	Editors
EC	Eds.	

EC	Editor/Compiler	Non-repeatable	Optional
-----------	------------------------	-----------------------	-----------------

If the individual entered in the author field (AU) is an editor or compiler, enter the correct designation in this field. The reason a separate field was added for this designation was to keep the indexes created from the author field as clean and consistent as possible. Enter the appropriate abbreviation from the list below. Additional abbreviations will be assigned if the need arises.

Ed.	single editor
Eds.	more than one editor
Comp.	compiler
Comps.	more than one compiler

AU	Johnstone, B. I. ; Freeman, David L.
EC	Eds.

AU	Hamilton, Lawrence S.
EC	Ed.

AU	Tidbury, G. F.
EC	Comp.

TI	Title	Non-repeatable	Required
-----------	--------------	-----------------------	-----------------

Enter the title of the piece including the sub-title. The title should always be separated from the sub-title with a colon and a single space. Only the first word and any proper nouns in the title should be capitalized. All other words in the title should begin with small letters. Do not add any end punctuation unless there is a question mark or exclamation mark at the end of the title on the title page. Do not abbreviate any words in the title which are not abbreviated on the title page. Use this field for titles of analytical entries and journal articles.

TI	Our soils and their management: increasing production through environmental soil and water conservation
----	--

TI	Modernization of Muslim education in Egypt, Pakistan, and Turkey: a comparative study
----	--

TI	Modern potato and vegetable storages <i>not</i> Modern potato & vegetable storages
----	--

AAU	Added Author	Repeatable	Optional
------------	---------------------	-------------------	-----------------

Enter names of additional authors or organizations which may not be entered in the author (AU) field, but would enhance retrieval capabilities. This field is often used for names of editors for a serial, individual authors in a collected work if analytic records are not prepared for each individual paper, or for names of organizations. Enter names using the same rules as those for the author field. When searching, use the search string * get au/aau st [name] or * get au/aau cw [name] to maximize retrieval.

AU	Rickards, Teresa
TI	Cambridge illustrated thesaurus of physics
NOTE	Edited by R. C. Denney and Stephen Foster.
AAU	Denney, R. C. ; Foster, Stephen

ATI	Added Title	Repeatable	Optional
------------	--------------------	-------------------	-----------------

Enter additional or variant titles for the document which will enhance retrieval. This may include a significant sub-title, titles of individual volumes in a set, or titles of individual chapters in a collected work or proceedings if analytical entries have not been made for those documentary units. Follow the rules for entry and capitalization as outlined under the title (TI) field. When searching, use the search string * get ti/ati st [name] or * get ti/ati cw [name] to maximize retrieval.

TI	Report of the FAO global survey of pesticide susceptibility of stored grain pests
ATI	Global survey of pesticide susceptibility of stored grain pests
TI	Classification of flowering plants
AB	Contents: v. 1. Gymnosperms and monocotyledons -- v. 2. Dicotyledons
ATI	Gymnosperms and monocotyledons ; Dicotyledons

ED	Edition	Non-Repeatable	Optional
----	---------	----------------	----------

This field is used only for monographs. Enter the edition statement according to AACR II cataloguing rules. Some of the more common forms to follow are listed below in the examples.

- ED 2nd ed.
- ED Rev. ed.
- ED 5th rev. ed.

PL	Place	Non-repeatable	Required
----	-------	----------------	----------

This field is used to enter the place of publication only for monographs, serials, and analytics. Enter the name of the city, the state (if given), and the country if not a commonly known city. Commas should separate city, state, and country. Only the first place listed on the title page should be entered. State names may be abbreviated as they are on the title page. If there is any uncertainty in deciding the name of the city, consult with the head librarian. If no place of publication is given, the abbreviation *n.p.* may be used.

- PL Englewood Cliffs, New Jersey
- PL Lahore
- PL Cambridge, Massachusetts
- PL Danville, Illinois
- PL Hyderabad, India
- PL Hyderabad, Pakistan

PUB	Publisher	Non-repeatable	Required
------------	------------------	-----------------------	-----------------

This field is used to enter the publisher statement only for monographs, serials, and analytics. Enter the publisher statement according to AACR II cataloguing rules. Enter the main name of the publisher, but omit the terms Co., Ltd., etc.

PL	Lahore		
PUB	Publishers United		
PL	London		
PUB	Published for the Systematics Association by Academic Press		
PL	Englewood Cliffs, New Jersey		
PUB	Prentice-Hall		
PL	London		
PUB	Heinemann		

DT	Date of Publication	Non-repeatable	Required
-----------	----------------------------	-----------------------	-----------------

This field is used to enter the date of publication for monographs, serials, and analytics. Use the journal date (JD) field for the publication date for journal articles. Enter the four digit year for the date of publication. Enter a beginning and ending year for multi-volume sets only. For monographs, a copyright date may be entered with a preceding c. If no date is given on the title page, enter the abbreviation n.d. in the field. At times, one may be able to make a fairly accurate guess as to the date and it may be entered followed by a question mark (?).

DT	1976	simple date of publication	
DT	1981-1983	inclusive dates for multi-volume set	
DT	[n.d.]	no date given	
DT	[1983?]	fairly accurate guess	
DT	[198-]	decade certain	
DT	[198-?]	probable decade	
DT	Vol 1- 1968-	date for serials, currently publishing	
DT	Vol 1-8 1971-1979	date for serials, no longer publishing	

SR	Series	Repeatable	Optional
----	--------	------------	----------

Enter the series title and number following AACR II cataloguing standards. If there is more than one series, enter each as a repeating field. Capitalization of series titles is the same as that for the title (TI) field. Capitalize only the first word and any proper noun in the series title.

- SR Studies in agricultural and food sciences
- SR World animal science. C, Production-system approach; 1
- SR Botanical monographs; vol. 19
- SR Systematics Association special volume; no. 20
- SR Physiological series in environmental health

COL	Collation	Non-repeatable	Required
-----	-----------	----------------	----------

This field is used only for monographs, not analytics, serials or journal articles or serials. Enter the pagination and illustration information following AACR II cataloguing standards. Use abbreviations as listed in AACR II. Separate number of pages information from illustrations information with a space, colon, space sequence (:).

- COL xv, 472 p. : ill.
- COL 1 vol. in 4 parts (673 p.)
- COL xv, 790 p., [32] p. of plates : ill.

BN	ISBN	Repeatable	Optional
----	------	------------	----------

This field is used to enter the International Standard Book Number (ISBN) for monograph records only. Enter the 10-digit number without any dashes or spaces within the number. The field is repeatable as there may be different numbers for hard bound and soft bound versions of titles.

ISBN 0444423206
 ISBN 085236119X
 ISBN 0412242303
 ; 0412242300 (pbk.)

SUB	Subject	Repeatable	Required
-----	---------	------------	----------

Enter the subject terms which best describe the contents of the work. Select terms from the *CAB Thesaurus* as the primary source of terms and, secondarily, from the *Library of Congress Subject Headings* when appropriate terms are not found in the *CAB Thesaurus*. Use only main headings, not sub-divisions, when using Library of Congress headings. Enter as repeating fields as many terms as are needed to describe the work. Enter geographical headings in the geographical code (GE) field. Only the first word and proper nouns in a subject term should be capitalized.

SUB Pesticides
 ; Environmental aspects

SUB Rural development
 ; Management

GE India

SUB Islam
 ; Education

GE Middle East
 ; Egypt
 ; Pakistan
 ; Turkey

SUB Land use
 ; Economic aspects
 not

SUB Land use - Economic aspects

SUB Agricultural engineering
 not

SUB Agricultural engg.

GE	Geographical Subject	Repeatable	Optional
-----------	-----------------------------	-------------------	-----------------

This field is used to enter geographical subjects including country names, regional and place names particularly within Pakistan, and terms used for groups of countries. Only the first word and proper nouns in the geographical term should be capitalized. Use the *CAB Thesaurus* for proper form for country names and names of regions throughout the world. An authority list for names within Pakistan will need to be maintained for all to use if one does not presently exist.

- GE South Asia
; South East Asia
- GE Sind
; Punjab
- GE Africa south of Sahara

NOTE	Notes	Repeatable	Optional
-------------	--------------	-------------------	-----------------

This field is used to enter notes which will be printed in the book catalogue such as information on bibliographies, indexes, etc. Include information on the name, place, and date of a conference in this field. Follow AACR II cataloguing standards for notes. Each note should be entered as a repeating field and end punctuation should be included where required.

- NOTE Glossary: p. 297-301.
; Includes tables.
; First published on the occasion of the First World
Conference on Muslim Education, Makkah, March, 1977.
; Proceedings of a seminar Research on the Improvement of the Production
of Plant Proteins, held at Cambridge, England, June 27-29, 1979.

Notes for serial publications also include information on indexing.

- NOTE Intended as a successor to the International Seed
Testing Association Seed Bibliography.
; Edited for the International Seed Testing Association, <1984->
; Indexed selectively by: Chemical abstracts 0009-2258

PR	Price	Non-repeatable	Optional
----	-------	----------------	----------

This field is used for monographs only. Enter the price of the book including the appropriate currency sign. Those signs which have already been defined are listed below. *Conversion to rupees from foreign currencies should be made at the time of purchase or follow the adopted policy of your library.*

Rs Rupees
 \$ U.S. dollars
 £ Pounds sterling [Alt 156]

Additional currency codes will be added as the need arises.

PR \$39.95
 PR Rs.325.00
 PR £8.95

COP	Copies	Non-repeatable	Optional
-----	--------	----------------	----------

This field is used for monograph records only. Only if there is more than one copy, enter the number of copies in Arabic numerals. Then enter accession numbers for all copies in parentheses.

NO 8281
 COP 8281-8282, c.1-2

NO 23510
 COP 23510-23549, c.1-30

NO 28609
 COP 28609, c.1
 28662, c.2

NO tp 4132
 COP tp 4132-tp 4134, v.1-3 c.1
 48734-48736, v.1-3 c.2

SO	Source	Non-repeatable	Optional
-----------	---------------	-----------------------	-----------------

This field is used only for analytical entries. Enter the title and name(s) of the editors of the parent document. Follow the editors with a comma (,) and then the pages of the chapter or paper within the edited work. Enter the place of publication, publisher, and date of publication in the PL, PUB, and DT fields respectively. The word *In* will be added at the beginning of this field by the output format.

- SO Applied irrigation water management: studies from South and Southeast Asia, edited by Kenneth C. Nobe, p. 56-81
- SO Rural development in Bangladesh and Pakistan, ed. by Robert D. Stevens, Hamza Alavi, and Peter J. Bertocci, p. 290-316

JT	Journal Title	Non-repeatable	Required
-----------	----------------------	-----------------------	-----------------

This field is used only for journal articles. Enter the title of the journal in which the article is published. Capitalize the title of the journal following the same rules for capitalization as the title (TI) field.

- JT Sarhad journal of agriculture
- JT Pakistan journal of agriculture
- JT Journal of the American Association of Agricultural Economics
- JT Proceedings of the Pakistan Academy of Sciences

JD	Journal Date	Non-repeatable	Required
-----------	---------------------	-----------------------	-----------------

This field is used only for journal articles. Enter the year of the journal issue in which the article is published. This field is separated from the DT field so that it may be printed differently in report formats.

JD 1987
 JD 1988
 JD 1985

JC	Journal Collation	Non-repeatable	Required
-----------	--------------------------	-----------------------	-----------------

This field is used only for journal articles. Enter the volume, issue and pagination of the article in the journal.

JC 8(2):38-47
 JC No. 5:108-132

SN	ISSN	Non-repeatable	Optional
-----------	-------------	-----------------------	-----------------

This field is used to enter the International Standard Serial Number (ISSN) of the journal in the case of a serial or the parent journal in the case of a journal article. Enter the eight-digit number with the two groups of four numbers separated with a dash (-).

SN 0003-5638
 SN 3021-6903

FRQ	Frequency	Non-repeatable	Optional
-----	-----------	----------------	----------

This field is use for serials entries only. Enter the frequency of publication of the journal. Use the standard abbreviations used in *AACR II* as much as possible.

- FRQ M (monthly)
- FRQ A (annually)
- FRQ Bi-a (biannually or biennially)
- FRQ Bi-mo (bi-monthly)
- FRQ Q (quarterly)
- FRQ Semi-a (semi-annually)
- FRQ Semi-mo (semi-monthly)
- FRQ Irreg (irregularly)
- FRQ W (weekly)

PT	Previous title	Repeatable	Optional
----	----------------	------------	----------

This field is used for serials only. Enter the name and ISSN number (if known) of the previous title of the serial. Follow *AACR II* standards for entry.

- PT Advances in enzymology and related subjects 0196-7398
- PT Applied biology 0197-1352

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ST	Superseded title	Repeatable	Optional
----	------------------	------------	----------

This field is used for serials only. Enter the name and ISSN number (if known) of the superseded title of the serial. Follow *AACR II* standards for entry.

- ST Advances in enzymology and related areas of molecular biology 0065-258X
- ST Reviews of environmental contamination and toxicology 0179-5953

HOL	Holdings	Repeatable	Optional
-----	----------	------------	----------

This field is used for serials only. Enter the holdings of the serial title in the following format: location abbreviation, colon (:), volume and year information.

- HOL AU: v. 14 (1962), v. 29-33 (1977-1980), v. 37 (1984)
- HOL AU: v. 8-9 (1971-1972), v. 15 (1980)
- HOL AU: v. 1 (1961)- [missing: v. 6:2-3 (1966), v. 12:4,6 (1972), v. 18:1, 3-5 (1978)]

Sample Records

Monographs

Fields Allowed

Example

NO	NO 40368
DA	DA Feb. 1989
PE	TY m
TY	; t
LO	LO au
CN	CN 631.3 PAG
CA	CA 631.3
LA	LA Eng
AU	AU Klute, Arnold
EC*	; Page, Albert Lee
TI	EC Eds.
AAU*	TI Methods of soil analysis
ATI*	PL Madison, Wisconsin
ED*	PUB American Society of Agronomy and Soil Science Society of America
PL	
PUB	DT 1982
DT	SR Agronomy; no. 9
SR*	COL 2 Vols.
COL	BN 0891180729 (Pt. 2)
BN*	SUB Soil analysis
SUB	AB Contents: Pt. 1. Physical and mineralogical methods / Arnold Klute, editor -- P. 2. Chemical and microbiological properties / A. L. Page, editor.
GE*	
AB*	
PR*	PR Rs.7614.00 (one set)
NOTE*	AAU American Society of Agronomy
COP	; Soil Science Society of America ; Klute, Arnold ; Page, A. L. COP 40368-40369, v.1 c.1-2 ; 40370-40371, v.2 c.1-2 ; 46321-46322, v.1-2 c.3 ATI Physical and mineralogical methods ; Chemical and microbiological properties \$

* Optional field

Sample Records

Theses

Fields Allowed

Example

NO	NO th 341
DA	DA Aug. 1989
PE	PE ms
TY	TY th
LO	LO au
CN	CN AGRON
CA	CA 633.18
LA	LA eng
AU	AU Izhar Ahmad
TI	TI The effect of five fungicides (seed dressing) and their rates on the emergence and yield of wheat variety Khyber-79
PUB	PL Peshawar
DT	PUB NWFP Agricultural University, Department of Agronomy
COL	DT 1982
SUB	COL 94 p.
GE*	SUB Fungicides
AB*	; Seed dressing
NOTE	; Wheat
COP	; Varieties
	GE Pakistan
	AB The effect of five fungicides as seed dressers at the rate of 0, 1 and 3 grams per kg of seed was investigated on wheat cultivar Khyber 79, at two locations during 1981-82 growing season. All fungicides had beneficial effect on grain yield and other plant characteristics. Dithan M 45 had the least minimum effect among the fungicides studied. The effect was more pronounced on grain yield than vegetative growth or stalk production. Application of any fungicide at the rate of 2 grams per kg of seed was found to be the optimum dose for seed dressing.
	NOTE Includes graphs, bibliography and tables.
	; Thesis [M.Sc. Hons]
	COP th 341, c.1
	\$

* Optional field

Sample Records

Serials

Fields Allowed

Example

NO	NO s 1
DA	DA 1-June-1988
PE	PE ak
TY	TY s
LO	LO au
CN	CN AGRECON
CA	CA 338.1
LA	LA eng
AU	TI American journal of agricultural economics
EC*	PL St. Paul, Minnesota
TI	PUB American Agricultural Economics Association
PT*	DT Vol. 50- Feb. 1968-
ST*	SN 0002-9092
AAU*	SUB Agricultural economics
ATI*	; Agriculture
PL	; Periodicals
PUB	NOTE Vols. for <1982- > include the proceedings of the annual
DT	meeting of the American Agricultural Economics Association.
SR*	; Vols. for 1984- have special biennial issue called: Directory of the
COL	American Agricultural Economics Association.
SN*	PR \$69.00
FRQ	FRQ 5 no. a year
SUB	PT Journal of farm economics
GE*	ATI Directory of the American Agricultural Economics Association
PR*	HOL AU: v. 50 (1968)- [missing: v. 54:1,4 (1972), v. 60:8-10
NOTE	(1978), v. 70:3 (1988)]
HOL	\$
COP*	

* Optional field

Sample Records

Journal Articles

Fields Allowed

Example

NO	NO j 185
DA	DA Feb. 1990
PE	PE rd
TY	TY a
LO	LO au
CA	; id
LA	CA 631.8
AU	LA eng
EC*	AU Muhammad Iqbal Chaudhry
TI	TI The study of fertilizer use in Pakistan
JT	JT The journal of development studies
JD	JD 1979
JC	JC 2:95-106
SN*	SUB Fertilizers
SUB	GE Pakistan
GE*	AB Presents the findings of the study in which the null hypothesis that access to irrigation, distance to the fertilizer source, education of the farmer, farm size and quality of road linking the farm to the fertilizer source are not correlated with adoption (use versus non-use) of fertilizer are rejected. As measured by their relative significance, use of irrigation is by far the most important explanatory variable, followed by distance to the fertilizer source, farmer's education, farm size and quality of the road linking the farm to the fertilizer source. The hypothesis that the farmer's age and tenurial status have no effect on adoption of fertilizer cannot be rejected.
AB*	
NOTE*	\$

* Optional field

Sample Records

Analaytics

Fields Allowed

Example

NO	NO 40382-1
DA	DA Feb. 1990
PE	PE ak
TY	TY a
LO	LO au
CN	CN 307.725491 STE
CA	CA 338.195491
LA	LA eng
AU	AU Burki, Shahid Javed
TI	TI The development of Pakistan's agriculture: an interdisciplinary explanation
SO	SO Rural development in Bangladesh and Pakistan, ed. by Robert D. Stevens, Hamza Alavi, Peter J. Bertocci, p. 290-316
PL	PL Honolulu, Hawaii
PUB	PUB University Press of Hawaii
DT	DT 1976
SR*	SR Agricultural development
COL	COL Pakistan
SUB	SUB This paper reaches beyond neoclassical economics into other disciplines to provide an explanation for the behaviour of West Pakistan's agricultural sector.
GE*	
AB*	
NOTE*	

* Optional field

Appendix 1

Location Codes for Serials

AGRCHEM	Agricultural Chemistry and Human Nutrition
AGRECON	Agricultural Economics, Rural Sociology and Extension Education
AGRMECH	Agricultural Mechanization and Water Management
AGRON	Agronomy
ANIMSCI	Animal Science
ENTOMOL	Entomology
FOODTECH	Food Science and Technology
GENAGR	General Agriculture
GENSCI	General Sciences
HORT	Horticulture
ISLAM	Islamic and Pakistan Studies
MATHSTAT	Mathematics, Statistics and Computer Science
MISC	Miscellaneous
PBG	Plant Breeding and Genetics
PLANTPATH	Plant Pathology
PLANTPROT	Plant Protection
SOILSCI	Soil Science

Appendix 2

Data Structure for AULIB Database

Label	Name	Index	Sort	Explanation
NO	ACCNO	T	7	Accession number (used for quick retrieval of record in maintenance operations).
DA	DATINPUT	T	4	Date input (use form required by INMAGIC for date sorts, i.e. Apr. 1988).
PE	PERSON	N		Initials of person cataloguing record.
TY	TYPE	T	2	Type of record (i.e., m-monograph; s-serial; j-journal article; or a-analytic).
LO	LOCAT	T	2	Location of item (i.e., au-main library; id-Institute of Development Studies library, etc.). Repeatable field.
CN	CALLNO	N		Call number (i.e., 633.18 BEN).
CA	CATEG	T	2	Category for classified book catalog (use simplified Dewey numbers). Limit one.
LA	LANG	N		Language of text (i.e., eng-English; fre-French; urd-Urdu; etc.). Repeatable field.
EN	ENTNO	T	2	Entry number for printed outputs (added by main library after sorting records for output).
AU	AUTHOR	Y	7	Author(s) and/or corporate author. Enter each author as a repeating field (i.e., AU Cabally, E. I. ; French, John R.
EC	EDCOMP	N		Editor or compiler code (i.e., Ed., Eds., Comp., etc.).
TI	TITLE	Y	5	Title of piece including subtitle.
PT	*	Y	5	Previous title (for serials only).
ST	*	Y	5	Succeeding title (for serials only).
ED	EDITION	N		Edition statement (for monographs only).
SO	SOURCE	N		Source of an analytical entry for a chapter in a book or a paper in a published proceedings including pagination (i.e., Advances in agronomy, edited by N. C. Brady, p. 146-172).
PL	PLACE	N		Place of publication (for monographs, serials, and analytics).
PUB	PUBLISH	N		Publisher (for monographs, serials, and analytics).
DT	DATE	T	4	Date of publication. Do not use for journal articles; use JD field instead. For serials enter beginning volume number and date, i.e., Vol. 1- 1956-.
SR	SERIES	Y	5	Series title and number (i.e., Water resources series; no. 37). Repeatable field.
JT	JOURTTT	Y	5	Journal title (for journal articles only).
JD	JOURDATE	T	4	Date of publication for journal article.
JC	JOURCOL	N		Collation for journal articles (i.e., 6(5):256-279).
COL	COLLAT	N		Collation (use for monographs only, not serials, journal articles or analytics).

Label	Name	Index	Sort	Explanation
FRQ	*	N		Frequency (use for serials only).
HOL	*	N		Holdings (use for serials only).
BN	ISBN	N		International standard book number (for monographs only). Repeatable field.
SN	ISSN	N		International standard serial number (for serials and journal articles only).
SUB	SUBJECT	Y	5	Subject terms. Select from the <i>CAB Thesaurus</i> as primary source and secondarily from <i>Library of Congress Subject Headings</i> when required. Repeatable field.
GE	GEOG	Y	5	Geographical subject(s) including country names, regional and place names particularly within Pakistan, and terms used for groups of countries (i.e., South East Asia). Repeatable field.
AB	ABSTR	N		Abstract, annotation, or contents. Repeatable field.
NOTE	*	N		Notes to be printed in the book catalogue (i.e., Bibliography: pp. 285-302). Repeatable field.
PR	PRICE	N		Price of book including currency sign.
AAU	ADDAU	Y	7	Added author. Use for organization names for which you would like an added entry as well as individual names for which access is desirable.
ATI	ADDTI	Y	5	Added title. Use for variant titles, cover titles, etc. mentioned in notes and for which access is desirable.
COM	COMMENT	N		Comments for internal use; will not be printed in book catalogue. Repeatable field.
COP	COPIES	T	2	Copy numbers accompanied by accession numbers (i.e., 828-829, c.1-2; 1350, c.3; etc.).

Data Entry for AULIB Database

Start-Up

1. Turn on the computer. When you have the menu on the screen, put the WordPerfect data entry diskette in Drive A if a high density diskette or Drive B if a 3-1/2" diskette.
2. Press the appropriate letter to enter WordPerfect 5.0 with either Drive A or Drive B as the default drive.

Data Entry

3. With the screen blank except for the status line at the lower right hand corner of the screen, retrieve the appropriate form for input by pressing:

[Alt] m for monographs, or

[Alt] s for serials, or

[Alt] a for analytics, or

[Alt] j for journal articles

Each form has been developed to include only those field labels relevant to the data required for the different types of materials in the collection.

If this is the first time during the month that the form has been used, it may be necessary to modify the DA field for the current month. At the beginning of each month, make the necessary correction, then save the file while still blank by pressing [F10]. The prompt in the lower left corner of the screen should read

Document to be Saved: A:\MONO.FRM

Press [Enter] to save the revised form under the same name. It should be necessary to modify the MONO.FRM file only once each month. Be certain to save only the blank form. After saving, move the cursor to the top of the form [Home][Home][Up] and to the end of the line by pressing the [End] key. You are now ready for data entry.

4. The labels for the various fields will appear. Type in the data next to the appropriate label (i.e., NO, AU, TI, DT, PL, PUB, etc.). Move down to the next field by using the cursor keys. If there is no data for a field, press [Alt] d to delete the field label and move to the next field.

To copy the Dewey number from the call number field (CN) to the category field (CA), press [Alt]c when the cursor is at the end of the CN field.

Saving the File

5. After you have finished the first record, go to the bottom of the file by pressing [Home][Home][Down] and save the file by pressing [F10]. The first time you save the file after entering data, you will see the statement:

Document to be saved: A:\MONO.FRM

You do *not* want to save the file under the name **mono.frm**. If you do save it under that name, there will no longer be a blank form to retrieve. Instead, you want to give it a name such as **aulib#.add** where the **#** is replaced with the appropriate number (i.e., **aulib1.add**, **aulib8.add**, **aulib10.add**, etc.). Type in **aulib#.add** [Enter]. From now on when you save your file, your new file name will appear in the "Document to be Saved" statement and you may simply update that file. The *.add files should ideally contain information for about 30 to 50 records. It is a good habit to resave the file after completing each record.

Entering Additional Records

6. After saving the file, go to the bottom of the file [Home][Home][Down] if the cursor is not already there. Retrieve the blank form for the next record to be input by pressing [Alt] m. Again the blank form will be on the screen ready for data entry. Enter data as stated in step 4. above. Update the file on the disk after completing each record by pressing [F10], use the same name by pressing [Enter], then type Y to replace and update the file on the disk.

Checking the Spelling

7. After entering all the records for the day, check the spelling via the computer. Go to the top of the document. Press [Ctrl] [F2] to begin the spelling check. Choose 3 document to check the spelling in the entire document. Make the necessary corrections to your document. If the word is spelled correctly but not in the dictionary, press 2 to skip it for the remainder of the document. If the word is one you want to add to the dictionary like the name of a geographical region that is often used, then press 3 to add it to the supplementary dictionary.

Format of Records Required by INMAGIC

8. The data must be entered in the format acceptable to the INMAGIC database management system. The following criteria must be followed in the data entry process. (See Example on next page.)
 - a. All fields must begin with the label for that field.
 - b. Lines longer than 80 characters (width of the screen) may be continued on additional lines. (The lines may be much shorter than 80 characters, but they may not exceed 80 characters.) However, each line must end with a carriage return (HRt in WordPerfect) and each continuation line must begin with a space. Alternatively the tabs may be set at 1" and 1.1" and each field label preceded with [Indent] [Margin Rel]. This allows one to use word wrap and have continuation lines begin with a space.

- c. Repeating fields must begin with a semicolon and space (;).
- d. Each record must be terminated by a dollar sign (\$).

Example

	NO tp 787
	DA Sep. 1989
	PE ak
	LO au
Field labels	TY m
	CN 636.086 BON
	CA 636.086
	LA eng
	AU Bond, D. A.
	EC Ed.
	TI Vicia faba: feeding value, processing, and viruses
	PL Boston
	PUB M. Nijhoff for the Commission of the European Communities
	DT 1980
	SR World crops: production, utilization, and description; v. 3
	COL x, 422 p. : ill.
	BN 9024723620
	SUB Plant breeding
Repeating fields	; Faba bean
	; Plant viruses
	; Pests
Continuation lines	NOTE Proceedings of a seminar in the EEC Programme of Coordination of Research on the Improvement of the Production of Plant Proteins, held at Cambridge, England, June 27-29, 1979 / sponsored by the Commission of the European Communities, Directorate-General for Agriculture, Coordination of Agricultural Research.
	; Held as the annual meeting of the EEC Seed Legume Group.
	; Includes bibliographies.
	PR \$44.00
End of record delimiter	COP tp 787-tp 788, c.1-2 \$

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Transferring Files from WordPerfect to INMAGIC

The transfer of files from WordPerfect to INMAGIC requires that files be sent in a standard format called DOS text files or ASCII files. These instructions delineate the steps to follow in entering data into the AULIB database established for the Northwest Frontier Province Agricultural University Library using INMAGIC database management software.

Saving WordPerfect Files as DOS Text Files

1. While in WordPerfect with the file you wish to transfer on the screen, press [Ctrl] [F5]. You will see the following menu on the screen:

1 DOS Text; 2 Password; 3 Save Generic; 4 Save WP 4.2; 5 Comment; 0

Select 1 - DOS Text by pressing 1 or T. You will then see the prompt

1 Save; 2 Retrieve (CR/LF to [HrT]); 3 Retrieve (CR/LF to [SRt] in HZone); 0

Select 1 Save by pressing 1 or S. You will then see the following prompt

Document to be saved (Dos Text): filename

Press [Enter] as you wish to save the current document as a DOS text file. This procedure takes all the special codes out of the document that are put into it by the WordPerfect and saves it in the standard format that may be read by most software programs.

2. After saving the file as a DOS text file you will return to the text on the screen. At this time you want to exit out of WordPerfect by pressing [F7]. You do *not* want to save the file. If you save the file again, all the WordPerfect codes would be put back into the file. When prompted **Save Document? (Y/N) Yes**, type N. Then when asked **Exit WP? (Y/N) No**, type Y. You will then return to the main menu.

Backup Current Copy of Database

1. Before continuing the process to add new records to the database, make certain you have a backup of the current database. If anything should happen to the power during the batch add process, then you will be able to restore the database from the backup copy and attempt to add the new records again.

Adding Data to the INMAGIC Database

1. Enter the INMAGIC database management software system.
2. When the INMAGIC menu appears and you are asked to **Enter choice:**, type **m** [Enter] for the MAINTAIN menu. You will then be prompted to **Enter name of database file (up to 8 characters)**. Type **aulib** [Enter]. You will then be asked to **Enter Work File ID code**. Type the first initial of your name and [Enter].
3. The INMAGIC - MAINTAIN Menu will appear on your screen.

AULIB

----- INMAGIC - MAINTAIN Menu -----

COMPOSE	LOG
ADD	TEACH
REMOVE	EXIT
BUILD	

Transaction log to screen. Enter L to change.

Enter choice (? for help): _

At the prompt **Enter choice (? for help):**, type **L** [Enter] to change the transaction log to write to disk. You will see the following prompt:

Enter transaction log file name or P for printer:

Type **a:log.txt** to send the transaction log to the disk in drive A. You will then see the menu followed by the message:

Transaction log to: A:LOG.TXT

Enter choice (? for help):

This time type **A** [Enter] to add records in batch mode. You will then be prompted: **Name of incoming file**. Type **a:mono#.txt** with the **#** replaced by the number of the mono.txt file you are adding, e.g., **mono3.txt**. When asked **Replace existing records if found (Y/N)?**, type **N** [Enter]. Since you are adding new records to the database, there should not be anything to replace.

If you get the message

Cannot open file. Check file name for accuracy and reenter:

you have probably mistyped the filename or forgotten the disk drive letter. Retype the filename correctly. As the records are added, you will see a message on the screen showing which record number was added. These same messages are being written to your transaction

log file on the disk in drive A. You may leave the machine at this time and return when the entire file has been added.

4. When all records have been added you will hear a series of beeps from the computer. The status line will indicate how many records were added, how many were rejected, and how many were replaced. Then you are requested to press RETURN to continue. Press [Enter] to return to the INMAGIC - MAINTAIN Menu. Type e [Enter] two times to exit completely out of INMAGIC.

Making Corrections in the Data File

1. If all the records were successfully added, then there is no need to look at the transaction file. You may simply delete the file **log.txt** from the disk in drive A. However, if the status line in INMAGIC indicated that some records were rejected, then you must look at the transaction log to see which records were rejected. Enter WordPerfect. Press [F5] [Enter] to list the files on your data disk in drive A. Move the cursor to **LOG.TXT** and press 5 to retrieve the file as a DOS text file. Look at the log one screen at a time (use the plus and minus keys on the number pad) to locate any error messages such as the following:

Line does not begin with acceptable character or field name:

xxxx¹

Field label or name occurs more than once:

xxxx¹

No retrieval key field:

xxxx¹

Retrieval key already exists:

xxxx¹

Make notes of which records contain errors.

2. Clear the screen (or change to document 2 [Shift][F3]) and retrieve as a DOS text file the **mono#.txt** file in which all the records did not successfully transfer to INMAGIC. Locate specific records by using the **Search** function [F2].
3. Make corrections. Then resave the file as a DOS text file as in the section above **Saving WordPerfect Files as DOS Text Files**.
4. Alternatively, if there are only a few records which need to be corrected, these may be copied into a temporary file such as **cor.txt**. This temporary file must be saved as a DOS text file and may then be added to the database. After the records have been successfully added, remove the temporary file from the disk.

¹ The xxxx stands for the first line of the record.

Reentering Data into the INMAGIC Database

1. Repeat the steps in the section **Adding Data to the INMAGIC Database**. The transaction file A:\LOG.TXT must be deleted if you wish to use that name again. If the file is still on the disk in Drive A, then give the new transaction log file a different name like A:\LOG1.TXT. Again you must choose not to replace existing records by typing N.
2. As each record is manipulated, you will see the message **Record already exists, Record added,** or an error message to let you know what happened to the record.
3. When the batch process is completed, press [Enter], and then type e [Enter] two times to exit out of M and return to the DOS operating system.

Appendix 5

Output Formats for AULIB Database with Samples

LISTNDX Display selected fields on the screen with accession number (NO)

Name of format: LISTNDX

Name of data structure: AULIB

Date created: 05/31/88

Date last modified: 02/21/90

A. PAGE DEFINITION

Enter physical page length (number of lines): 23

Enter top margin (number of lines): 0

Enter bottom margin (number of lines): 0

Enter maximum page width (number of characters): 79

Enter number of blank lines between records: 0

Enter whether record may be broken across pages (Y/N): N

Enter whether underline characters should print as spaces (Y/N): N

Enter whether to pause between pages (Y/N): Y

B. USER QUESTION DEFINITIONS

C. CALCULATION DEFINITIONS

D. PAGE LAYOUT

E. RECORD LAYOUT

1. accno, column 1 - 8, line 1

2. @INDEX, column 13 - 79, line 1, indent -3

Sample Output

```
D 2387  Design and evaluation of terrestrial model ecosystem for evaluation
        substitute pesticide chemicals
31206  Livestock: judging, selection and evaluation.
21768  The mutagenicity of pesticides: concepts and evaluation
3156   Nutritional evaluation of food processing
37088  Progress in land evaluation
30175  Project evaluation criteria and cost benefit analysis
tp 4523 Protein-energy requirements of developing countries: evaluation of
        new data
30173  Studies in evaluation
```

Continue? (Y/N) _

SRCHLIST Formats results of searches for displaying on the screen

Name of format: SRCHLIST
Name of data structure: AULIB
Date created: 06/03/88
Date last modified: 02/21/90

A. PAGE DEFINITION

Enter physical page length (number of lines): 23
Enter top margin (number of lines): 0
Enter bottom margin (number of lines): 0
Enter maximum page width (number of characters): 80
Enter number of blank lines between records: 1
Enter whether record may be broken across pages (Y/N): N
Enter whether underline characters should print as spaces (Y/N): N
Enter whether to pause between pages (Y/N): Y
.....

E. RECORD LAYOUT

- | | |
|---|---|
| 1. callno, column 1 - 9, line 1, wordlist | 13. jourtit, begin ' ' |
| 2. @paragraph, column 11 - 78, line 1 | 14. jourcol |
| 3. author, separate '; ', end punct '' | 15. jourdate, begin '(', end ')' |
| 4. edcomp, begin '(', end ')' | 16. series, begin '(', end ')' |
| 5. @paragraph, column 11 - 78, indent 3, line + 1 | 17. hol, line bottom, indent 0 |
| 6. title, end punct '' | 18. pt, line bottom, begin 'PT: ' |
| 7. frq, begin '(', end ')' | 19. st, line bottom, begin 'ST: ' |
| 8. source, begin ' ', end punct '' | 20. subject, line bottom, begin 'Subjects: ', number |
| 9. place, begin ' ', end ': ' | 21. geog, line bottom, number, begin 'Geographical areas: ' |
| 10. publish, end ', ' | 22. accno, line bottom, begin '[Acc. no. ', End '] |
| 11. date, end punct '' | |
| 12. collat, begin ' ', end punct '' | |

Sample Output

- 632.95 Epstein, Samuel S.; Legator, Marvin S. (Eds.)
EPS The mutagenicity of pesticides: concepts and evaluation.
Cambridge, Massachusetts: MIT Press, 1971. 220 p.
Subjects: 1. Pesticides 2. Toxicology 3. Mutation 4. Chemical
mutagenesis
[Acc. no. 21768]
- 631.47 Haans, J. C. F. M.; Steur, G. G. L. (Eds.)
HAA Progress in land evaluation. Rotterdam, Netherlands: A. A.
Balkema, 1984. 309 p.
Subjects: 1. Soil 2. Soil surveys
Geographical areas: 1. Europe
[Acc. no. 37088]

Continue? (Y/N) _

SHRTLIST Prepare search output in short bibliographic format to write to disk

Name of format: SHRTLIST
Name of data structure: AULIB
Date created: 06/03/88
Date last modified: 02/21/90

A. PAGE DEFINITION

Enter physical page length (number of lines): 0
Enter top margin (number of lines): 0
Enter bottom margin (number of lines): 0
Enter maximum page width (number of characters): 80
Enter number of blank lines between records: 1
Enter whether record may be broken across pages (Y/N): N
Enter whether underline characters should print as spaces (Y/N): N
Enter whether to pause between pages (Y/N): N

.....

E. RECORD LAYOUT

- | | |
|--|--|
| 1. callno, column 1 - 9, line 1, wordlist | 13. jourtit, begin ' ' |
| 2. @paragraph, column 11 - 78, line 1 | 14. jourcol |
| 3. author, separate '; ', end punct '' | 15. jourdate, begin '(', end ')' |
| 4. edcomp, begin '(', end ')' | 16. series, begin '(', end ')' |
| 5. @paragraph, column 11 - 78, indent 3, line
+ 1 | 17. hol, line bottom, indent 0 |
| 6. title, end punct '' | 18. pt, line bottom, begin 'PT: ' |
| 7. frq, begin '(', end ')' | 19. st, line bottom, begin 'ST: ' |
| 8. source, begin ' ', end punct '' | 20. subject, line bottom, begin 'Subjects: ',
number |
| 9. place, begin ' ', end ': ' | 21. geog, line bottom, number, begin
'Geographical areas: ' |
| 10. publish, end ' ', | 22. accno, line bottom, begin '[Acc. no. ',
End ']' |
| 11. date, end punct '' | |
| 12. collat, begin ' ', end punct '' | |

Sample Output

- 589.2 Krassilnikov, N. A.
KRA Ray fungi: higher forms. New Delhi, India: Amerind, 1981.
1497 p.
Subjects: 1. Fungi 2. Biology 3. Actinomycetales 4. Classification
[Acc. no. 44839]
- 631.41 Bolt, G. H. (Gerard H.); Bruggenwert, M. G. M. (Eds.)
BOL Soil chemistry. New York: Elsevier Scientific, 1976. 281 p.
(Developments in soil science; v. 5 A-B)
Subjects: 1. Soil chemistry
[Acc. no. 23361]
- 664.9 Fabbriante, Thomas; Sultan, William J.
FAB Practical meat cutting and merchandising. Westport: AVI, 1978.
2 vols. (AVI soft cover textbook series)
Subjects: 1. Meat cutting
[Acc. no. 28447]

LONGLIST Prepare search output in bibliographic format with abstract to write to disk

Name of format: LONGLIST
Name of data structure: AULIB
Date created: 06/03/88
Date last modified: 02/21/90

A. PAGE DEFINITION

Enter physical page length (number of lines): 0
Enter top margin (number of lines): 0
Enter bottom margin (number of lines): 0
Enter maximum page width (number of characters): 80
Enter number of blank lines between records: 1
Enter whether record may be broken across pages (Y/N): N
Enter whether underline characters should print as spaces (Y/N): N
Enter whether to pause between pages (Y/N): N
.....

E. RECORD LAYOUT

- | | |
|--|--|
| 1. callno, column 1 - 9, line 1, wordlist | 14. jourcol |
| 2. @paragraph, column 11 - 78, line 1 | 15. jourdate, begin '(', end ')' |
| 3. author, separate ';', end punct '' | 16. series, begin '(', end ')' |
| 4. edcomp, begin '(', end ')' | 17. hol, line bottom, indent 0 |
| 5. @paragraph, column 11 - 78, indent 3, line
+ 1 | 18. pt, line bottom, begin 'PT: ' |
| 6. title, end punct '' | 19. st, line bottom, begin 'ST: ' |
| 7. frq, begin '(', end ')' | 20. note, line bottom, separate ' ' |
| 8. source, begin ' ', end punct '' | 21. subject, line bottom, begin 'Subjects: ',
number |
| 9. place, begin ' ', end ': ' | 22. geog, line bottom, number, begin
'Geographical areas: ' |
| 10. publish, end ' ', | 23. accno, line bottom, begin '[Acc. no. ',
End ']' |
| 11. date, end punct '' | 24. abstr, line bottom, begin 'AB: ', indent 2 |
| 12. collat, begin ' ', end punct '' | |
| 13. jourtit, begin ' ' | |

Sample Output

589.2 Krassilnikov, N. A.
KRA Ray fungi: higher forms. New Delhi, India: Amerind, 1981. 1497 p.
Published for the Agricultural Research Service, United States
Department of Agriculture and the National Science Foundation,
Washington, D. C. Translated from the Russian.
Subjects: 1. Fungi 2. Biology 3. Actinomycetales 4. Classification
[Acc. no. 44839]
AB: Contents: v. 1. Biology and classification -- v. 2. Class
actinomycetes. Pt. 1 Actinomycetaceae -- v. 2. Class actinomycetes.
Pt. 2. Micromonosporaceae, Streptosporangiaceae, Actinoplanaceae,
Planosporaceae, Dermatophilaceae.

Annex 2

Directory of Serials in the NWFP Agricultural University Library

Compiled by

Naeemullah Khan

and

Attaullah



Library
Northwest Frontier Province Agricultural University

Peshawar, Pakistan

March 1990

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Foreword

This publication documents the diligent efforts of the head librarian and librarian in charge of serials at the NWFP Agricultural University to organize and manage the many serials received in the library. The library has grown from its beginnings as the library of the Department of Agriculture in Islamia College in 1933 to its present status in an autonomous university. Subscriptions to journals have been intermittent throughout this period resulting in scattered holdings. This is the first time that a complete inventory of serial holdings has been attempted. It presents the first major step to providing timely access to serials available in the University Library.

The compilers are to be commended for the time and care given to preparing complete and accurate entries for the serials. In gathering data for the directory, systems were established so that new titles may be regularly added to maintain an up-to-date database of serials. It is planned that this database will provide the basis for adding holdings from other agricultural institute libraries in the Northwest Frontier Province. As other libraries' holdings are added, a new edition of the directory will be published.

I would recommend that other libraries wishing to undertake such a project would benefit greatly from discussions with the two compilers of this directory. Their insight into the processes required for implementing and maintaining such a system would be quite valuable.

Finally, I wish to congratulate Mr. Naeemullah Khan and Mr. Attaullah for their conscientious efforts and encourage them to maintain the quality of work that is exhibited in this directory in their future endeavors.

Jane S. Johnson
Information Consultant
Tipan Project
University of Illinois

Acknowledgements

I express my sincere appreciation to Mrs. Jane S. Johnson, Information Consultant, TIPAN Project, for providing her expertise, technical assistance and constant supervision and revision of the data input by Mr. Naeemullah who worked hard in making the publication of this directory possible.

In the end, I thank the Vice-Chancellor, Mr. Adbur Rehman Khan, for his encouragement and support in producing this publication.

Knowing the fact that nothing is perfectly produced and there is always room for improvement, we hope to periodically update this publication with continuous efforts to improve its quality and coverage. We welcome any comments and suggestions for improving the style, quality, and coverage of this publication.

Attaullah
Librarian

Introduction

The knowledge and availability of existing resources is an essential prerequisite for conducting research and designing strategy for development and progress. Realizing this factor and the consistent desire of the Agricultural University Library users, Mr. Naeemullah, Serials Incharge, was assigned the task of compiling the serials holdings available in the AU Library in the summer of 1989.

It gives us great pleasure to produce the first ever directory of our serials holdings. We have tried to provide the complete holdings of serial titles available in the AU Library. In this first attempt, information is included on all journal titles, irregular and annual series, as well as some monographic serials available in the AU Library.

The purpose of this publication is to inform our patrons of the AU serial collection and to distribute this among other libraries to create an environment conducive for sharing library resources, in particular, and producing a union list of serial holdings available in agriculture libraries in the Northwest Frontier Province.

Entries in this directory are arranged in alphabetical order by title. A list of abbreviations is included to assist the readers in understanding entries. Finally, an alphabetical list of titles under each location code is presented to aid users in locating the serials in the library.

Sample Entry

<p>Title</p> <p>Place, Publisher</p> <p>Frequency</p> <p>Call Number</p> <p>Previous Title</p> <p>Superseded Title</p> <p>Holdings</p>	<p>Human nutrition. Food sciences and nutrition (0308-4329)</p> <p>London, John Libbey. Vol. 41F, 1987</p> <p>Freq: Q [s 114]</p> <p>CN: AGRCHEM</p> <p>PT: Journal of plant foods, 0142-968X</p> <p>ST: Food sciences and nutrition</p> <p>Note: Title varies: Food sciences and nutrition. Issued as a companion volume and with compatible numbering to Human nutrition. Applied nutrition and Human nutrition. Clinical nutrition.</p> <p>AU: v. 41F (1987) [missing: v.41F:3 (1987)]</p>	<p>ISSN (International Standard Serial Number)</p> <p>Publication Date</p> <p>Notes</p> <p>Missing Issues</p>
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Abbreviations

Location Codes for Serials

AGRCHEM	Agricultural Chemistry and Human Nutrition
AGRECON	Agricultural Economics, Rural Sociology and Extension Education
AGRMECH	Agricultural Mechanization and Water Management
AGRON	Agronomy
ANIMSCI	Animal Science
ENTOMOL	Entomology
FOODTECH	Food Science and Technology
GENAGR	General Agriculture
GENSCI	General Sciences
HORT	Horticulture
ISLAM	Islamic and Pakistan Studies
MATHSTAT	Mathematics, Statistics and Computer Science
MISC	Miscellaneous
PBG	Plant Breeding and Genetics
PLANTPATH	Plant Pathology
PLANTPROT	Plant Protection
SOILSCI	Soil Science

Frequency Codes

M	Monthly
A	Annually
Bi-a	Biannually or Biennially
Bi-mo	Bi-monthly
Q	Quarterly
Semi-a	Semi-annually
Semi-mo	Semi-monthly
Irreg	Irregularly
W	Weekly

Directory of Serials in the NWFP Agricultural University Library

Abstracts of working papers in economics

(0951-0079)

New York, Cambridge University Press. Vol. 1-1986- Freq: Q [s 60]

CN: AGRECON

Note: The official journal of the AWPE database.

AU: v. 3 (1988)

Freq: A [s 172]

CN: 574.1925 NOR

PT: Advances in enzymology and related subjects 0196-7398

ST: Advances in enzymology and related areas of molecular biology 0065-258X

Note: Editor: <1959-> F. F. Nord.

AU: v. 21 (1959)

Advances in agronomy (0065-2113)

New York, Academic Press. Vol. 1- 1949-

Freq: A [s 155]

CN: 630 BRA

Note: Vols. for 19<76-> prepared under the auspices of the American Society of Agronomy. Indexes: vol.32, Cumulative indexes for volumes 1-30. Editors: Vol. 1- A. G. Norman; <vol. 37>- N. C. Brady.

AU: v. 14 (1962); v. 29-33 (1977-1980); v. 37 (1984)

Advances in food research (0065-2628)

New York, Academic Press. Vol. 1- 1948-

Freq: Irreg [s 147]

CN: 664 ADV

Note: Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Chemical abstracts 0009-2258 Indexes: Vols. 1-10, 1948-60, with v. 11. Editor: <vol. 28>- C. O. Chichester

AU: v. 11-12 (1962-1963), v. 28-30 (1982-1986)

Advances in applied biology (0735-3480)

London, Academic Press. Vol. 6- 1981-

Freq: A [s 175]

CN: 574 COA

PT: Applied biology 0197-1352

Note: Editor: 1981- T. H. Coaker.

AU: v. 6 (1981)

Advances in genetics (0065-2660)

New York, Academic Press. Vol. 1- 1947-

Freq: Irreg [s 148]

CN: 575.1 ADV

Note: Has supplement: Advances in genetics. Supplement, 0065-2679 Indexed by: Biological abstracts 0006-3169 Indexed selectively by: Bibliography of agriculture 0006-1530 Editor: v. 1- M. Demerec; <1962>- E. W. Caspari; <1984>- J. G. Scandalios.

AU: v. 1-11 (1947-1962), v. 15-20 (1970-1975), v. 22 (1983)

Advances in applied microbiology (0065-2164)

New York, Academic Press. Vol. 1- 1959-

Freq: Irreg [s 178]

CN: 576 UMB

Note: Editor: 1959- W. W. Umbreit.

AU: v. 4 (1962)

Advances in human genetics (0065-275X)

New York, Plenum Press. Vol. 1- 1970-

Freq: Irreg [s 153]

CN: 574 HAR

Note: Editors: v. 1- H. Harris and K. Hirschhorn.

AU: v. 1 (1970)

Advances in carbohydrate chemistry and biochemistry (0065-2318)

New York, Academic Press. Vol. 24 1969-

Freq: A [s 151]

CN: 612.015 TIP

PT: Advances in carbohydrate chemistry

Note: Editor: <v. 42, 1984>- R. S. Tipson

AU: v. 42 (1984)

Advances in insect physiology (0065-2806)

New York, Academic Press. Vol. 1- 1963-

Freq: A [s 154]

CN: 595.701 ADV

Note: Editors: Vol. 1- J. W. L. Beament, J. E. Treherne and V. B. Wigglesworth; <vol. 15>- Berridge, Michael J. Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258

AU: v. 9-10 (1971-1972), v. 12-19 (1976-1986)

Advances in cereal science and technology

St. Paul, Minnesota, American Association of Cereal Chemists. Vol. 1- 1976- Freq: A [s 179]

CN: 664.7 ADV

AU: v. 1-9 (1976-1988)

Advances in enzymology and related subjects of biochemistry (0096-5316)

New York, Interscience. Vol. 3-28, 1943-1966

- Advances in meat research (0885-2405)**
Westport, Connecticut, AVI. Vol. 1- 1985-
Freq: A [s 149]
CN: 664.9 PEA
AU: v. 2 (1986)
- Advances in pest control research (0568-0107)**
New York, Interscience. Vol. 1-8, 1957-1968
Freq: Irreg [s 163]
CN: 632.9 MET
Note: Editor: v. 1- R. L. Metcalf.
AU: v. 1-4 (1957-1962)
- Advances in plant pathology**
London, Academic Press. Vol. 1- 1982-
Freq: Irreg [s 49]
CN: 581.2 ING
Note: Editors: 1982- D. S. Ingram and P. H. Williams Vol. 4 has unique title Genetics of pathogenicity factors: application to phytopathogenic bacteria by Arun K. Chatterjee and Anne K. Vidaver.
AU: v. 1-5 (1982-1986)
- Advances in research and technology of seeds (0376-7329)**
Wageningen, Netherlands, Centre for Agricultural Publishing and Documentation, PUDOC. Pt. 1- 1975- Freq: A [s 150]
CN: 631.521 ADV
Note: Intended as a successor to the International Seed Testing Association Seed Bibliography. Edited for the International Seed Testing Association Editor: pt. 1, W. J. Bradnock; pt. 2- Thomson, J. R. Indexed selectively by: Chemical abstracts 0009-2258
AU: pt. 1-9 (1975-1984)
- Agricultural economics**
Amsterdam, Elsevier. Vol. 1- 1987- Freq: Q [s 241]
CN: AGRECON
AU: v. 2 (1988)- [missing: v.2:2-3 (1988)]
- Agricultural engineering (0002-1485)**
St. Joseph, Michigan, American Society of Agricultural Engineers. Vol. 1- Sept. 1920-
Freq: Bi-mo [s 33]
CN: AGRMECH
AU: v. 68 (1987)- [missing: v. 68:3-7 (1987), v. 69:1,3,7 (1988)]
- Agricultural information development bulletin (0252-4376)**
Bangkok, United Nations Economic and Social Commission for Asia and the Pacific. Vol. 1- 1979- Freq: Q [s 268]
CN: GENAGR
AU: v. 10 (1988)- [missing: v.10:1-2 (1988)]
- Agricultural research**
Washington, DC, Agricultural Research Service, U.S. Dept. of Agriculture. Vol. 1- 1953-
Freq: 10 no. a year [s 267]
CN: GENAGR
AU: v. 36 (1988)- [missing: v.36:5-6,8-9 (1988)]
- Agriculture engineering abstracts (0308-8863)**
Farnham Royal, Slough, England, Commonwealth Agricultural Bureaux. Vol. 1- Jan/Mar. 1976- Freq: M [s 6]
CN: AGRMECH
Note: Some numbers issued in combined form.
AU: v. 11 (1986)- [missing: v.11:2-7,9 (1986), v.13:5 (1988)]
- Agronomy journal (0002-1962)**
Madison, Wisconsin, American Society of Agronomy. Vol. 41- Jan. 1949- Freq: Bi-mo [s 34]
CN: AGRON
PT: Journal (American Society of Agronomy)
Note: Indexed by Biological abstracts. Indexed by Nutrition abstracts and reviews.
AU: v. 50 (1958)- [missing: v.50:9,12 (1958), v.51 (1959), v.56:3 (1964), v.57:5 (1965), v.59:2-6 (1967), v.60-64 (1968-1972), v.65:5-6 (1973), v.66 (1974), v.68-72 (1976-1980), v.73:3-4 (1981), v.77 (1985), v.79:2 (1987)]
- AID research and development abstracts (0096-1507)**
Washington, DC, U.S. Agency for International Development. Freq: Q [s 239]
CN: MISC
AU: v. 14 (1988)- [missing: v.14:1-2 (1988)]
- Al-balagh**
Karachi, Al-balagh Darululum Karachi. Vol. 1- 1966- Freq: M [s 271]
CN: ISLAM
AU: v. 23 (1989)- [missing: v.23:5 (1989)]
- Al-bayynat**
Karachi, Jameatul-ulum-i-Islamia. Vol. 1- 1948- Freq: M [s 270]
CN: ISLAM
AU: v. 51 (1989)- [missing: v.51:5 (1988), v.52:2,4 (1989)]
- Al-haq**
Akora Khattak, Peshawar, Darululum-i-Haqania. Vol. 1- 1966- Freq: M [s 217]
CN: ISLAM
AU: v. 24 (1989)
- Al-tauheed (0267-968x)**
Tehran, Sazman-a-Tablighat-e-Islami. Vol. 1- 1984- Freq: Q [s 248]
CN: ISLAM
AU: v. 5 (1988)- [missing: v.5:1-2 (1988)]

- AMA: Agricultural mechanization in Asia**
(0084-5841)
Tokyo, Farm Machinery Industrial Research Corp. Vol. 1-11, 1970-1980 Freq: Q [s 133]
CN: AGRMECH
ST: AMA: Agricultural mechanization in Asia, Africa and Latin America
Note: International specialized media for agricultural mechanization in Asian developing countries. Published in cooperation with Shin-Norinsha Co. and the International Farm Mechanization Research Service.
AU: v. 2-10 (1971-1979) [missing: v.2:2-4 (1971), v.3:2-4 (1972), v.4:1,3-4 (1973), v.5-6 (1974-1975), v.7:1-3 (1976), v.8:1 (1977), v.9:1,3 (1978), v.10:2-4 (1979)]
- AMA: Agricultural mechanization in Asia, Africa and Latin America** (0084-5841)
Tokyo, Farm Machinery Industrial Research Corp. Vol. 12, no. 1- Winter 1981- Freq: Q [s 134]
CN: AGRMECH
PT: AMA: Agricultural mechanization in Asia
Note: Published in cooperation with Shin-Norinsha Co. and the International Farm Mechanization Research Service. Indexed selectively by: Bibliography of agriculture 0006-1530
AU: v. 12 (1981)- [missing: v.12:1-2,4 (1981), v.13:1-3 (1982), v.14:2-4 (1983), v.15 (1984), v.17:1-2,4 (1986)]
- American bee journal** (0002-7626)
Hamilton, Dadant and Sons. Vol. 1- 1861- Freq: M [s 266]
AU: v. 125 (1985)- [missing: v.127-128 (1987-88)]
- American journal of agricultural economics** (0002-9092)
St. Paul, Minnesota, American Agricultural Economics Association. Vol. 50- Feb. 1968- Freq: 5 no. a year [s 1]
CN: AGRECON
PT: Journal of farm economics
Note: Vols. for <1982- > include the proceedings of the annual meeting of the American Agricultural Economics Association. Vols. for 1984- have special biennial issue called: Directory of the American Agricultural Economics Association.
AU: v. 63 (1981)- [missing: v.65 (1983), v.68-69 (1986-1987), v.70:5 (1988)]
- American journal of clinical nutrition** (0002-9165)
New York, Journal of Clinical Nutrition, Inc. Vol. 2, no. 4- July-Aug. 1954- Freq: M [s 36]
- CN: AGRCHEM**
Note: Supplements accompany some issues.
AU: v. 35 (1982)- [missing: vs.41-42 (1985)] v.47 : 4,6 (1988)]
- The American journal of economics and sociology** (0002-9246)
New York, American Journal of Economics and Sociology, Inc. Vol. 1- Oct. 1941- Freq: Q [s 37]
CN: AGRECON
AU: v. 32 (1973)- [missing: v.34-39 (1975-80), v.42-44 (1983-85), v.45:4 (1986), v.47:1 (1988)]
- American potato journal** (0003-0589)
Washington, DC, Potato Association of America. Vol. 1- 1926- Freq: M [s 68]
CN: AGRON
PT: Potato news bulletin
Note: Indexed by Biological abstracts
AU: v. 66 (1989)-
- American scientist**
Easton, Pennsylvania, Society of the Sigma Xi. Vol. 1- 1913- Freq: Bi-mo [s 265]
CN: GENSCI
AU: v. 76 (1988)- [missing: v.76:1-4 (1988)]
- Analytical methods for pesticides and plant growth regulators** (0091-7486)
New York, Academic Press. Vol. 6- 1972- Freq: Irreg [s 168]
CN: 632.95 ZWE
PT: Analytical methods for pesticides, plant growth regulators, and food additives 0570-0035
Note: Editors: 1972- G. Zweig, J. Sherma. Each volume also has a distinctive title. Indexed selectively by: Chemical abstracts 0009-2258
AU: v. 6-11 (1973-1981)
- Analytical methods for pesticides, plant growth regulators, and food additives** (0570-0035)
New York, Academic Press. Vol. 1-5, 1963-1967 Freq: Irreg [s 161]
CN: 632.95 ZWE
ST: Analytical methods for pesticides and plant growth regulators, 0091-7486
Note: Edited by Gunter Zweig.
AU: v. 1-5 (1963-1967)
- Animal feed science and technology** (0377-8401)
Amsterdam, Elsevier. Vol. 1- Apr. 1976 [s 40]
CN: ANIMSCI
Note: Indexed by Biological abstracts.
AU: v. 22 (1988)-
- Animal research and development**
Tubingen, West Germany, Institute for Scientific

- Co-operation. Freq: Semi-a [s 264]
 CN: ANIMSCI
 AU: v. 27 (1988)-
- Annals of the Entomological Society of America**
 (0013-8746)
 College Park, Maryland, Entomological Society
 of America. vol. 1- Mar. 1908- Freq:
 Bi-mo [s 45]
 CN: ENTOMOL
 Note: Includes list of members in vols. 1, 5, 8.
 Available on microfilm from Microfilm
 International.
 AU: v. 74 (1981)- [missing: v.75 (1982),
 v.76:1,2 (1983)]
- Annual report of river and climatological data of
 West Pakistan** (0066-4073)
 Lahore, Water and Power Development
 Authority, Water and Soils Investigation
 Division, Surface Water Circle. 1960-1970
 Freq: A [s 185]
 CN: 551.35 WAT
 ST: Annual report of river and climatological
 data of Pakistan
 Note: Issuing body varies: Surface water Circle
 (1960-1964); Surface Water Hydrology
 Project (1965-1970). Issued in 2 vols.
 (1963-1965); 3 vols. (1966-).
 AU: 1968
- Annual review of entomology** (0066-4170)
 Palo Alto, California, Annual Reviews, Inc. Vol.
 1- 1956- Freq: A [s 41]
 CN: 595.7 ANN
 Note: Includes bibliographies. Indexed by
 Biological abstracts. Editors: Ray F. Smith,
 Edward A. Steinhaus, Thomas E. Mittler,
 etc.
 AU: v. 1-26 (1950-1981), v. 31-34 (1986-1989)
- Annual review of plant physiology** (0066-4294)
 Palo Alto, California, Annual Reviews, Inc. Vol.
 1-38, 1950-1987 Freq: A [s 173]
 CN: 581.1076 ARN
 ST: Annual review of plant physiology and plant
 molecular biology
 Note: Editors: 1950-55, D. I Arnon -- 1956, L.
 R. Blinks -- 1957-58, A. S. Crafts -- 1959-
 L. Machlis.
 AU: v. 2 (1951)
- Antenna** (0149-1890)
 London, Royal Entomological Society of
 London. Vol. 1- July 1977- Freq: Q [s
 101]
 CN: ENTOMOL
 PT: Journal of meetings (Royal Entomological
 Society of London) Proceedings (Royal
 Entomological Society of London)
 Note: Bulletin of the Royal Entomological
 Society of London.
 AU: v. 5 (1981)- [missing: v.7-8 (1983-1984)]
- Applied biology** (0197-1352)
 London, Academic Press. Vol. 1-5, 1976-1980
 Freq: A [s 174]
 CN: 574 COA
 ST: Advances in applied biology 0735-3480
 Note: Editor: 1976-1980, T. H. Coaker.
 AU: v. 1-5 (1976-1980)
- Applied geography and development** (0173-7619)
 Tubingen, West Germany, Institute for Scientific
 Co-operation. Freq: Bi-a [s 263]
 CN: AGRECON
 AU: v. 21 (1983)- [missing: v.23-26
 (1984-1985), v.28:27 (1986), v.29-32
 (1987-1988)]
- ARIAL: A research journal of English language
 and literature** [s 240]
 AU: v. 11-12 (1985-1987)
- AUSSEN Politik: German foreign affairs review**
 (0004-8194)
 Hamburg, West Germany, Interpress Verlag.
 Freq: Q [s 272]
 CN: MISC
 AU: v. 39 (1988)- [missing: v.39:1-3 (1988)]
- Australian journal of agricultural research**
 (0004-9409)
 Melbourne, Commonwealth Scientific and
 Industrial Research Organization. Vol. 1-
 Jan. 1950- Freq: Bi-mo [s 71]
 CN: GENAGR
 Note: Vols. for Jan. 1950- published in
 collaboration with the Australian Institute of
 Agricultural Science and the Australian
 Veterinary Associatio; July 1977- by the
 Commonwealth Scientific and Industrial
 Research Organization and the Academy of
 Science. Indexed by Biological abstracts.
 AU: v. 12 (1961)- [missing: v.12:4 (1961),
 v.13:3,6 (1962), v.15-16:1,3-6 (1964-65),
 v.17-33 (1966-82), v.35:6 (1984), v.38:1-5
 (1987), v.39:6 (1988)]
- Biochemical preparations** (0067-8686)
 New York, Wiley. Vols. 1-13, 1949-1971 Freq:
 Irreg [s 176]
 CN: 612.015 BIO
 Note: Indexed by: Chemical abstracts 0009-2258
 Subject index: Vols. 1-12 with v. 12. Editor:
 1949- H. E. Carter and others; <19 >-
 Alton Meister; 1955- W. W. Westerfeld.
 AU: v. 1-9 (1949-1962)
- Biological abstracts** (0006-3169)
 Philadelphia, Pennsylvania, BioSciences
 Information Service of Biological Abstracts.

- Vol. 1- Dec. 1926- Freq: Semi-mo [s 102]
 CN: GENSCI
 AU: v. 73 (1982)
- Bioscience**
 Washington, DC, American Institute of Biological Sciences. Vol. 1- 1951- Freq: M [s 262]
 CN: GENSCI
 AU: v. 38 (1988)- [missing: v.38:1-10,11 (1988),
- The British journal of nutrition (0007-1145)**
 Cambridge, Cambridge University Press. Vol. 1- Sept. 1947- Freq: Bi-mo [s 70]
 CN: AGRCHEM
 Note: Indexed by Biological abstracts. Vols. 1-6 contain proceedings of the Nutrition Society, Feb. 1947-May 1952.
 AU: v. 45 (1981)
- Bulletin of the Entomological Society of America (0013-8754)**
 College Park, Maryland, Agricultural Institute of America. Freq: Q [S 261]
 CN: ENTOMOL
 AU: v. 29-33 (1983-1987) [missing: v.30:1,4 (1984), v.32:3-4 (1986)]
- Byte (0360-5280)**
 Peterborough, New Hampshire, Byte Publications. Vol. 1- Sept. 1975- Freq: M [s 145]
 CN: MATHSTAT
 Note: The small systems journal.
 AU: v. 13 (1988)- [missing: v.13: 1-4,7 (1988)]
- The Canadian entomologist (0008-347X)**
 Ottawa, Entomological Society of Canada. Vol. 1- Aug. 1868- Freq: M [s 103]
 CN: ENTOMOL
 Note: Published by the Entomological Society of Canada (1863-1871), Aug. 1868-Dec. 1870; by the Entomological Society of Ontario, Apr. 1871-Dec. 1950; co-published by the Entomological Society of Canada (1951-) and the Entomological Society of Ontario, Jan. 1951-May 1961; by the Entomological Society of Canada (1951-), June 1961- . Official organ of the Entomological Society of Canada (1951-), June 1961- . Has supplement: Canadian entomologist. Supplement.. 1955-56, ISSN 0700-5415. Indexed by: Biological abstracts 0006-3169 Indexed by: Selected water resources abstracts 0037-136X Indexed by: Bibliography of agriculture 0006-1530 Indexed selectively by: Chemical abstracts 0009-2250 Includes some text in French. Irregular, Aug. 1869-dec. 1871; monthly,
- 1868, 1872-
 AU: v. 117 (1985)- [missing: v.119 (1987)]
- Canadian Institute of Food Science and Technology Journal (0315-5463)**
 Toronto, Pergamon Press. Vol. 5- Jan. 1972- Freq: Q [s 3]
 CN: FOODTECH
 PT: Canadian Institute of Food Technology journal
 Note: Includes institute news and reports of its conferences, institutes, and section meetings. Indexed selectively by Biological abstracts.
 AU: v. 15 (1982)- [missing: v.18 (1985), v.19:1,2,4 (1986)]
- Canadian journal of genetics and cytology (0008-4093)**
 Ottawa, Genetics Society of America. Vol. 1-28, Jul. 1959-1986 Freq: Bi-mo [s 42]
 CN: PBG
 ST: Genome
 Note: Includes bibliographies and some text in French. Indexed by Biological abstracts. Issued 1959-1982 by the Genetics Society of Canada; 1983-1986, by the National Research Council Canada.
 AU: v. 26-28 (1984-1986) [missing: v.28:3-5 (1986)]
- Canadian journal of plant science (0366-6557)**
 Ottawa, Agriculture Institute of Canada. Vol. 37- Jan. 1957- Freq: Q [s 4]
 CN: AGRON
 PT: Canadian journal of agricultural science
 Note: Published with the cooperation of the Canadian Society of Agronomy and the Canadian Society for Horticultural Science. Indexed selectively by Biological abstracts. Supersedes in part: Canadian journal of agricultural science.
 AU: v. 63 (1983)- [missing: v.65 (1985), v.67:1,2 (1987)]
- Canadian journal of plant science and cytology (0008-4220)**
 Ottawa, Agricultural Institute of Canada. Vol. 1- 1921- Freq: Q [s 214]
 CN: PBG
 AU: v. 25 (1983)- [missing: v.27 (1985), v.28:3-5 (1986),
- Census report of N.W.F.P (1981)**
 Islamabad, Population Census Organisation. June, 1983 Freq: Every ten years [s 260]
 Note: It publishes after every ten years
 AU: v. 1981-
- Cereal chemistry (0009-0352)**
 St. Paul, Minnesota, American Association of Cereal Chemists. Vol. 1- Jan. 1924- Freq:

- Bi-mo [s 5]
 CN: AGRCHEM
 PT: Journal of the American Association of Cereal Chemists
 Note: Includes papers delivered at the annual meetings of the American Association of Cereal Chemists. Indexed selectively by Biological abstracts.
 AU: v. 50 (1973)- [missing: v.52-53 (1975-76), v.56-59 (1979-82), v.62 (1985), v.64:2,3,5 (1987)]
- Chemistry of heterocyclic compounds (0069-3154)**
 New York, Wiley-Interscience. Vol. 1- 1950-
 Freq: Irreg [s 164]
 Note: Editor: v. 1- Klaus Hofmann.
 AU: v. 1-15 (1950-1961), v. 17 (1962), v. 20 (1964)
- Chromosoma (0009-5915)**
 New York, Springer-Verlag. Vol. 3- 1948-
 Freq: Bi-mo [s 104]
 CN: PBG
 PT: Zeitschrift für zellforschung und mikroskopische Anatomie. Abt. B
 Note: Suspended publication 1944-47. Indexed by: Biological abstracts 0006-3169 Indexed by: Bibliography of agriculture 0006-1530 Indexed selectively by: Chemical abstracts 0009-2258
 AU: v. 4 (1950)- [missing: v.89:6 (1983), v.89:6 (1984), v.91-94 (1985-86), v. 96:1 (1988)]
- Communications in soil science and plant analysis (0010-3624)**
 New York, M. Dekker. Vol. 1- Jan. 1970-
 Freq: M [s 105]
 CN: SOILSCI
 Note: Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258 Six no. a year; 10 no. a year, 1978; 12 no. a year, 1979-
 AU: v. 14 (1983)- [missing: v.15:12 (1984)]
- Crop protection (0261-2194)**
 Guildford, Surrey, Butterworths. Vol. 1- 1982-
 Freq: Bi-mo [s 259]
 CN: PLANTPROT
 Note: Indexed by Scientific review Indexed by Science citation Indexed by Risk abstracts
 AU: v. 8 (1989)-
- Crop science (0011-183x)**
 Madison, Wisconsin, Crop Science Society of America. Vol. 1- Jan./Feb. 1961- Freq: Bi-mo [s 65]
 CN: AGRON
 Note: Indexed by Biological abstracts.
 AU: v. 4 (1964)- [missing: v.6-12 (1966-72), v.13:6 (1973), v.14:2-6 (1974), v.15:1, 6 (1975), v.16-17 (1976-77), v.19:2-6 (1979), v.20 (1980)]
- Dairy goat journal (0011-5592)**
 Monona, Wisconsin, Schroeder Publications.
 Vol. 1- 1916- Freq: M [s 258]
 CN: ANIMSCI
 AU: v. 66 (1988)- [missing: v.66:3-4,6,8 (1988)]
- Development (1011-6370)**
 Rome, Society for International Development.
 1959- Freq: Q [s 43]
 CN: AGRECON
 PT: International development review
 AU: 1988- [missing: 1988:1, 1989:1]
- Developments in food microbiology**
 New York, Elsevier. Vol. 1- 1982- Freq: Irreg [s 157]
 CN: 664.0576 ROB
 Note: Editor: <Vol. 2>- R. K. Robinson.
 AU: v. 2 (1986)
- Developments in food preservation (0263-4376)**
 New York, Elsevier. Vol. 1- 1981- Freq: Irreg [s 171]
 CN: 641.4 THO
 Note: Editor: 1981- Stuart Thorne.
 AU: v. 4 (1987)
- East Pakistan annual**
 Chittagong, Tempest House. Vol. 1-4, 1961-1966/67 Freq: Irreg [s 177]
 CN: 954 NUR
 Note: Editor: <1962-> Nurul Islam
 AU: v. 2 (1962)
- Ecology of food and nutrition (0367-0244)**
 New York, Gordon and Breach. Vol. 1- 1971-
 Freq: Q [s 106]
 CN: FOODTECH
 Note: Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Bibliography of agriculture 0006-1530
 AU: v. 23 (1989)
- Econometrica (0012-9682)**
 Chicago, Econometric Society, University of Chicago. Vol. 1- Jan. 1933- Freq: Bi-mo [s 44]
 CN: MATHSTAT
 AU: v. 54 (1986)- [missing: v. 54:1,4,5 (1986), v.55:1,6 (1987), v.56:1,3-6 (1988)]
- Entomologia experimentalis et applicata (0013-8703)**
 Amsterdam, North-Holland. Vol. 1, no. 1- Feb. 1958- Freq: Bi-mo [s 107]
 CN: ENTOMOL
 Note: Indexed by: Bibliography of agriculture 0006-1530 Indexed by: Biological abstracts 0006-3169 Indexed by: Chemical abstracts

- 0009-2258 Published in 2 vols. of 3 issues.
AU: v. 33 (1973)
- Entomophaga**
Paris, Lavoisier Abonnements. Vol. 1- 1956-
Freq: Q [s 188]
CN: ENTOMOL
AU: v. 31 (1986)- [missing: v.32:4 (1987)]
- Environmental entomology (0046-225x)**
College Park, Maryland, Entomological Society
of America. Vol. 1- Feb. 1972- Freq:
Bi-mo [s 46]
CN: ENTOMOL
Note: Indexed by Biological abstracts.
AU: v. 1 (1972)- [missing: v.1:1 (1972), v.14
(1985), v.15:3-4 (1986), v.16:1-4 (1987)]
- European journal of clinical nutrition (0954-3007)**
Hampshire, England, Macmillan. Freq: M [s
192]
CN: AGRCHEM
PT: Human nutrition
AU: v. 40 (1986)-
- Extension review (0162-9875)**
Washington, DC, Science and Education
Administration. Vol. 49, no. 2- Mar./Apr.
1978- Freq: Q [s 7]
CN: AGRECON
PT: Extension service review
Note: Publication of the Cooperative Extension
Service, U. S. Dept. of Agriculture and state
land-grant colleges and universities. Issued
Mar./Apr. 1978-spring 1981 by the Science
and Education Administration; summer 1981-
by the Extension Service.
AU: v. 59 (1989)-
- Farm journal (0014-8008)**
Philadelphia, Pennsylvania, Farm Journal Inc.
Vol. 1- 1876- Freq: M [s 256]
CN: GENAGR
Note: It is published monthly except semi-m in
Jan, Feb, & March and Bi-m in June & July
AU: v. 110 (1986)- [missing: v.110:1-11 (1986),
v.111:1-2,4-9,14 (1987), v.112:3,5,9 (1988)]
- Farm mechanization directory**
London, Temple Press Books. 1st-9th ed.;
1951-1963 Freq: Irreg [s 160]
CN: 631.3 FAR
ST: Farm equipment directory and handbook,
0430-0769
Note: Published in association with Farm
mechanization (later called Farm
mechanization and buildings
AU: 9th ed. (1963)
- FASEB journal (0892-6638)**
Bethesda, Maryland, Federation of American
Societies for Experimental Biology. Vol. 1-
1987- Freq: M [s 255]
CN: GENSCI
Note: Official publication of the Federation of
America Societies for Experimental Biology.
Published monthly except 3 issues in
February.
AU: v. 3 (1989)-
- Field crop abstracts (0015-069X)**
Farnham Royal, Slough, England,
Commonwealth Agricultural Bureaux. Vol. 1-
Jan. 1948- Freq: M [s 108]
CN: AGRON
Note: Prepared by the Commonwealth Bureau
of Pastures and Field Crops Bimonthly,
1948-49; Quarterly, 1950-72; Monthly, 1973-
AU: v. 3 (1950)- [missing: v.17-26 (1964-73),
v.27:1-3,5 (1974), v.28-33 (1975-80), v.40
(1987)]
- Field crop research (0378-4290)**
Amsterdam, Elsevier. Vol. 1- 1977- Freq: Q
[s 209]
CN: AGRON
Note: Indexed by: Current contents Indexed by:
Field crop abstracts
AU: v. 10 (1985)-
- Food chemistry (0308-8146)**
London, Applied Science. Vol. 1- July 1976-
Freq: Q [s 109]
CN: FOODTECH
AU: v. 10 (1983)-
- Food processing (0015-6523)**
Chicago, Putnam Pub. Co. Vol. 1- Sep. 1968-
Freq: M (semi-monthly in July) [s 47]
CN: FOODTECH
Note: The last issue for each quarter for 1968-
includes section: Foods for tomorrow.
AU: v. 11 (1950)- [missing: v. 20-47 (1959-86),
v.48:1-4,7-8 (1987), v.49:5 (1988)]
- Food processing guide and directory: ingredients,
equipment & supplies (0015-6523)**
Chicago, Putnam. 1981- Freq: A [s 180]
CN: 641.025 PUT
Note: Vols. for <1981/82-> published as the
July issue of Food Processing. Supplement
to: Food processing
AU: 1981/82
- Food science and technology abstracts (0015-6574)**
Shinfield, England, International Food
Information Service. Vol. 1- Jan. 1969-
Freq: M [s 48]
CN: FOODTECH
AU: v. 1 (1969)-

- Food technology (0015-6639)**
Chicago, Food Technology. Vol. 1- Jan. 1947-
Freq: M [s 11]
CN: FOODTECH
PT: Institute proceedings (Institute of Food Technologists) Newsletter (Institute of Food Technologists) Transactions (Institute of Food Technologists)
Note: Formed by the union of the Institute proceedings - Institute of Food Technologists, Newsletter, and Transactions.
AU: v. 1 (1947)- [missing: v.16-17 (1962-63), v.26 (1972), v.28-34 (1974-80), v.36 (1982), v.37:2,8-9,12 (1983), v.38:1 (1984), v.40:6-8,10-12 (1986)]
- Frontier journal of agricultural research**
Tarnab, Peshawar, Agricultural Research Institute. Vol. 1- 1974- Freq: Semi-a [s 254]
CN: GENAGR
AU: v. 1 (1974)- [missing: v.12-15 (1986-89)]
- Frozen foods (0265-6485)**
England, Retail Journals Ltd. Vol. 1- 1948-
Freq: M [s 191]
CN: FOODTECH
AU: v. 37 (1984)- [missing: v.38-42 (1985-1989)]
- Genetics (0016-6731)**
New York, Genetics Society of America. Vol. 1- 1916- Freq: M [s 189]
CN: PBG
Note: Indexed by: Biological abstracts Indexed by: Biological and Agricultural Index Indexed by: Chemical abstracts
AU: v. 48 (1963)- [missing: v.49:3-12 (1964), v.50-72 (1965-72), v.79-87 (1975-77), v.91-102 (1979-82)]
- Genome (0831-2796)**
Ottawa, National Research Council Canada. Vol. 29, no. 1- Feb. 1987- Freq: Bi-mo [s 110]
CN: PBG
PT: Canadian journal of genetics and cytology
AU: v. 29 (1987)- [missing: v.29:3,5-6 (1987)]
- Hamdard islamicus (0250-7196)**
Karachi, Hamdard Foundation Press. Vol. 1- 1978- Freq: Q [s 215]
CN: ISLAM
AU: v. 11 (1988)- [missing: v.11:1,3 (1988)]
- Hamdard medicus (0250-7188)**
Karachi, Hamdard Foundation Press. Vol. 1- 1958- Freq: Q [s 216]
CN: GENSCI
AU: v. 31 (1988)-
- Heredity: an international journal of genetics (0018-067X)**
Edinburgh, Longman Group. Vol. 1- July 1947- Freq: Bi-mo [s 72]
CN: PBG
Note: Indexed by Biological abstracts.
AU: v. 46 (1981)- [missing: v.47:3 (1981), v.48:2, v.49:2 (1982), v.50:2-3 (1983)]
- Horticultural abstracts (0018-5280)**
East Malling, England, Commonwealth Agricultural Bureaux. Vol. 1- Mar. 1931- Freq: M [s 111]
CN: HORT
Note: Vols. for 1931-37 issued by The Imperial Bureau of Fruit Production; 1938-47 by The Imperial Bureau of Horticulture and Plantation Crops; 1948-<78> by the Commonwealth Bureau of Horticulture and Plantation Crops. Indexes: Vols. 1-10, 1931-40; vols. 11-15, 1941-45; vols. 16-20, 1946-50; vols. 21-25, 1951-55; vols. 26-30, 1956-60. 1 v; vols. 31-35, 1961-65. 1 v. Quarterly, 1931-72; Monthly, 1973-
AU: v. 23 (1953)- [missing: v.57:2 (1987)]
- Horticultural reviews (0163-7851)**
Westport, Connecticut, AVI. Vol. 1- 1979- Freq: A [s 12]
CN: 635.05 JAN
Note: Co-sponsored by the American Society of Horticultural Sciences and the AVI Publishing Co.
AU: v. 1-9 (1979-1987)
- HortScience (0018-5345)**
Alexandria, Virginia, American Society for Horticultural Science. Vol. 1- Winter 1966- Freq: Bi-mo [s 8]
CN: HORT
Note: Indexed selectively by Biological abstracts.
AU: v. 16 (1981)- [missing: v.18-20 (1983-85), v.21:2-4 (1986), v.22:5 (1987)]
- Human nutrition. Applied nutrition (0263-8495)**
London, John Libbey. Vol. 36A-41A, 1982-1987 Freq: Bi-mo [s 112]
CN: AGRCHEM
PT: Journal of human nutrition
ST: European journal of clinical nutrition
Note: Title varies: Applied nutrition. Published in association with the British Dietetic Association. Associated with: Human nutrition. Food sciences and nutrition. Merged with: Human nutrition. Clinical nutrition to form: European journal of clinical nutrition. Continues in part: Journal of human nutrition, 0308-4329. Indexed selectively by: Chemical abstracts 0009-2258
AU: v. 40A (1986)

- Human nutrition. Clinical nutrition (0263-8290)**
 London, John Libbey. Vol. 36C-41C, 1982-1987
 Freq: Bi-mo [s 113]
 CN: AGRCHEM
 PT: Journal of human nutrition
 ST: European journal of clinical nutrition
 Note: Title varies: Clinical nutrition. Published in association with the British Dietetic Association. Associated with: Human nutrition. Food sciences and nutrition. Merged with: Human nutrition. Applied nutrition, to form: European journal of clinical nutrition. Continues in part: Journal of human nutrition, 0308-4329. Volume numbering assumed by: Human nutrition. Food sciences and nutrition. Indexed selectively by: Chemical abstracts 0009-2258
 AU: v. 40C (1986)
- Human nutrition. Food sciences and nutrition (0308-4329)**
 London, John Libbey. Vol. 41F, 1987 Freq: Q [s 114]
 CN: AGRCHEM
 PT: Journal of plant foods, 0142-968X
 ST: Food sciences and nutrition
 Note: Title varies: Food sciences and nutrition. Issued as a companion volume and with compatible numbering to Human nutrition. Applied nutrition and Human nutrition. Clinical nutrition.
 AU: v. 41F (1987)
- The Hunger Project papers (0743-6416)**
 Claremont, California, Hunger Project. No. 1-1984 Freq: Irreg [s 252]
 Note: Check in, then catalogue individual numbers as monographs.
 AU: No. 7 (1989)
- Indian farming**
 New Delhi, Indian Council of Agricultural Research. Freq: M [s 219]
 CN: GENAGR
 AU: v. 38 (1989)-
- Indian journal of agricultural research (0367-8245)**
 Karnal, Haryana, India, Agricultural Research Communication Centre. Vol. 5, no. 1-1971- Freq: Q [s 67]
 CN: GENAGR
 PT: Indian journal of science and industry. Section A: Agricultural sciences
 Note: Indexed by Biological abstracts.
 AU: v. 23 (1989)
- The Indian journal of genetics and plant breeding (0019-5200)**
 New Delhi, Indian Society of Genetics and Plant Breeding. Vol. 1- Dec. 1941- Freq: 3 no. a year. [s 73]
- CN: PBG
 Note: Indexed by Biological abstracts. An official publication of the Indian Society of Genetics and Plant Breeding.
 AU: v. 48 (1988)
- International goat and sheep research (0197-7393)**
 Scottsdale, Arizona, Dairy Goat Journal. Vol. 1, no. 1- spring 1980- Freq: Q [s 10]
 CN: ANIMSCI
- International review of cytology (0074-7696)**
 New York, Academic Press. Vol. 1- 1952- Freq: 2 vols. per year [s 162]
 CN: 547.87 BOU
 Note: Editors: v. 1- G. H. Bourne, J. F. Danielli. Issued under the auspices of the International Society for Cell Biology. Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258
 AU: v. 1-17 (1952-1964)
- International rice research newsletter**
 Manila, International Rice Research Institute. Vol. 1- 1976- Freq: Bi-mo [s 220]
 CN: AGRON
 AU: v. 13 (1988)-
- JARQ (0021-3551)**
 Tsukuba, Ibaraki, Japan, Tropical Agriculture Research Centre. Freq: Q [s 221]
 CN: GENAGR
 AU: v. 22 (1988)- [missing: v.22:1,3 (1988)]
- JASA: Journal of the American Statistical Association (0162-1459)**
 New York, American Statistical Association. Vol. 18- 1922- Freq: Q [s 39]
 CN: MATHSTAT
 AU: v. 81 (1986)- [missing: v.82:1 (1987), v.83:1 (1988)]
- Journal of agricultural and food chemistry (0021-8561)**
 Easton, Pennsylvania, American Chemical Society. Vol. 1- 1953- Freq: Bi-mo [s 117]
 CN: AGRCHEM
 Note: Place of publication varies. Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258 Indexed selectively by: Bibliography of agriculture 0006-1530 Biweekly, Apr. 1, 1953- ; bimonthly, <, Jan./Feb. 1976->
 AU: v. 26 (1978)- [missing: v.27:5,6 (1979), v.28 (1980), v.29:4-6 (1981), v.33-34 (1985-86), v.35:6 (1987), v.36:1 (1988)]

- Journal of agricultural engineering (0256-6524)**
Pantnagar, Uttar Pradesh, India, Indian Society of Agricultural Engineers. Freq: Q [s 14]
CN: AGRMECH
AU: v. 18 (1981)- [missing: v.18:1 (1981), v.19-21 (1982-83), v.23:1,4 (1986)]
- Journal of agricultural engineering research (0021-8634)**
London, Academic Press. Vol. 1- 1956- Freq: 8 no. a year [s 15]
CN: AGRMECH
Note: Vols. for (July 1984-) published for the British Society for Agricultural Engineering. Indexed selectively by Biological abstracts.
AU: v. 28 (1983)- [missing: v.29:1-2 (1984), v.31-32 (1985), v.33:1 v.35:4 (1986), v.37:2 (1987)]
- The journal of agricultural science (0021-8596)**
Cambridge, Cambridge University Press. Vol. 1- 1905/06- Freq: Bi-mo [s 116]
CN: GENAGR
Note: Edited for the plant breeding and animal nutrition research institutes at Cambridge, and the Rothamsted research institutes. Indexed by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258 Indexes: Vols. 1-20, 1905-30. 1 v.
AU: v. 98 (1982)- [missing: v.102:3 (1984), v.103:1 (1984)]
- Journal of American Dietetic Association (0002-8223)**
Chicago, American Dietetic Association. Vol. 1- June 1925- Freq: M [s 35]
CN: AGRCHEM
PT: Bulletin of the American Dietetic Association
Note: Vol. 10 has supplement with title: American Dietetic Association reports for 1933-34.
AU: v. 86 (1986)- [missing: v.86:2-5, 10-12 (1986), v.87:2, 12 (1987), v.88:8 (1988)]
- Journal of animal science (0021-8812)**
Champaign, Illinois, American Society of Animal Science. Vol. 1- Feb. 1942- Freq: M [s 69]
CN: ANIMSCI
PT: Record of proceedings of the annual meetings (American Society of Animal Production)
Note: Indexed by Biological abstracts.
AU: v. 1 (1942)-
- Journal of chemical ecology (0098-0331)**
New York, Plenum Press. Vol. 1- 1975- Freq: M [s 223]
- CN: AGRCHEM
AU: v. 15 (1989)-
- Journal of co-operative extension**
Madison, Wisconsin, Extension Journal, Inc. Freq: Q [s 224]
CN: AGRECON
AU: v. 1-4 (1963-1966), v. 12 (1974)
- The journal of dairy research (0022-0299)**
Cambridge, Cambridge University Press. Vol. 1- Nov. 1929- Freq: Q [s 123]
CN: ANIMSCI
Note: Issues for Dec. 1932- include Biennial reviews of the progress of dairy science. Vols. 1-4, 1929-May 1933, edited for the Dairy Research Committee of the Empire Marketing Board; vol. 5- Dec. 1933- , edited for the Committee of Management. Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258 Semiannual 1929-May 1933.
AU: v. 48 (1981)- [missing: v.48:4 (1981), v.50-52 (1983-85), v.55:4 (1988)]
- Journal of dairy science (0022-0302)**
Lancaster, Pennsylvania, American Dairy Science Association. Vol. 1- May 1917- Freq: M [s 125]
CN: ANIMSCI
Note: Official organ of the American Dairy Science Association (called in May 1917, American Society of Dairy Science). Beginning some vols. accompanied by supplement: Program; ADSA annual meeting and divisional abstracts. Vol. 43 accompanied by supplement: Symposium on Animal Reproduction [Paper]. Indexes: Vols. 1-20, 1917-37. 1 v. Vols. 21-30, 1938-47. 1 v. Bimonthly, 1927- <27>; monthly, 1934-
AU: v. 28 (1945)- [missing: v.71:11-12 (1965), v.30:2-3 (1947), v.33 (1950), v.44:3,8,9,11,12 (1961), v.45-63 (1962-80), v.67:2-6,8,10,11 (1984), v.71:2-8 (1988)]
- Journal of development studies**
Peshawar, Institute of Development Studies. Vol. 2- 1979- Freq: Irreg [s 124]
CN: AGRECON
PT: Peshawar journal of development studies
AU: v. 2 (1979)- [missing: v.3 (1980), v.6 (1983)]
- Journal of economic entomology (0022-0493)**
College park, Maryland, Entomological Society of America. Vol. 1- Feb. 1908- Freq: Bi-mo [s 9]
CN: ENTOMOL

- Note: Vols. for 1908-53 published by the American Association of Economic Entomologists; 1953 by the Entomological Society of America.
 AU: v. 34 (1941)- [missing: v.35-38 (1942-45), v.39:1 (1946), v.71 (1978), v.78 (1985), v.79:5,6 (1986), v.80:1-4 (1987)]
- Journal of economics education** (0094-2391)
 Madison, WI, American Society of Agronomy.
 Vol. 1- 1972- Freq: Semi-a [s 222]
 CN: AGRECON
 AU: v. 15 (1986)- [missing: v.17 (1988)]
- Journal of engineering and applied sciences**
 Peshawar, N.W.F.P. University of Engineering and Technology. Vol. 1, no. 1- Jan. 1982- Freq: Semi-a [s 126]
 CN: AGRMECH
 AU: v. 6 (1987)- [missing: v.6:1 (1987), v.7:1 (1988)]
- Journal of extension** (0022-0140)
 Madison, Wisconsin, Extension Journal, Inc.
 1963 Freq: Bi-mo [s 195]
 CN: AGRECON
 Note: Indexed by Current contents Indexed by World agricultural economics and rural sociology abstracts
 AU: v. 12 (1974)- [missing: v.12:1-2 (1974), v.15:3-4 (1977), v.16-19 (1978-81), v.20:1-2,5 (1982), v.21:2-4 (1983)]
- The journal of financial research** (0270-2592)
 Lubbock, Texas, College of Business Administration, Texas Technical University.
 Freq: Q [s 61]
 CN: AGRECON
 Note: The journal of the Southern Finance Association and the Southwestern Finance Association
 AU: v. 11 (1988)
- Journal of food science** (0022-1147)
 Champaign, Illinois, Institute of Food Technologists. Vol. 26, no. 1- Jan.-Feb. 1961- Freq: Bi-mo [s 16]
 CN: FOODTECH
 Note: An official publication of the Institute of Food Technologists.
 AU: v. 32 (1966)- [missing: v.32:2 (1967), v.35-42 (1970-77), v.44:5,6 (1978), v.45 (1979), v.47 (1982), v.50 (1985), v.51:4,5 (1986), v.52:2 (1987), v.53:1 (1988)]
- The journal of heredity** (0022-1503)
 Washington, DC, American Genetics Association. Vol. 5- Jan. 1914- Freq: M [s 128]
 CN: PBG
 PT: American breeders' magazine
- Note: An illustrated bimonthly publication devoted to plant genetics, animal genetics, and human heredity. Monthly, 1914-1950; bimonthly, Jan./Feb. 1951- Subtitle varies. Indexed by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258
 AU: v. 42 (1951)- [missing: v.45 (1954), v.59:1 (1968), v.60:6 (1969), v.62:2-6, v.63 (1972), v.64:3-6 (1973), v.66 (1975), v.68 (1977), v.69:1 (1978), v.70 (1979), v.71:4-6 (1980)]
- The journal of horticultural science** (0022-1589)
 England, Headley Bros. Vol. 1- 1919- Freq: Q [s 193]
 CN: HORT
 Note: Indexed by: Biological abstracts Indexed by: Chemical abstracts Indexed by: Current contents
 AU: v. 56 (1981)- [missing: v.58-59 (1983-84)]
- Journal of human nutrition and dietetics** (0952-3871)
 Oxford, Blackwell Scientific. Vol. 1- Feb. 1988- Freq: Bi-mo [s 196]
 CN: AGRCHEM
 AU: v. 1 (1988)-
- Journal of nematology** (0022-300x)
 College Park, Maryland, Society of Nematologists. Vol. 1- Jan. 1969- Freq: Q [s 64]
 CN: PLANTPATH
 Note: Has supplement: Annals of applied nematology, 1987.
 AU: v. 20 (1988)
- The journal of nutrition** (0022-3166)
 Philadelphia, Pennsylvania, Wistar Institute of Anatomy and Biology. Vol. 1- Sept. 1928- Freq: M [s 129]
 CN: AGRCHEM
 Note: Official organ of the American Institute of Nutrition. Vols. for 1928-33 published in Springfield, Ill. by C. C. Thomas. Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258 Vols. 7- <42> include the Proceedings of the annual meeting of the American Institute of Nutrition, 1st-9th, 11th- <14th>, 1934-42, 1947- <59> (1st-8th, 1934-41, issued as supplements to the journal). Indexes: Vols. 1-15, Sept. 1928-June 1938. 1 v.; Vols. 16-36, July 1938-1948. 1 v. Bimonthly, 1928-33; monthly, 1934-
 AU: v. 12 (1936)- [missing: v.20:5-6 (1940), v.28-30 (1944-45), v.32 (1946), v.36 (1948), v.39 (1949), v.41-47 (1950-52), v.102 (1972),

- v.103:12 (1973), v.104-6 (1974-76), v.113-15 (1983-85), v.117:2-12 (1987), v.118:10-12 (1988)]
- Journal of nutrition education (0022-3182)**
Franklin, Oakland, Society for Nutrition Education. Vol. 1- 1969- Freq: Q [s 194]
CN: AGRCHEM
Note: Indexed by Current contents
AU: v. 12 (1980)- [missing: v.17:6 (1985), v.19:4-6 (1987)]
- Journal of pure and applied sciences**
Bahawalpur, Pakistan, Chemistry Department, Islamia University. Vol. 1- 1982- Freq: Semi-a [s 225]
CN: GENSCI
AU: v. 7 (1988)-
- Journal of range management**
Denver, Colorado, Society for Range Management. Vol. 1- 1949- Freq: Bi-mo [s 227]
CN: AGRON
AU: v. 42 (1989)-
- The journal of soil science (0022-4588)**
Oxford, Clarendon Press. Vol. 1- Mar. 1949- Freq: Q [s 132]
CN: SOILSCI
Note: Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258 Annual, 1949-50; semiannual, 1951- ; 4 no. a year
AU: v. 17 (1961)- [missing: v.19-31 (1964-80), v.33 (1982), v.35:4 (1984)]
- Journal of the American Society for Horticultural Science (0003-1062)**
Alexandria, Virginia, American Society for Horticultural Science. Vol. 94- Jan. 1969- Freq: Bi-mo [s 2]
CN: HORT
PT: Proceedings of the American Society for Horticultural Science
Note: Indexed selectively by Biological abstracts.
AU: v. 103 (1978)- [missing: v.104:2-6 (1979), v.105 (1980), v.107 (1982), v.110 (1985), v.111:4-6 (1986)]
- Journal of the Chemical Society of Pakistan**
Karachi, Chemical Society of Pakistan. Vol. 1- Sept. 1979- Freq: Q [s 118]
CN: AGRCHEM
Note: Indexed selectively by: Chemical abstracts 0009-2258
AU: v. 10 (1988)- [missing: v.10:2-3 (1988)]
- Journal of the Indian Potato Association (0085-0425)**
Shimla, Indian Potato Association. Vol. 1- 1974- Freq: Q [s 210]
CN: HORT
AU: v. 14 (1988)-
- Journal of the Pakistan Historical Society (0030-9796)**
Karachi, Pakistan Historical Society. Vol. 1- Jan. 1953- Freq: Q [s 130]
CN: MISC
AU: v. 36 (1988)- [missing: v.36:2 (1988)]
- Journal of the science of food and agriculture (0022-5142)**
London, Blackwell Scientific. Vol. 1- Jan. 1950- Freq: M [s 17]
CN: FOODTECH
Note: Indexed selectively by Biological abstracts.
AU: v. 25 (1974)- [missing: v.25:6,12 (1974), v.26-27 (1975-76), v.28:1-9 (1977), v.30-31 (1979-80), v.36 (1985), v.37:12 (1986)]
- Journal of virology (0022-538x)**
Baltimore, Maryland, American Society of Microbiology. Vol. 1- Feb. 1967 Freq: M [s 50]
CN: PLANTPATH
AU: v. 59 (1986)- [missing:v.60:1 (1986); v.62:7 (1988)]
- MAAS journal of Islamic sciences (0970-1672)**
Aligarh, Muslim Association for the Advancement of Science. Vol. 1- 1985- Freq: Semi-a [s 228]
CN: ISLAM
AU: v. 5 (1989)-
- Mehran University research journal of engineering and technology**
Jamshoro, Sind, Mehran University of Engineering and Technology. Vol. 1- 1982- Freq: Q [s 135]
CN: GENSCI
Note: Indexed selectively by: Computer & control abstracts 0036-8113 Indexed selectively by: Electrical & electronics abstracts 0036-8105 Indexed selectively by: Physics abstracts. Science abstracts. Series a 0036-8091
AU: v. 5 (1986)-
- Methods in enzymology (0076-6879)**
New York, Academic Press. Vol. 1- 1955- Freq: Irreg [s 152]
CN: 612.015 MET
Note: Editor: <v. , 1962> Sidney P. Colowick; <v. , 1984>- Finn Wold. Indexes: Subject index, v.1-6 issued as v.7; v.1-30 issued as v.33; v.31-32, 34-60 issued as v.75; v.61-74,

- 76-80 issued as v.95; v.81-94, 96-101 issued as v.120; v.102-119, 121-134 issued as v.140.
AU: v. 5 (1962), v. 106-108 (1984)
- Methods in microbiology (0580-9517)**
New York, Academic Press. Vol. 1- 1969-
Freq: Irreg [s 159]
CN: 576 MET
Note: Editor: J. R. Norris <1969->
AU: v. 2-3 (1970), v. 5A-B (1970), v. 6B (1972),
v. 9 (1976), v. 11-13 (1978-1979), v. 15-18
(1984-1985)
- Methods in virology (0076-6933)**
New York, Academic Press. Vol. 1- 1967-
Freq: Irreg [s 167]
CN: 576.6 MET
Note: Editors: 1967- K. Maramorosch and H.
Koprowski.
AU: v. 1-8 (1967-1984)
- Methods of biochemical analysis (0076-6941)**
New York, Interscience. Vol. 1- 1954- Freq:
Irreg [s 181]
CN: 544.94 GLI
Note: Editor: v. 1- D. Glick Indexed by:
Biological abstracts 0006-3169 Indexed
selectively by: Chemical abstracts 0009-2258
Indexes: Vols. 1-3, 1954-1956, in v. 3; Vols.
1-6, 1954-1958, in v. 6.
AU: v. 11 (1963)
- National gardening (0887-8447)**
Burlington, Vermont, National Gardening
Association. Vol. 1- 1978- Freq: M [s
212]
CN: HORT
AU: v. 8 (1985)- [missing: v.8:1-9 (1985),
v.9:1,4,6 (1986), v.10:2-5,7-12 (1987), v.11:5,9
(1988)]
- Nutrition abstracts and reviews. Series B:
Livestock feeds and feedings (0309-135x)**
Farnham Royal, Slough, England,
Commonwealth Agricultural Bureaux. Vol.
47- Jan. 1977- Freq: M [s 18]
CN: ANIMSCI
AU: v. 46 (1976)- [missing: v.46:12 (1976),
v.47:1 (1977), v.57:6 (1987)]
- Operations research (0030-364X)**
Baltimore, Maryland, Operations Research
Society of America. Vol. 4- Feb. 1956-
Freq: Bi-mo [s 51]
CN: MATHSTAT
PT: Journal of the Operation Research Society
of America
Note: Vols. 1-15, 1952-67. 1 vol. (includes index
to journal under its earlier title).
AU: v. 34 (1986)- [missing: v.34:2,4-6 (1986),
v.35:3-6 (1987), v.36 (1988)]
- Organic analysis**
New York, Interscience. Vol. 1-4, 1953-June
1960 Freq: A [s 165]
CN: 547 MIT
Note: Editor: 1953- J. Mitchell, Jr. and others.
AU: v. 1-3 (1953-1956)
- Ornamental horticulture (0305-4934)**
Farnham Royal, Slough, England,
Commonwealth Bureau of Horticulture and
Plantation Crops. Vol. 1- 1975- Freq: M
[s 52]
CN: HORT
AU: v. 8 (1982)- [missing: v.13:10 (1987)]
- Pakistan agriculture**
Karachi, Economist Publications. Vol. 1- 1979-
Freq: M [s 230]
CN: GENAGR
AU: v. 10 (1988)- [missing: v.10:12 (1988),
v.11:3-4,8,12 (1989)]
- Pakistan and Gulf economist (0253-1941)**
Karachi, Economist Publications. Vol. 1- 1962-
Freq: W [s 199]
CN: AGRECON
AU: v. 7 (1988)-
- Pakistan development review (0030-9729)**
Islamabad, Pakistan Institute of Development
Economics. Freq: Q [s 200]
CN: AGRECON
AU: v. 26 (1987)- [missing: v.26:3 (1987)]
- Pakistan journal of agricultural research
(0251-0480)**
Islamabad, Pakistan Agricultural Research
Council. Vol. 1, no. 1- Jan./Mar. 1980-
Freq: Q [s 120]
CN: GENAGR
PT: Agriculture Pakistan, 0002-1776
Note: Indexed selectively by: Chemical abstracts
0009-2258
AU: v. 1 (1980)- [missing: v.1: 3-4 (1980),
v.2:1-3 (1981), v.3:1-3 (1982), v.4:4 (1983),
v.5:2-4 (1984), v.6:1 (1985), v.7:2 (1986)]
- Pakistan journal of agricultural social sciences**
Islamabad, Pakistan Agricultural Research
Council. Freq: Bi-a [s 226]
CN: AGRECON
AU: v. 2 (1987)-
- Pakistan journal of applied economics (0254-9204)**
Karachi, Applied Economics Research Centre.
Vol. 1- 1982- Freq: Semi-a [s 231]
CN: AGRECON
AU: v. 5 (1986)
- Pakistan journal of biochemistry (0300-8185)**
Lahore, Pakistan Society of Biochemists. Vol. 1-

- Apr./Oct. 1968- Freq: Semi-a [s 119]
CN: AGRCHEM
AU: v. 19 (1986)-
- Pakistan journal of botany**
Karachi, Pakistan Botanical Society. Vol. 1-
1969- Freq: Semi-a [s 232]
CN: PBG
AU: v. 10 (1987)- [missing: v.19:1 (1987),
v.20:1 (1988)]
- Pakistan journal of distance education**
Islamabad, Allama Iqbal Open University.
Freq: Semi-a [s 233]
CN: AGRECON
AU: v. 4 (1987)- [missing: v.5:2 (1988)]
- Pakistan journal of forestry**
Peshawar, Pakistan Forest Institute. Vol. 1-
1951- Freq: Q [s 234]
CN: HORT
AU: v. 38 (1988)-
- Pakistan journal of nematology**
Karachi, Pakistan Society of Nematologists. Vol.
1, no. 1- Jan. 1983- Freq: Semi-a [s 121]
CN: PLANTPROT
Note: Official publication of Pakistan Society of
Nematologists.
AU: v. 1 (1983)- [missing: v.1:1 (1983), v.6:2
(1988)]
- Pakistan journal of scientific and industrial
research (0030-9885)**
Karachi, Pakistan Council of Scientific and
Industrial Research. Vol. 1- Jan. 1958-
Freq: Bi-mo [s 122]
CN: GENSCI
Note: Vol. 12, no. 3 was dated Apr. 1970 and is
in continuation of v. 12, no. 1/2 of Jan./Apr.
1969. Indexed by: Bibliography of agriculture
0006-1530 Quarterly, 1958-69; bimonthly,
Apr. 1970-
AU: v. 18 (1975)- [missing: v.24-25
(1981-1982)]
- Pakistan science abstracts**
Islamabad, Pakistan Scientific and Technological
Information Centre. Vol. 1- 1961- Freq:
Q [s 235]
CN: GENSCI
AU: v. 27 (1987)- [missing: v.27:1-2 (1987),
v.28:3-4 (1988)]
- Pakistan veterinary journal**
Faisalabad, Pakistan, University of Agriculture,
Faculty of Veterinary Science. Vol. 1-
1981- Freq: Q [s 201]
CN: ANIMSCI
Note: Indexed by: Biological abstracts Indexed
by: Chemical abstracts
- AU: v. 7 (1987)- [missing: v.7:4 (1987), v.8:1
(1988)]
- The Peshawar journal of development studies**
Peshawar, Institute of Economic Studies. Vol. 1,
1978 Freq: A [s 74]
CN: AGRECON
ST: Journal of development studies
AU: v. 1 (1978)
- Pesticide science (0031-613X)**
Oxford, Blackwell Scientific. Vol. 1- 1970-
Freq: A [s 183]
CN: PLANTPROT
Note: Published for the Society of Chemical
Industry. Indexed selectively by: Biological
abstracts 0006-3169 Indexed selectively by:
Chemical abstracts 0009-2258
AU: v. 25 (1989)-
- Phytopathology (0031-949x)**
St. Paul, Minnesota, American Phytopathological
Society. Vol. 1- Feb. 1911- Freq: M [s
19]
CN: PLANTPATH
Note: Indexed selectively by Biological abstracts.
AU: v. 36 (1946)- [missing: v.36:1-4,6-10,12
(1946), v.37-41: (1947-50), v.41:2-12 (1951),
v.42-47 (1953-57), v.48-51:3-4
(1958-61), v.75 (1985), v.76:4,7 (1986),
v.77:4,6 (1987)]
- Plant and soil (0032-079x)**
The Hague, Netherlands, M. Nijhoff. Vol. 1-
1948- Freq: 18 no. a year [s 20]
CN: SOILSCI
Note: Irregular 1948- Bimonthly 1974- Monthly
1979-1980
AU: v. 58 (1981)- [missing: v.64-69 (1982),
v.83-92 (1985), v.93:1-2 (1986), v.104:1 (1987),
v.108:2 & v.109:1 (1988)]
- Plant breeding abstracts (0032-0803)**
Cambridge, England, Commonwealth Bureau of
Plant Breeding and Genetics. Vol. 1-
Jan./June 1930- Freq: M [s 53]
CN: PBG
AU: v. 45 (1975)- [missing: v.57:6,8,10 (1987)]
- Plant breeding reviews (0730-2207)**
Westport, Connecticut, AVI. Vol. 1- 1983-
Freq: A [s 169]
CN: 631.53 PLA
Note: Editor: Jules Janick. Sponsored by the
American Society for Horticultural Science et
al.
AU: v. 1 (1983)
- Plant cell (1040-4651)**
Rockville, Maryland, American Society of Plant
Physiologists. Vol. 1- 1989- Freq: M [s

- 237]
 CN: PBG
 AU: v. 1 (1989)-
- Plant diseases: an international journal of applied plant pathology (0191-2917)**
 St. Paul, Minnesota, American Phytopathological Society. Vol. 64- 1980- Freq: M [s 54]
 CN: PLANTPATH
 PT: Plant disease reporter
 Note: Section called "Phytopathological News" resumed independent publication in Sept. 1981.
 AU: v. 51 (1967)- [missing: v.51:1-3 (1967), v.52:9 (1968), v.57 (1973), vs.59-66 (1975-82), vs.68-69 (1984-85), v.70:7,9,11,12 (1986), v.71:1,4,5,12 (1987)]
- Plant foods for human nutrition (0377-3205)**
 Dordrecht, Netherlands, Kluwer. Vol. 1- 1952- Freq: Q [s 202]
 CN: AGRCHEM
 Note: Indexed by: Biological abstracts Indexed by: Nutrition abstracts
 AU: v. 38 (1988)-
- Plant molecular and cell biology**
 Oxford, Clarendon Press. Vol. 1, 1984 [s 158]
 CN: 581.8 MIF
 ST: Oxford surveys of plant molecular and cell biology, 0264-861X
 Note: Editor: G. J. Miflin Indexed selectively by: Chemical abstracts 0009-2258
 AU: v. 1 (1984)
- Plant pathology (0032-0862)**
 Oxford, Blackwell Scientific. Vol. 1- Mar. 1952- Freq: Q [s 137]
 CN: PLANTPATH
 Note: A record of current work on plant diseases and pests in the British Isles. Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258
 AU: v. 30 (1981)
- Plant physiology (0032-0889)**
 Rockville, Maryland, American Society of Plant Physiologists. Vol. 1- Jan. 1926- Freq: M [s 21]
 CN: PBG
 Note: Published quarterly from 1926-1953. Published bimonthly 1954- .
 AU: v. 25 (1950)- [missing: v.31-39 (1956-64), v.41:11-12 (1966), v.53-68 (1974-81), v.77-79 (1985), v.80:4 (1986), v.81:4 (1986), v.84:3 (1987), v.85:3 (1987)]
- Potato abstracts (0308-7344)**
 Farnham Royal, Slough, England,
- Commonwealth Agricultural Bureaux. Vol. 1- 1976- Freq: M [s 203]
 CN: AGRON
 AU: v. 10 (1985)-
- Poultry abstracts (0306-1582)**
 Farnham Royal, Slough, England, Commonwealth Agricultural Bureaux. Vol. 1- 1975- Freq: M [s 204]
 CN: ANIMSCI
 AU: v. 8 (1982)- [missing: v.10:11-12 (1984), v.14:1-9 (1988)]
- Poultry science (0032-5791)**
 Champaign, Illinois, Poultry Science Association. Vol. 1- Oct. 1921- Freq: M [s 138]
 CN: ANIMSCI
 Note: Official organ of the American Association of Instructors and Investigators in Poultry Husbandry, 1921-26; of the Poultry Science Association, 1927- Indexed by: Bibliography of agriculture 0006-1530 Indexed by: Biological abstracts 0006-3169 Indexed by: Chemical abstracts 0009-2258 Subject index: Vols. 1-20, 1921-Nov. 1941. 1 v.; Vols. 21-30, 1942-51.
 AU: v. 60 (1981)- [missing: v.66:2,4-12 (1987), v.67:1-9 (1988)]
- Practical biotechnology (0262-7884)**
 Harpenden, England, Hardman. Vol. 1- 1981- Freq: Bi-mo [s 213]
 CN: PBG
 AU: v. 5 (1984)- [missing: v.8-10 (1987-89)]
- Prepared foods (0747-2536)**
 Chicago, Gorman Pub. Co. Vol. 153, no. 3- Mar. 1984- Freq: M [s 139]
 CN: FOODTECH
 PT: Processed prepared foods
 AU: v. 152 (1983)- [missing: v.152:7-8,10 (1983), v.153:8 (1984), v.157:1-10 (1988)]
- Proceedings of Helminthological Society of Washington**
 Lawrence, Kansas, Helminthological Society of Washington. Freq: Semi-a [s 238]
 CN: ENTOMOL
 AU: v. 56 (1989)-
- Proceedings of the Pakistan Academy of Sciences**
 Islamabad, Pakistan Academy of Sciences. Vol. 1- 1964- Freq: Q [s 205]
 CN: GENSCI
 AU: v. 1 (1964)-
- Progress in nucleic acid research (0091-4886)**
 New York, Academic Press. Vol. 1-2, 1963 Freq: Irreg [s 184]
 CN: 574.8732 DAV
 ST: Progress in nucleic acid research and

- molecular biology, 0079-6603
 Note: Editors: 1963, J.N. Davidson and W. E. Cohn. Indexed selectively by: Chemical abstracts 009-2258
 AU: v. 1-2 (1963)
- Progress in pesticide biochemistry and toxicology**
 Chichester, England, John Wiley. Vol. 1-1981- Freq: Irreg [s 156]
 CN: 632.95 HUT
 Note: Edited by D. H. Hutson and T. R. Roberts
 AU: v. 1-4 (1981-1985)
- Progressive farming**
 Islamabad, Pakistan Agricultural Research Council. Vol. 1- 1981- Freq: Bi-mo [s 197]
 CN: GENAGR
 Note: Indexed by: Biological abstracts Indexed by: Nutrition abstracts
 AU: v. 7 (1987)- [missing: v.7:4-5 (1987), v.8:1,3 (1988)]
- Recent advances in animal nutrition**
 London, Butterworths. 1977- Freq: A [s 170]
 CN: 636.085 HAR
 Note: Volumes for 1977- issued as "11th- in the series of Nutrition Conferences for Feed Manufacturers." Editor: <1981-> William Haresign. Indexed selectively by: Chemical abstracts 0009-2258
 AU: 1981-1985
- Residue reviews (0080-181X)**
 New York, Springer-Verlag. Vol. 1-97, 1962-1986 Freq: Irreg [s 166]
 CN: 632.95 GUN
 ST: Reviews of environmental contamination and toxicology, 0179-5953
 Note: Editor: v. <66-> Francis A. Gunther. Vols. 1-16 have title also in German: Ruckstands-Berichte. Indexed by: Bibliography of agriculture 0006-1530
 Indexed by: Biological abstracts 0006-3169
 Indexes: Every 10th vol. includes cumulative title, subject, and author indexes for last 10 volumes.
 AU: v. 65-66 (1976-1977), v. 73 (1980), v. 82 (1982), v. 84-86 (1982-1983)
- Review of applied entomology. Series A: Agricultural (0305-0076)**
 Farnham Royal, Slough, England, Commonwealth Agricultural Bureaux. Vol. 1- Jan. 1913- Freq: M [s 56a]
 CN: ENTOMOL
 Note: Vols. for 1913-June 1930 issued by the Imperial Bureau of Entomology; July 1930-Dec. 1947 by the Imperial Institute of Entomology; Jan 1948- by the Commonwealth Institute of Entomology.
 AU: v. 63 (1975)- [missing: v.75:3 (1987)]
- Review of applied entomology. Series B: Medical and veterinary (0305-0084)**
 Farnham Royal, Slough, England, Commonwealth Agricultural Bureaux. Vol. 1- Jan. 1913- Freq: M [s 56b]
 CN: ENTOMOL
 Note: Vols. for 1913-June 1930 issued by the Imperial Bureau of Entomology; July 1930-Dec. 1947 by the Imperial Institute of Entomology; Jan. 1948- by the Commonwealth Institute of Entomology.
 AU: v. 63 (1975)- [missing: v.75:3 (1987)]
- Review of economics and statistics (0034-6535)**
 Cambridge, Massachusetts, Harvard University Press. Vol. 30- Feb. 1948- Freq: Q [s 57]
 CN: AGRECON
 PT: Review of economic statistics
 AU: v. 68 (1986)
- Review of plant pathology (0034-6438)**
 Kew, England, Commonwealth Mycological Institute. Vol. 1- 1970- Freq: M [s 22]
 CN: PLANTPATH
 PT: Review of applied mycology
 AU: v. 54 (1975)- [missing: v.66:3 (1987), v.67:2 (1988)]
- Reviews of weed science**
 Champaign, Illinois, Weed Science Society of America. Vol. 1- 1985- Freq: A [s 75]
 CN: 632.58 REV
 AU: v. 1-3 (1985-1987)
- Rice abstracts (0141-0164)**
 Farnham Royal, Slough, England, Commonwealth Agricultural Bureaux. Vol. 1- 1978- [s 140]
 CN: AGRON
 Note: Published by Commonwealth Agricultural Bureaux in collaboration with International Food Information Service.
 AU: v. 1 (1978)- [missing: v.5-8 (1982-1985), v.9:5 (1986)]
- Rural extension, education and training abstracts (0140-4776)**
 Oxford, Commonwealth Bureau of Agricultural Economics. Vol. 1- Mar. 1978- Freq: Q [s 23]
 CN: AGRECON
 AU: v. 5 (1982)- [missing: v.10:2-4 (1987), v.11:4 (1988)]
- Rural sociology (0036-0112)**
 Baton Rouge, Louisiana, Rural Sociology Section, American Sociological Society. Vol. 1, no. 1- Mar. 1936- Freq: Q [s 24]

- CN: AGRECON**
 Note: Vols. 1-2, 1936-37, published by the Rural Sociology Section, American Sociological Society, vol. 3- by the Rural Sociological Society. Indexes vols. 1-20 (1936-1955) in vol. 22, vols. 21-30 in vol. 30 and vols. 31-40 (1966-75) in vol. 40.
 AU: v. 47 (1982)- [missing: v.50 (1985), v.51:4 (1986)]
- Sarhad journal of agriculture**
 Peshawar, N.W.F.P. Agricultural University. Vol. 1, no. 1- July 1985- Freq: Q [s 63]
 CN: GENAGR
 AU: v. 1 (1985)-
- Science (0036-8075)**
 Washington, DC, American Association for the Advancement of Science. Vol. 1-23, Feb. 9 1883-Mar. 23, 1894; new ser., vol. 1- Jan. 4, 1895- Freq: W (except last week in Dec.) [s 146]
 CN: GENSCI
 Note: Indexes in middle of last issue of a volume. Vols. for 1911-13 contain the Proceedings of the Helminthological Society of Washington, ISSN 0018-0120, 1st-15th meetings. Since Jan. 1901 the official proceedings and most of the papers of the American Association for the Advancement of Science have been included in Science. Indexed selectively by: Bibliography of agriculture 0006-1530 Indexed selectively by: Biological abstracts 0006-3169 Indexed selectively by: Chemical abstracts 0009-2258
 AU: v. 240 (1988)- [missing: v.240:4853-4864, v.241:4869, 4874-4878, v.242:4886 (1988)]
- Science, technology and development**
 Islamabad, National Science Council of Pakistan. Vol. 1- Jan. 1982- Freq: Bi-mo [s 211]
 CN: GENSCI
 AU: v. 1 (1982)-
- Scientific Khyber**
 Peshawar, Islamia College, University of Peshawar. Vol. 1- 1988- Freq: Semi-a [s 243]
 CN: GENSCI
 AU: v. 2 (1989)-
- Seed abstracts (0141-0180)**
 Farnham Royal, Slough, England, Commonwealth Agricultural Bureaux. Vol. 1- 1978- Freq: M [s 141]
 CN: AGRON
 Note: Published in collaboration with International Food Information Service.
 AU: v. 1 (1978)
- SIAM journal of applied mathematics (0368-4245)**
 Philadelphia, Pennsylvania, Society for Industrial and Applied Mathematics. vol. 14, no. 1- Jan. 1966- Freq: Bi-mo [s 25]
 CN: MATHSTAT
 PT: Journal of the Society for Industrial and Applied Mathematics
 AU: v. 46 (1986)- [missing: v.46:3 (1986), v.47:3 (1987)]
- Sind journal of agricultural research**
 Tandojam, Agriculture Research Institute. Freq: Bi-a [s 244]
 CN: GENAGR
 AU: v. 6 (1986-87)-
- Sind University arts research journal**
 Jamshoro, Sind, Faculty of Arts, University of Sind. Vol. 1- 1976- Freq: A [s 245]
 CN: MISC
 AU: v. 23 (1988)-
- Sind University research journal**
 Jamshoro, Sind, Faculty of Science, University of Sind. Vol. 1- 1969- Freq: Semi-a [s 246]
 CN: GENSCI
 AU: v. 19 (1987)-
- Small ruminant research (0921-4488)**
 Amsterdam, Elsevier. Vol. 1- 1988- Freq: Q [s 247]
 CN: ANIMSCI
 AU: v. 2 (1989)-
- Sociology ruralis (0038-0199)**
 Assen, Netherlands, Van Gorcum. Vol. 1- Spring 1960- Freq: Q [s 32]
 CN: AGRECON
 Note: Indexed selectively by Sociological abstracts.
 AU: v. 26 (1986)- [missing: v.26:1 (1986)]
- Soil and fertilizers (0038-2970)**
 Farnham Royal, Slough, England, Commonwealth Agricultural Bureaux. Vol. 1- 1938- Freq: M [s 58]
 CN: SOILSCI
 Note: Vols. for 1938-47 prepared by the Imperial Bureau of Soil Science; 1948- by the Commonwealth Bureau of Soil Science; 1976- by the Commonwealth Bureau of Soils.
 AU: v. 38 (1975)- [missing: v.48 (1985), v.49:8,12 (1986), v.50:4,6-7 (1987), v.51:9 (1988)]
- Soil science (0038-075x)**
 Baltimore, Maryland, Williams and Wilkins. Vol. 1- Jan. 1916- Freq: M [s 28]
 CN: SOILSCI
 Note: Indexed selectively Biological abstracts.
 AU: v. 91 (1961)- [missing: v.91:1-2,7-12,

- yv.92:1-6,8,12 (1961), v.93:6-12, v.94:1-7
 (1962), v.95:2,7-12, v.96:1-6,12 (1963),
 v.97:7-12, v.98:1-6 (1964), v.99:1,3-12 (1965),
 vs.100-134 (1965-82), v.135-138:7-12
 (1983-84), v.139-140 (1985), v.141:1-3,7-12,
 v.142:5-12 (1986), v.143:2-4,7-12, v.144:2,7-12
 (1987), v.145:6 (1988)]
- Soil science and plant nutrition (0038-0768)**
 Tokyo, Japanese Society of Soil Science and
 Plant Nutrition. Vol. 1- 1955- Freq: Q [s
 206]
 CN: SOILSCI
 Note: Indexed by: Biological abstracts Indexed
 by: Current contents
 AU: v. 31 (1985)- [missing: v.31:4 (1985)]
- Soil Science Society of America journal (0361-5995)**
 Madison, Wisconsin, Soil Science Society of
 America. Vol. 40- Jan. 1976- Freq: Bi-mo
 [s 27]
 CN: SOILSCI
 PT: Proceedings (Soil Science Society of
 America)
 Note: Indexed selectively by Biological abstracts.
 AU: v. 45 (1981)- [missing: v.47 (1983),
 v.49-50 (1985-86)]
- Sorghum and millets abstracts (0308-2970)**
 Farnham Royal, Slough, England,
 Commonwealth Agricultural Bureaux. Vol. 1,
 no. 1- Jan. 1976- Freq: M [s 59]
 CN: AGRON
 Note: Has subject index in English, French and
 Spanish.
 AU: v. 1 (1976)- [missing: v.10 (1985),
 v.11:6,12 (1986)]
- Soyabean abstracts (0141-0172)**
 Farnham Royal, Slough, England,
 Commonwealth Agricultural Bureaux. Vol. 1-
 Jan. 1978- Freq: Chek [s 142]
 CN: AGRON
 Note: Published in collaboration with
 International Food Information Service.
 Editor: R. J. Lewington.
 AU: v. 11 (1988)-
- Technology information (PASTIC)**
 Islamabad, Pastic National Centre
 Quaid-e-Azam University. Freq: M [s 250]
 CN: GENSCI
 AU: 1988
- TESOL: Teachers of English to speaker of other
 languages (0039-8322)**
 Alexandria, Virginia, Teachers of English to
 Speaker of Other Languages, Inc. Vol. 1-
 1967- Freq: Q [s 249]
 CN: MISC
 AU: v. 23 (1989)-
- Topics in enzyme and fermentation biotechnology
 (0140-0835)**
 New York, Wiley. Vol. 1-10, 1977-1985 Freq:
 Irreg [s 186]
 CN: 661.8 WIS
 Note: Editor: 1977- A. Wiseman
 AU: v. 4 (1980)
- Training for agriculture and rural development**
 Rome, FAO. 1975- Freq: A [s 26]
 CN: 630.7 FOO
 Note: Began in 1975.
 AU: 1979
- Transactions of the ASAE (0001-2351)**
 St. Joseph, Michigan, American Society of
 Agricultural Engineers. Vol. 1- 1958-
 Freq: Bi-mo [s 38]
 CN: AGRMECH
 PT: Transactions of the American Society of
 Agricultural Engineers
 Note: Indexed by Biological abstracts.
 AU: v. 31 (1988)- [missing: v.31:1-2 (1988)]
- Tropical animal production (0250-5576)**
 Santo Domingo, Dominican Republic, Consejo
 Estatal del Azúcar, Division de Ganadería y
 Boyada. Vol. 1- 1976- Freq: 3 no. a year
 [s 29]
 CN: ANIMSCI
 Note: Issued also Spanish under title:
 Produccion animal tropical.
 AU: 1990-
- Tropical oil seeds abstracts (0308-2962)**
 Farnham Royal, Slough, England,
 Commonwealth Agricultural Bureaux. Vol. 1-
 Jan. 1976- Freq: M [s 30]
 CN: AGRON
 AU: v. 2 (1977)- [missing: v.10 (1985), v.11:6,8
 (1986)]
- Tropical science (0041-3291)**
 London, Tropical Products Institute. Vol. 1-
 1959- Freq: Q [s 208]
 CN: GENSCI
 Note: Indexed by: Biological abstracts Indexed
 by: Nutrition abstracts
 AU: v. 28 (1988)
- Vitamins and hormones: advances in research and
 applications (0083-6729)**
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The British journal of nutrition
Cereal chemistry
European journal of clinical nutrition
Human nutrition. Applied nutrition
Human nutrition. Clinical nutrition
Human nutrition. Food sciences and nutrition
Journal of agricultural and food chemistry
Journal of American Dietetic Association
Journal of chemical ecology
Journal of human nutrition and dietetics
The journal of nutrition
Journal of nutrition education
Journal of the Chemical Society of Pakistan
Pakistan journal of biochemistry
Plant foods for human nutrition

AGRECON

Abstracts of working papers in economics
Agricultural economics
American journal of agricultural economics
The American journal of economics and sociology
Applied geography and development
Development
Extension review
Journal of co-operative extension
Journal of development studies
Journal of economics education
Journal of extension
The journal of financial research
Pakistan and Gulf economist
Pakistan development review
Pakistan journal of agricultural social sciences
Pakistan journal of applied economics
Pakistan journal of distance education
The Peshawar journal of development studies
Review of economics and statistics
Rural extension, education and training abstracts
Rural sociology
Sociology ruralis
Western journal of agricultural economics
World agricultural economics and rural sociology abstracts

AGRMECH

Agricultural engineering
Agriculture engineering abstracts
AMA: Agricultural mechanization in Asia
AMA: Agricultural mechanization in Asia, Africa and Latin America
Journal of agricultural engineering
Journal of agricultural engineering research
Journal of engineering and applied sciences
Transactions of the ASAE

AGRON

Agronomy journal
American potato journal
Canadian journal of plant science
Crop science
Field crop abstracts
Field crop research
International rice research newsletter
Journal of range management
Potato abstracts
Rice abstracts
Seed abstracts
Sorghum and millets abstracts
Soyabean abstracts
Tropical oil seeds abstracts

ANIMSCI

Animal feed science and technology
Animal research and development
Dairy goat journal
International goat and sheep research
Journal of animal science
The journal of dairy research
Journal of dairy science
Nutrition abstracts and reviews. Series B:
Livestock feeds and feedings
Pakistan veterinary journal
Poultry abstracts
Poultry science
Small ruminant research
Tropical animal production

ENTOMOL

Annals of the Entomological Society of America
Antenna
Bulletin of the Entomological Society of America
The Canadian entomologist
Entomologia experimentalis et applicata
Entomophaga
Environmental entomology
Journal of economic entomology
Proceedings of Helminthological Society of Washington
Review of applied entomology. Series A:
Agricultural
Review of applied entomology. Series B:
Medical and veterinary

FOODTECH

Canadian Institute of Food Science and Technology journal
Ecology of food and nutrition
Food chemistry
Food processing
Food science and technology abstracts
Food technology
Frozen foods

- Journal of food science
Journal of the science of food and agriculture
Prepared foods
- GENAGR**
Agricultural information development bulletin
Agricultural research
Australian journal of agricultural research
Farm journal
Frontier journal of agricultural research
Indian farming
Indian journal of agricultural research
JARQ
The journal of agricultural science
Pakistan agriculture
Pakistan journal of agricultural research
Progressive farming
Sarhad journal of agriculture
Sind journal of agricultural research
- GENSCI**
American scientist
Biological abstracts
Bioscience
FASEB journal
Hamdard medicus
Journal of pure and applied sciences
Mehran University research journal of
engineering and technology
Pakistan journal of scientific and industrial
research
Pakistan science abstracts
Proceedings of the Pakistan Academy of
Sciences
Science
Science, technology and development
Scientific Khyber
Sind University research journal
Technology information (PASTIC)
Tropical science
- HORT**
Horticultural abstracts
HortScience
The journal of horticultural science
Journal of the American Society for
Horticultural Science
Journal of the Indian Potato Association
National gardening
Ornamental horticulture
Pakistan journal of forestry
- ISLAM**
Al-balagh
Al-bayynat
Al-haq
Al-tauheed
Hamdard islamicus
MAAS journal of Islamic sciences
- MATHSTAT**
Byte
Econometrica
JASA: Journal of the American Statistical
Association
Operations research
SIAM journal of applied mathematics
- MISC**
AID research and development abstracts
AUSSEN Politik: German foreign affairs review
Journal of the Pakistan Historical Society
Sind University arts research journal
TESOL: Teachers of English to speaker of other
languages
- PBG**
Canadian journal of genetics and cytology
Canadian journal of plant science and cytology
Chromosoma
Genetics
Genome
Heredity: an international journal of genetics
The Indian journal of genetics and plant
breeding
The journal of heredity
Pakistan journal of botany
Plant breeding abstracts
Plant cell
Plant physiology
Practical biotechnology
- PLANTPATH**
Journal of nematology
Journal of virology
Phytopathology
Plant diseases: an international journal of
applied plant pathology
Plant pathology
Review of plant pathology
- PLANTPROT**
Crop protection
Pakistan journal of nematology
Pesticide science
Weed research
Weed science
Weed technology
- SOILSCI**
Communications in soil science and plant
analysis
The journal of soil science
Plant and soil
Soil and fertilizers
Soil science
Soil science and plant nutrition
Soil Science Society of America journal