Universidad Autónoma Agraria Antonio Narro

Self-Evaluation Report

Natural Resources, Rangeland Management and Conservation

Undergraduate Major Degree Program (Carrer)

Ingeniero Agrónomo Zootecnista Program

To be evaluated by:
SRM Special Commitee

Rangeland Ecology and Management

SRM Society for Range Management

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TABLE OF CONTENTS

Index of tables

Index of figures

EXECUTIVE SUMMARY

This document represents a team effort to carry out a self-evaluation report of the Ingeniero Agrónomo Zootecnista (IAZ for its acronym in Spanish) study Program in its Natural Resources and Rangeland Management and Conservation Profile (MCRNYP for its acronym in Spanish) offered by Universidad Autónoma Agraria Antonio Narro (UAAAN for its acronym in Spanish). The self-evaluation exercise was carried out following the seven standards established by the Society for Range Management (SRM). It should be noted that performing an auto diagnosis of the Program allowed to identify interesting aspects on the strengths and weaknesses of the referred program. It is pertinent to comment that to prevent the document from being very extensive, links are indicated to allow the reader to address additional documents or websites.

A brief history of the IAZ Program is provided at the beginning of this document, which describes its inception in 1971 and its evolution throughout almost 47 years where modifications have been carried out in accordance with the conditions and requirements of a changing society. All this led to achieve the national accreditation for the next five years (2018-2022) by the Mexican Committee of Accreditation of the Agronomic Education, A.C. (COMEAA for its acronym in Spanish).

Included within this document are the Mission, Vision and Objectives, the academic structure, the relationship with other academic entities as well as the recent changes made to the degree plan. Additionally, the Academic Improvement Plan of the graduate profile for the medium term (five to ten years) is presented. For graduation purposes, the various forms and procedures required are described.

Within the Curriculum and tutorial section, the credit standards of the SRM are presented together with those of the MCRNyP graduate profile, and a brief description of the courses, as well as general and specific concepts. It is important to remark that the level of compliance of the UAAAN Program is satisfactory. In the subject of tutorials / consultancies, an illustrated panorama of the electronic system is shown, under which tutorials and advising to students is carried out.

In the Program Faculty section curriculum vitae and a brief description of their academic productivity, research, and development (extension) activities are included. Additionally, administrative policies are described which contribute to the growth and development of faculty and staff, and a brief description is provided regarding aspects of employment, substitution, and vacancies.

Regarding the section on research and extension to support teaching, institutional policies and operational strategies are mentioned and a table indicating the research projects carried out is included in the document and the participation of teachers and students in extension work with producers through development projects is mentioned.

The professional extracurricular development section involves several topics, which are briefly described as follows:

Integration of different student groups has been achieved for a long time, for example, the International Range Plants Identification Team (EIIPP for its acronym in Spanish) stands out for its participations and important achievements obtained during the international contests for more than 30 years. It is important to mention that the UAAAN has obtained first place, per teams, on 27 occasions. In 2016, a group of students interested in training and learning how to operate a cattle ranch created a student group called "Grupo Rancho Grande", which to this day convene every Tuesday for 2 hours to carry out an event called "Seminario Ranchero". During such event, different topics related to the operation of a cattle ranching are presented weekly. The speakers are professors of the university or Government guests and experienced cattlemen in the subject.

It is pertinent to mention that the University and the Program grant scholarships to students of the IAZ Program and the MCRNyP profile so that they may attend local and external technical-scientific events, thereby enriching students' academic formation and experience.

With regard to student association memberships, it's worth mentioning that students come together to form associations by State within the Mexican Republic from which they hail. However, there currently is no formal institutional employment agency, which represents an institutional limitation, and which the Program must make an issue to be resolved in the short term.

The financial resources allocated to the promotion of the Program are derived from those used for the national institutional promotion of all degrees offered by the UAAAN. Moreover, students of the program use the University's general facilities, in addition to those that are specific to the Program.

In relation to professional practices, these are carried out during the eighth semester and have a duration of 18 weeks. This has increased the willingness of the students to participate in research projects, which in some cases culminates in the preparation of thesis projects.

In the section titled Course Efficacy Assessment/Academic Program, there is a curricular map which shows the formation stages, distribution of credits, and the curricular balance that national assessment organizations suggest. According to student evaluations of each one of their professors, relevant actions are taken to improve the learning/teaching process.

It is important to mention that students next to graduate are not interviewed to obtain their opinion regarding the IAZ program. Even though there is an alumni directory on the university's website, in addition to information available regarding students carrying out professional practices, formal surveys for such groups have been standardized.

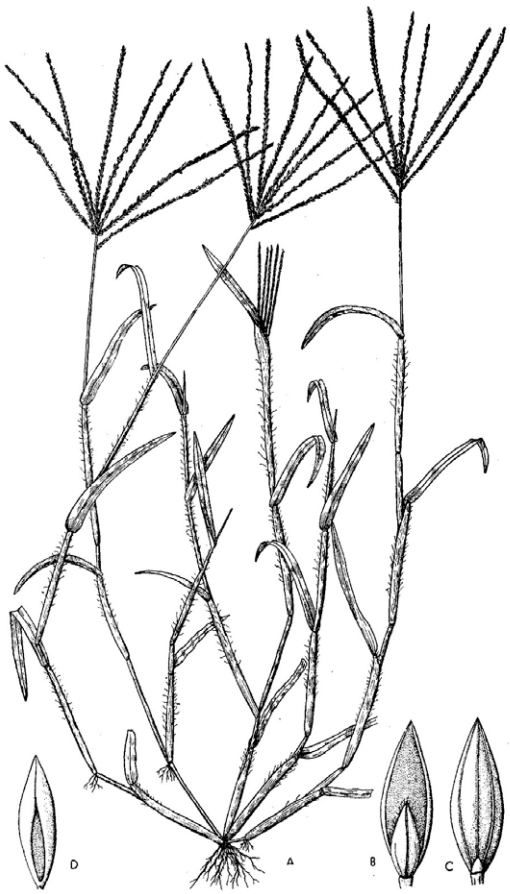
The feedback method for the operation of the Program takes place through the Integral System of Administrative and Academic Information (SIIAA for its acronym in Spanish) and through the System of Goals and Budget, where goals set, and financial resources used are tracked.

The students' progress is evaluated through several key performance aspects: alumni efficiency, approval rates, dropout rates, academic performance rate, among others, which are detailed within the document. The most important sources of ideas are the departmental and IAZ Program faculty, in addition to the reports provided by students returning from their professional practices. Data of the Pro-

gram's enrollment and alumni of the past five years is included in this document.

A product of its 95 years of operation within the field of agriculture, UAAAN has earned a regional, national, and international identity and is linked to forestry and agricultural producers, agricultural companies and livestock associations. The university forms part of the Mexican Committee for the Accreditation of Agricultural Education, which has recognized it for its institutional capability to provide superior education due to its rich resources (various lands suitable for farming, livestock, and forestry), library services, classrooms, labs, and full-time faculty.

Lastly, because it is an autonomous institution of national stature its financial resources are received directly from the federal government via the Secretariat of Public Education, and additional state secretariats, such as the Secretariat of Agriculture, Livestock, Rural Development, Fisheries, and Food (SAGARPA for its acronym in Spanish), and other national and international organizations.



1. CHARACTERISTICS OF THE INGENIERO AGRÓNOMO ZOOTECNISTA ACADEMIC PROGRAM

1.1 History of the Program

The Ingeniero Agrónomo Zootecnista Program (IAZ) is offered since 1971 when the institution received the name of Escuela Superior de Agricultura Antonio Narro. In 1975 after the consolidation as Universidad Autónoma Agraria Antonio Narro, this Program was under the responsibility of Animal Production, Renewable Natural Resources and Animal Nutrition Academic Departments of the Animal Science Division. The related topics to Rangeland Management were considered since the first stage of the Program, offering the subjects of Agrostology and Rangeland Management and Conservation. Later the first course was modified by Rangeland Plants and the course Rangeland Management and Conservation by both, Principles of Rangeland Management and Rangeland Management. In 1995 the course of Rangeland Inventory and Assessment was included.

The 2012 accreditation process by SRM (**2012 por la SRM**) initiated changes in the Rangeland Plants course, as well as the Sustainable Management of Rangeland Soils Courses as compulsory courses in the Curricula of the Natural Resources and Rangeland Management and Conservation terminal profile.

In 1995 the IAZ Program integrated to the Academic Student Affairs through the ¨Head of the Program¨. The organization of the University adopts the matrix departmental model for the implementation of academic, research and development programs (Figure 1). The matrix departmental model is an organization scheme integrated in the transversal axis by academic departments that work according to disciplines and in the perpendicular (vertical) axis by programs that work according to specific goals. These elements, academic departments and programs coexist complementary. Consequently, the basic organic structure of academic departments prevails as executors of the substantive activities of the University, with the interspersed of interdisciplinary programs. The IAZ Program is currently accredited for five years (2018-2022) by the Mexican Committee of Accreditation of the Agronomic Education, A.C (COMEAA). (http://www.comeaa.org/, Constancia Acred COMEAA).

In addition, personal values at UAAAN are promoted as can be read in the Institutional Development Plan Plan de Desarrollo Institucional 2013-2018, pags.45 y 46 where respect and tolerance, responsibility, honesty, integrity and commitment are highlighted. A way to promote these values is through the inductive courses for new (first semester) students, they are provided by a diary (pamphlet) which includes general information about academic aspects. These can be checked on the University website Departamento de Formación e Investigación Educativa. The Program also reflects these values in its Code of Ethics of the recently finished Development Plan, ended last year 2017 and currently being updated. These values are spread within the student and academic community as shown in later paragraphs.

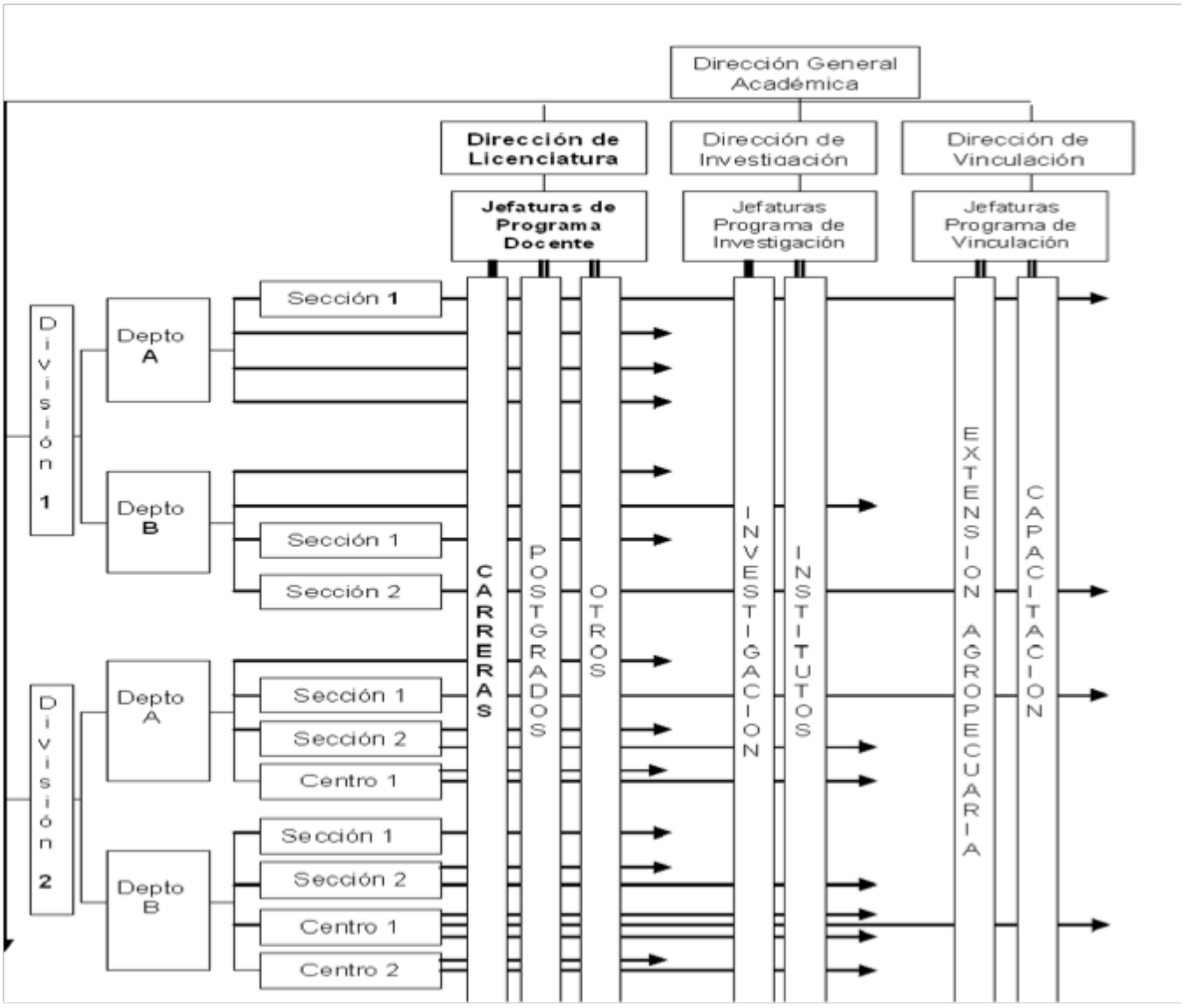


Figure 1. Matrix departamental structure of Universidad Autónoma Agraria Antonio Narro.

1.2. Mission, vision, objectives and goals

The IAZ Program mission, vision and objectives are explained in its Development Plan Plan de desarrollo IAZ 2007-17 (p. 6, 43 y 6-7), however there have been some agreements in the Program Academy related to changes in the mission, vision, objectives and goals of the Program Programa de mejora continua IAZ 2007-17 (p. 27-28), for updating and improving the Study Plans Actas reuniones Academia IAZ

Mission

To develop qualified, democratic, committed, and critical human resources, with values and national principles, able to contribute to the equal and sustainable development of the Mexican rural society, with emphasis the livestock industry, through a relevant study plan with a highly accredited academic staff.

Vision

To be a national and international well-known and relevant Program. Graduated student are competitive, with human commitment and bioethical values. With a competitive teaching staff supported by innovative teaching methods.

Objectives

- To increase the participation of professors in academic bodies (groups) and keep them in a permanent updating and certification processes, to promote competitiveness and integration into national and international cooperative and dynamic networks.
- To maintain excellence in curricula, professors and students through continuous updating.
- To achieve strength, growth, prestige and permanence through accreditation of the corresponding national and international organizations.
- To use information and technology to improve the teaching and learning process.
- To develop applied research programs and professional training, oriented to the improvement and the solution of problems in technological and scientific activities, with a global vision.
- To reach, encourage and promote the recognition and prestige of the teaching Program.
- To train students with a culture of quality that responds to the labor market expectations.
- To promote, close relationships and agreements with national and international organizations and institutions that promote the Program and community improvement.
- To develop holistically thinking human resources incorporating the adequate profile in the study plan of the IAZ Program, emphasizing the academic excellence, objectivity, intellectual honestity,

critical thinking and responsible freedom.

• To establish an adequate work environment within the University and the IAZ Program, to encourage students to develop their vocation.

• To increase and improve the physical space needed for students' efficiency.

• To encourage students to be conscious about the existing opportunities for professional services in the weakest rural communities in Mexico.

The mission, goals and objectives of the IAZ Program are consistent with the institutional ones. These are established in the Institutional Development Plan (PDI 2013-18).

Broadcasting of Mission y Vission institucionales is performed through the institutional web page, posters, pamphlets and brochures trípticos along the inductive course for new students. Code of Ethics of the academic Program is also published through posters, brochures and charts displayed around the main areas of the departments, so promotion is guaranteed to be displayed for the teacher and student community (Figure 2).

Figure 2. Poster of the mission, vision, and code of ethics of the IAZ Program.

1.3. The University academic structure

In the following link the academic and administrative structure is presented:

http://administrativo.uaaan.mx/calidadAcad/planeacion/organigrama.pdf

1.4. Relationship of the Program with other academic entities

The head of the IAZ Academic Program is the responsible of the daily operation of the Program. Also, serves as representative to other departments for the corresponding administrative management

(http://siiaa.uaaan.mx/marco/NormatividadInternaUAN/04-Estatuto_UAAAN_2006_CU.pdf)

Figure 3 shows the relationship between IAZ Program and other academic entities as well as the percentage of these entities' participation in the same Program, and in the graduate profile of the Natural Resources and Rangeland Management and Conservation profile.

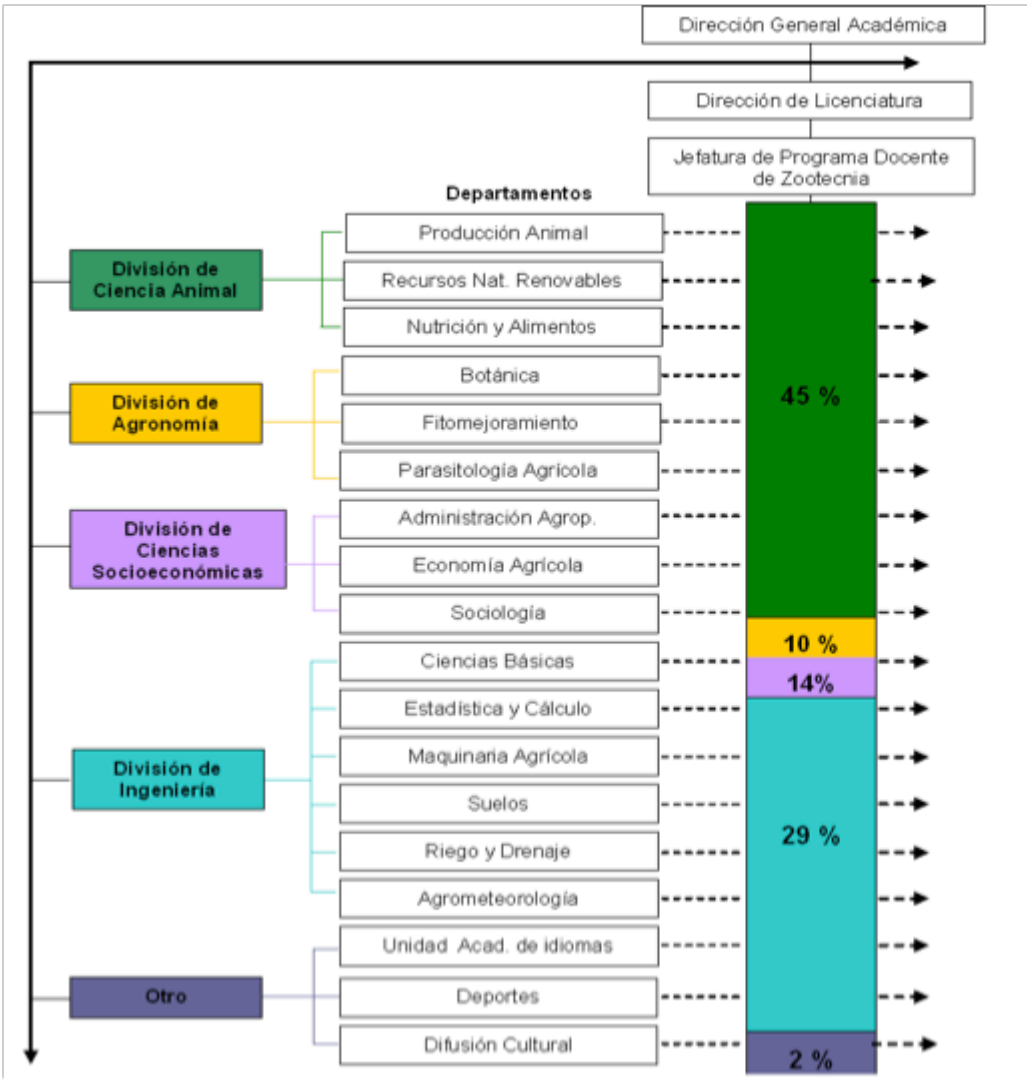


Figure 3. Relationship between the Program and other academic entities.

1.5. Recent changes in the Program

The last curriculum updating actualización curricular was implemented in August, 2013. Changes suggested by the SRM were made in 2013 which included the course of Sustainable Management of Rangeland Soils as a compulsory subject, and the change of the optional course Rangeland Plants, to mandatory. However the number of total courses remained the same. Table 1 shows the evolution of the Ingeniero Agrónomo Zootecnista Program.

Table 1. Evolution of the Ingeniero Agrónomo Zootecnista Program

Concept		Plan de Estudios (2013)
Subjects	Total	53
	Compulsory	42
	Optional	11
Professional practice		1 semester
Formation Areas of the Academic program	Basic	1
	Disciplinarian	1
	Terminal	3
		(includes MCRNP*).

The graduate profile of Natural Resources and Rangeland Management and Conservation was included in the 2007 curricular restructuration and the first graduated students finished their career in December 2011. Since then, 24 students have graduated with the profile, 3 enrolled in 2007, 2 in 2008, 2 in 2009, 2 in 2010, 4 in 2011, 6 in 2012, and 5 in 2013.

The creation of the IAZ Program responds to Mexico´s as well as worldwide rangelands problems and oportunities due to that they provide livelihood to domestic animals, habitat to wildlife, an elevated number of products and services, without considering they play an important role in the water cycle and other important ecological processes. Some authors define rangelands as follows:

- Rangelands are areas of low potential productivity due to physical constraints and therefore are not suitable for farming (Lund, 2007). They include any type of vegetation that is used extensively throughout the grazing of ruminants and domestic and wild herbivores; they are also vital sources of products such as minerals, water, wildlife and recreation (Stoddart et al. 1975; Heady and Child, 1994; Holechek et al. 2002).

- Twenty percent of the global area is range or grasslands, but this estimate does not consider that many of the forests, deserts and tundra can be classified as pastures (Stoddart et al. 1975). Other estimates (Williams et al. 1968) have indicated that 47% of the surface not covered by water falls

within the classification of grassland, with 10% of it cultivated, 28% forest and 15% land under ice, water and urban areas.

• Because grasslands are the cheapest source of feed, animals that are fattened on pasture or pens come from them, so pasture becomes the foundation of all beef cattle industry (Stoddart and Smith, 1975). Williams et al. (1968) estimates that ruminants and domestic herbivores meet 75% of its requirements from forage through grazing at rangelands and Holechek et al. (1989) has stated that herbivory is the essential process that characterizes the grasslands, with the interface plant/animal defining the heart of the rangeland management profession.

• The vast grasslands areas act as watersheds and receive precipitation through which aquifers are replenished or recharged (Cantu, 1984; Holechek et al. 2001). A well-managed rangeland is key to productive basins that provide water for agriculture, livestock, cities and industries (Stoddart, 1975). So, keep the rangelands in good condition is vital for the conservation of water resources and preventing the water cycle suffer imbalances (Branson et al., 1981). Water requirements in the future will increase considerably because of the continuous population growth and is expected to be one of the main constraints for humanity (Box, 1990; Chiras, 1991; Miller, 1993), so grasslands will become increasingly important as a source of water and forced conversion of cropland to grassland due to depletion of groundwater sources that previously were used to irrigate these areas (Cox et al. 1983).

• Rangelands are the habitat for numerous wildlife species. The position that considered fauna must be considered as a separate element of the grasslands was disputed for several years (Davis, 1961) and today wildlife is considered as integrated part of range and grasslands and its importance is comparable to that of cattle. This is considered both from an economic perspective, because the sale of hunting permits is an income that exceeds even that obtained by the production of domestic animals (Box, 1990, Ramsey, 1965), and from an ecological perspective because habitat conservation is the best way to ensure the survival of wildlife species, so it is essential to integrate the principles of wildlife management to range management. This is challenging for the grassland managers because of its complexity. Consequently, it is necessary to implement management strategies that maximize its production potential together with wildlife (Payne and Bryant 1994; Derner et al. 2006; Derner et al. 2009; Toombs et al. 2010; Fullbright et al. 2018).

Thus, the concept of grassland multiple use is becoming more and more important as forage production as a central objective is complemented by its utilization as recreation areas managed as protected natural areas (McCall and McCall, 1977; Hendee et al. 1978; Jubenvile, 1978; Knudson, 1980, Box 1990, Huntsinger and Hopkinson, 1996).

• Grasslands areas are a diverse source of goods and services from which ecosystem services stand out (Daily 1997; National Research Council, 2004; Millenium ecosystem assessment 2005; Hervstad 2007). As part of the ecosystem services of grassland, there are the hydrology environmental service payments conservation of biodiversity, carbon catchment and ecotourism. The carbon catchment is important in grasslands because it is considered one of the biggest carbon reservoirs due to the major carbon density of the huge surface as vegetation area (Follet et al. 2000; IPCC 2003; IPCC 2006; Harvstat 2007; Conant, 2010; Follet and Reed 2010; Splanger, 2011).

1.6. Expected improvement of the NRRMP for the next five to ten years

Rangeland management represents a national and international potential, continues to visualize itself as a science where the professor as a trainer of this discipline faces interesting challenges for the society, in this way the IAZ Program graduate NRRMP profile is committed to a close to medium term future to respond to changes and innovations to ensure an appropriate training in its professional practice, observing that valuable and meaningful teaching competencies are required to develop the educational practice, and this facilitates the labor insertion and professional growth of the graduates to manage sustainable criteria as well as values of ethics and humanism.

According to these circumstances, the IAZ Program must be able to strengthen the hiring of new and well qualified professors, as well as continuous updating of professional competencies of the current staff, in the context of globalization and the accelerated expansion of scientific and technological innovation.

In addition, it is required immediate action to establish strategies in an educational and administrative context to motivate and increase the number of students interested on this graduate profile, encouraging a dynamic knowledge training, abilities to self-manage, learning with a spirit of research, innovation and entrepreneurship.

1.7. Electronic links with information about the Program

Main links with general information about the University:

http://www.uaaan.mx

Information link of the Ingeniero Agrónomo Zootecnista Career:

http://www.uaaan.mx/portal/index.php/oferta-educativa/5-nivel-licenciatura/17-ingeniero-agronomo-zootecnista-.html

2. DEGREE CREDENTIAL

2.1. Documentation issued by the school records office

The Universidad Autónoma Agraria Antonio Narro provides the professional studies certificate (certificado de estudios profesionales) as well as the professional (bachelor degree) title of Ingeniero Agrónomo Zootecnista with Major in Natural Resources and Rangeland Management and Conservation.

2.2. Courses to obtain professional title

The courses for the Terminal Profile in Management and Conservation of Natural Resources and Grasslands are included in (Mapa curricular IAZ Perfil Terminal en MCRNP). In Table 2 a comparison in credit standards is presented for the specific concepts of ecology and management of SRM with those of the Terminal Profile in Management and Conservation of Natural Resources and Pastures of the IAZ. Total credits of the Program are sufficient, in comparison with the total credits suggested by the SRM.

Table 2 . Comparison of standards of the SRM with the Terminal Profile of Management and Conservation of Natural Resources and Pastures of the IAZ Program of the UAAAN for the category of specific topics of ecology and management.

Subjects of the terminal profile MCRNP	Credits SRM	Credits Equivalents*		Key of Courses**	
		Obligatory	Optative	Obligatory	Optative
Introduction to ecology and rangeland management	--	4 4	--	RNR-404 RNR-421	--
Ecology applied to rangeland	--	4	4 4	RNR-406	FOR-405 FOR-425
Methods for inventory and evaluation	--	4	--	RNR-467	--
Technics for vegetation management/habitat	--	4	4	RNR-431	RNR-453
Planning and solutions for rangeland management	--	4 4	4 4	RNR-422 RNR-470	RNR-450 FOR-468
Sum	**18**	**28**	**20**		

* Equivalent credits = credits UAAAN/2, * * All courses are level 400 (there is no differentiation by level as in the United States of America).

3. CURRICULUM AND TUTORING

3.1. Curriculum

The curriculum is presented according to the areas of knowledge established by the Society for Rangeland Management and Ecology (SRM) included in a program of ecology and management of grasslands (REM; Rangeland Ecology and Management). Table 3 make a comparison of the credit standards of the SRM with those of the terminal profile in the management and conservation of natural resources and grasslands of the Ingeniero Agrónomo Zootecnista career. It will be observed that the level of compliance of the UAAAN program is sufficient.

Table 3. Comparison of academic standards of the SRM with the profile of Management and Conservation of Natural Resources and Grasslands of the IAZ Program for the general concepts category.

Categories	**Disciplines**	**Credits SRM**	**Credits Equivalents***		**Key of the courses****	
			Obligatory	**Optative**	**Obligatory**	**Optative**
General Concepts	Biology	4	--	4 3	--	BOT-404 BOT-403
	Chemistry	4	4	--	CSB-413	--
	Edaphology	4	--	4	--	SUE-405
	Vegetal Taxonomy	3	4	4 4	BOT-405	BOT-409 RNR-404
	Quantitative concepts	9	5 5 5	3 4 4 4 4 4	DEC-410 DEC-425 DEC-430	DEC-464 DEC-467 SUE-456 RNR-403 RNR-439 RNR-475
	Natural Sciences (integratory subjects)	9	4 4 4 4	4 3 3 2	BOT-424 PRA-406 PRA411 CSB-421	BOT-422 NUA-475 RNR-408 RNR-463
	Management of Resources	9	4 4 4	4 4 2 4 4 4	RYD-426 RNR-431 PRA-441	RNR-481 RYD485 RNR-433 RNR-464 FOR-460 RNR-460
	Economy	3	4	--	ECA-403	--
	Communications	3	3	--	SOC-405	--
	Subtotal	**48**	**58**	**76**		

Specific concepts	Introduction to ecology and Range Management	--	4 4	--	RNR-404 RNR-421	--
	Applied ecology to range management	--	4	4 4	RNR-406	FOR-405 FOR-425
	Methodology for Inventory and evaluation	--	4	--	RNR-467	--
	Technics for vegetation management/habitat	--	4	4	RNR-431	RNR-453
	Planning and solutions for rangeland management	--	4 4	4 4	RNR-422 RNR-470	RNR-450 FOR-468
Subtotal		**18**	**28**	**20**		
Total		**66**	**86**	**96**		
Other courses		--	3	4 4	PRA-499	FOR-436 SOC-437

* Equivalent credits = credits UAAAN/2, * * All courses are level 400 (there is no differentiation by level).

3.1.1. General concepts

3.1.1.1. Biology (4 credits).

Optative courses:

BOT-404 Biology - 8 credits (3 hr. theory 2 hr. practice).

Biology as a science. Origin of living things. Concept of life. Evolutionary process of matter and the cell. Cellular organization and energy flow. List of autotrophs with solar radiation in the physical, chemical and physiological plant cell. Cell reproduction. Regulatory processes at the individual, population and community. Evolutionary theories.

BOT-403 Molecular Biology - 6 credits (3 hr. theory).

The course examines new theories, promoting an integrated study of knowledge to strengthen the understanding of molecular processes. Describe the characteristics of nucleic acids and its application to recombinant DNA technology.

3.1.1.2. Chemistry (4 credits).

Obligatory course:

CSB-413 Organic Chemistry - 8 credits (3 hr. theory 2 hr. practice).

Structure, composition and properties of organic compounds. Covalent bond, organic reactions, functional groups, nomenclature. Hydrocarbons, alkenes and unsaturated systems. Stereochemistry. Aldehydes and ketones, carbohydrates, carboxylic acids. Acid derivatives, lipids, amines, amino acids and peptides.

3.1.1.3. Soil Science (4 credits).

Optative course:

SUE-405 Soil Science - 8 credits (3 hr. 2 hr. practice theory).

Soil as a natural body, factors of soil formation, the profile and soil horizons, the processes of weathering, soli physical, chemical, biological and hydric characteristics.

3.1.1.4. Plant Taxonomy (3 credits).

Obligatory course:

BOT-405 General Botany - 8 credits (3 hr. theory 2 hr. practice).

It describes the characteristics, morphological, anatomical and physiological plant organs, using techniques and laboratory equipment to classify them according to their usefulness to ethics, responsibility and respect for the environment.

Optative course:

BOT-409 Systematic Botany - 8 credits (3 hr. theory 2 hr. practice).

Classification systems, according to their taxonomy, plants groups of economic importance to humankind.

3.1.1.5. Quantitative Concepts (9 credits).

Obligatory courses:

DEC-410 Mathematics - 10 credits (5 hr. theory).

Mathematical tools for analyzing function behavior of an independent variable, using differential calculus, real numbers, inequalities and absolute value, numerical analysis, algebra and geometry of linear

functions, power, polynomial, rational, exponential, inverse, logarithm and natural logarithms and trigonometric functions. The derivative: presentation of derivative as rate of change through its numerical and geometrical forms. Derivative of a function, its practical interpretation and derivatives theorems. Function optimization.

DEC-425 Statistic- 10 credits (5 hr. theory).
Statistics as a science. Systematic handling of phenomena involving random variations as well as develop critical thinking to understand the possibilities and limitations of experimental research. Basic elements of probability. Probability distributions and densities. Mathematical expectation. Discrete distributions. Continuous distributions. Random variables functions. Descriptive statistics.

DEC-430 Experimental Design - 10 credits (5 hr. theory).
Presents the basic principles of experimentation and analysis of key experimental designs used in research and agricultural sciences. It uses a wide variety of examples that illustrate applications of experimental designs, with emphasis on the interpretation of results. Computer programs are used for data analysis.

Optative courses:
DEC-464 Statistical Methods for Researchers - 6 credits (2 hr. theory 2 hr. practice).
Regression, sampling and nonparametric statistics. Relations between variables of biological and agricultural sciences interest. Basics of probability sampling and major non-parametric tests.

DEC-467 Probabilistic Sampling - 8 credits (3 hr. theory 2 hr. practice).
Description of probabilistic sampling techniques. Includes simple random, stratified, and systematic designs and an introduction to cluster sampling. It provides tools for market research and for diagnostic studies using survey data.

SUE-456 Geographic Information Systems - 8 credits (3 hr. theory 2 hr. practice).
Concepts and definitions of GIS geo-referenced information: entry systems, type and quality of data, databases and spatial models, the analysis of spatial and non-spatial modeling and mapping data output. Integration with remote sensing.

RNR-403 Photogrammetry and Photointerpretation - 8 credits (3 hr. theory 2 hr. practice).
Aerial photography, introduction to photogrammetry, photo interpretation philosophy, methodological phases of photo interpretation, use of the stereoscope, photo interpretation applications (agriculture, forests, forestry, geology, hydrology, etc.). Mapping systems and processes, basic and thematic cartography. Production of local or specialized thematic mapping. Integration with GIS and remote sensing.

RNR-439 Remote Sensing - 8 credits (3 hr. theory 2 hr. practice).
Active and passive remote sensing, electromagnetic energy, mapping, photogrammetry, photo interpretation, geographic information systems.

RNR-475 Agricultural Simulation Models - 8 credits (3 hr. theory 2 hr. practice).
Systems, types of models, the construction of computer models, evaluation and use of simulation for system analysis. Interactive processes, general models and simulation languages.

3.1.1.6. Integrated Natural Sciences (9 credits).

Obligatory courses:
BOT-424 Plant Physiology - 8 credits (3 hr. theory 2 hr. practice).
In this course we study the main functions involved in the synthesis, utilization and distribution of chemical energy in the plant. It also discusses the principles that regulate plant development and its relationship with exogenous and endogenous modulators. Water transport phenomena: hydric potential and its components. Basic metabolism: proteins and enzymes; photosynthesis (C3 and C4 plants, and CAM). Respiration. Lipid metabolism. Regulation physiology: hormones and Phyto regulators. Functional anatomy of each physiological process.

PRA-406 Anatomy and Physiology of Domestic Animals - 8 credits (3 hr. theory 2 hr. practice).
Farm animal's structure and function of major organs and systems. A well as vital physiological processes of domestic animals.

PRA-411 Reproduction Physiology - 8 credits (3 hr. theory 2 hr. practice).
Knowledge, skills and abilities for maximum permanent, sustained economic and animal production on rangelands, compatible with the conservation and preservation of these resources.

CSB-421 Biochemistry - 8 credits (3 hr. theory 2 hr. practice).
Water and biomolecules: carbohydrates, lipids, proteins and nucleic acids. Enzymes. Bioenergetics. Metabolism of basic compounds. Metabolic regulation and integration. Vitamins, minerals and trace elements.

Optative courses:
BOT-422 General Ecology - 8 credits (3 hr. theory 2 hr. practice).
The course begins with the history of ecology as a scientific discipline, its definition, and the object of study as well as its relationship to other sciences. Concepts and basic principles of ecology. Establishing interactions between organisms and their environment governing the functioning and structure of ecosystems as open systems, subject to change.

NUA-475 Rangeland Ruminant Nutrition- 6 credits (2 hr. theory 2 hr. practice).
Assessing the diet of grazing ruminants throughout the year. Designing supplements for grazing animals.

RNR-408 Ethology - 6 credits (2 hr. theory 2 hr. practice).
This course examines the behavior of animals through the knowledge of individual and social behavior development and behavioral patterns common in domestic animals (sexual, nutritional, etc.). As well as the interaction of these factors with the environment.

RNR-463 Rangeland Hydrology - 4 credits (2 hr. theory).
The hydrologic cycle, watershed, drainage system characterization, rain probability, water runoff volumes estimates, hydraulic expenditure estimates; infrastructure for water collection.

3.1.1.7. Resource Management (9 credits).

Obligatory courses:

RYD-426 Use and Water Management - 8 credits (3 hr. theory 2 hr. practice).

Hydrology, precipitation, infiltration, evaporation and runoff. Uptake of dams and levees for agricultural and livestock.

PRA-441 Beef Cattle - 8 credits (3 hr. theory 2 hr. practice).

Status of beef cattle industry. Identification of genetic, environmental, and management factors involved in the different production systems of beef cattle, assess their business, identify problems and provide solutions.

Optative courses:

RNR-481 Watershed Management and Land Management - 8 credits (3 hr. theory 2 hr. practice).

Watershed definition, hydrologic regions, characterization of the basin; climate data, return periods and probabilities of rain; runoff volumes; use of streams and water bodies, hydrogeology, regional and local flow. The basin hydrothermal balance, the current erosion and the potential use of the basin. Diagnosis and proposed watershed conservation.

RNR-433 Hunting Organization - 4 credits (2 hr. theory).

Importance of wildlife, monitoring, conservation, sustainable use, wildlife general law.

RNR-464 Management of Parks and Reserve - 6 credits (2 hr. 2 hr. practice theory.

Knowing the legal framework, manage and rationally utilize protected areas and reserves.

FOR-460 Forest Management - 8 credits (3 hr. theory 2 hr. practice).

Analysis and discussion of technical and legal bases of forest ordination and forest management: assessment, forest and environmental laws and applicable Mexican Official Standards. Link between ecological principles, forest farming and environmental assessment, and techniques of forest regulation. Management planning of forest resources to form normal forests, under the concept of sustainable and multiple uses of forest resources.

RNR-460 Wildlife Management - 8 credits (3 hr. theory 2 hr. practice).

Importance of wildlife administration, use, management, utilization and conservation in a sustainable concept. Legal procedures for wildlife resource management. Management application for different times of use and exploitation.

3.1.1.8. Economics (3 credits).

Obligatory course:

ECA-403 Agriculture and livestock economy - 8 credits (3 hr. theory 2 hr. practice).

This course introduces fundamental concepts of economic theory; a review of aspects of the Economic System and its component sectors, and review of aspects of supply and demand of agricultural and livestock products.

3.1.1.9. Communication (3 credits).
Obligatory course:
SOC-405 Oral and Written Communication Workshop - 6 credits (2 hr. theory 2 hr. practice).
The importance of oral and written communication. Language and communication. The role and responsibility of the communicator. Effective communicator skills. Forms and structures of the oral and written communication.

3.1.2. Rangeland Ecology and Management Specific Concepts

3.1.2.1. Introduction to Rangeland Ecology and Management
Obligatory courses:
RNR-404 Range Plants - 8 credits (3 hr. theory 2 hr. practice).
Importance, distribution, morphology, collection, identification, taxonomy, and ecology of plants in Mexico's rangelands, mainly in arid and semiarid environments.

RNR-421 Rangeland Management - 8 credits (3 hr. theory 2 hr. practice).
Concepts, history, vegetation types, ecological zones, rangeland ecology, rangeland condition and trend, water-soil-plant-livestock relationship, rehabilitation, grazing systems.

RNR-406 Renewable Natural Resources Ecology - 8 credits (3 hr. theory 2 hr.-practice).
Concepts of rangeland ecosystems, major ecological regions where livestock is operated under grazing conditions. Inventory, condition, trend, succession and use of rangelands. Grazing as an ecological factor.

Optative courses:
FOR-425 Wildlife Ecology - 8 credits (3 hr. theory 2 hr. practice).
Main species, distribution, habitat, interaction with the physical and biological environment.

FOR-405 Forest Ecology - 8 credits (3 hr. theory 2 hr. practice).
Major environmental factors affecting the presence, density and productivity of forest species. Management methods for each main type of vegetation. Minimum environmental impact requirements, high stability and high yield.

3.1.2.2. Inventory and Assessment Methods
Obligatory course:
RNR-467 Rangeland Inventory and Assessment - 8 credits (3 hr. theory 2 hr. practice).
Importance, rangeland health, sampling, density, frequency, cover, vigor, production, use, diet composition, animal and wildlife behavior. Evaluate their potential use in a sustainable manner.

3.1.2.3. Vegetation/Habitat Management Techniques
Obligatory courses:
RNR-431 Wildlife - 8 credits (3 hr. theory 2 hr. practice).
Knowledge of the economically important species, their habitat uses and their conservation.

Optative courses:
RNR-453 Holistic Resources Administration- 8 credits (3 hr. theory 2 hr. practice).
Manejo integral y racional de los recursos naturales en las áreas ganaderas en forma sustentable.
Comprehensive and rational management of natural resources in livestock areas in a sustainable manner.

3.1.2.4 Planning and Problem Solving
Obligatory courses:
RNR-422 Sustainable Management of Pasture Soils 8 credits (3 hr. theory 2 hr. practice)
Landscape analysis and determination of the phenomena and factors of origin to the physiography. Physical, chemical and microbiological processes of the grassland soils and the condition of the pasture site according to the soil.

RNR-470 Rangeland Rehabilitation - 8 credits (3 hr. theory 2 hr. practice)
Importance, ecological rehabilitation, rehabilitation processes. Restoration of rangeland productivity through physical, chemical and biological means.

Optative courses:
RNR-450 Environmental Impact - 6 credits (2 hr. theory 2 hr. practice)
Environmental impact analysis, including concepts, legal and administrative framework, methods and evaluation techniques as well as measures to mitigate and monitor impacts generated by development projects.

FOR-468 Environmental Impact Assessment - 8 credits (3 hr. theory 2 hr. practice)
Environmental problems at global, national and local levels. General methodological to environmental impact studies. Environmental legislation on environmental impact, laws, regulations and official standards. Identification methods and qualitative, semi quantitative and quantitative impact assessment.

RNR-461 Sustainable Strategic Management of Livestock Enterprises- 8 credits (3 hr. theory 2 hr. practice)
Knowledge and skills on sustainable strategic management applied to livestock businesses, provide the fundamental concepts, know the main theories and modern tools to understand and implement strategies and objectives in Livestock companies looking to be more competitive, profitable and socially responsible.

3.1.2.5 Other courses
Obligatory courses:
PRA-499 Professional Ethics and Values - 6 credits (3 hrs. theory).
Manage a set of values, with an attitude of reflection and the use of reason, for ethical professional performance, applying the technique of communities of inquiry in case analysis.

Optative courses:
FOR-436 Forestry and Environmental Law - 8 credits (4 hrs. theory)
Study of the official rules and regulations related to forestry and environmental activities.

SOC-437 Forestry, Agriculture and livestock Legal Framework - 8 credits (4 hrs. theory)
Knowledge of laws, regulations and rules governing forestry, agriculture and livestock activities in Mexico.

3.2. Tutoring and/or Counseling

The IAZ Tutoring Program began in August 2007 with students entering the terminal profile of Conservation and Management of Natural Resources and Pastures Major (http://administrativo.uaaan.mx/tutorias/login.php , Reglam tutorías UAAAN 07). On the one hand, students are assigned a professor and meetings between them are scheduled the last Friday of every month.

On the other hand, the academic counseling sessions are carried out daily by the professors who participate in the program, without a specific timetable and at the request of the students that require them. This activity is recorded in the tutoring system in the chapter of academic consultancies as shown in Figure 4.

It is important to mention that all students who achieve a theses tesis or monograph are advised by a special committee composed of three professors, one of them is the principal advisor and the others as Co-advisers.

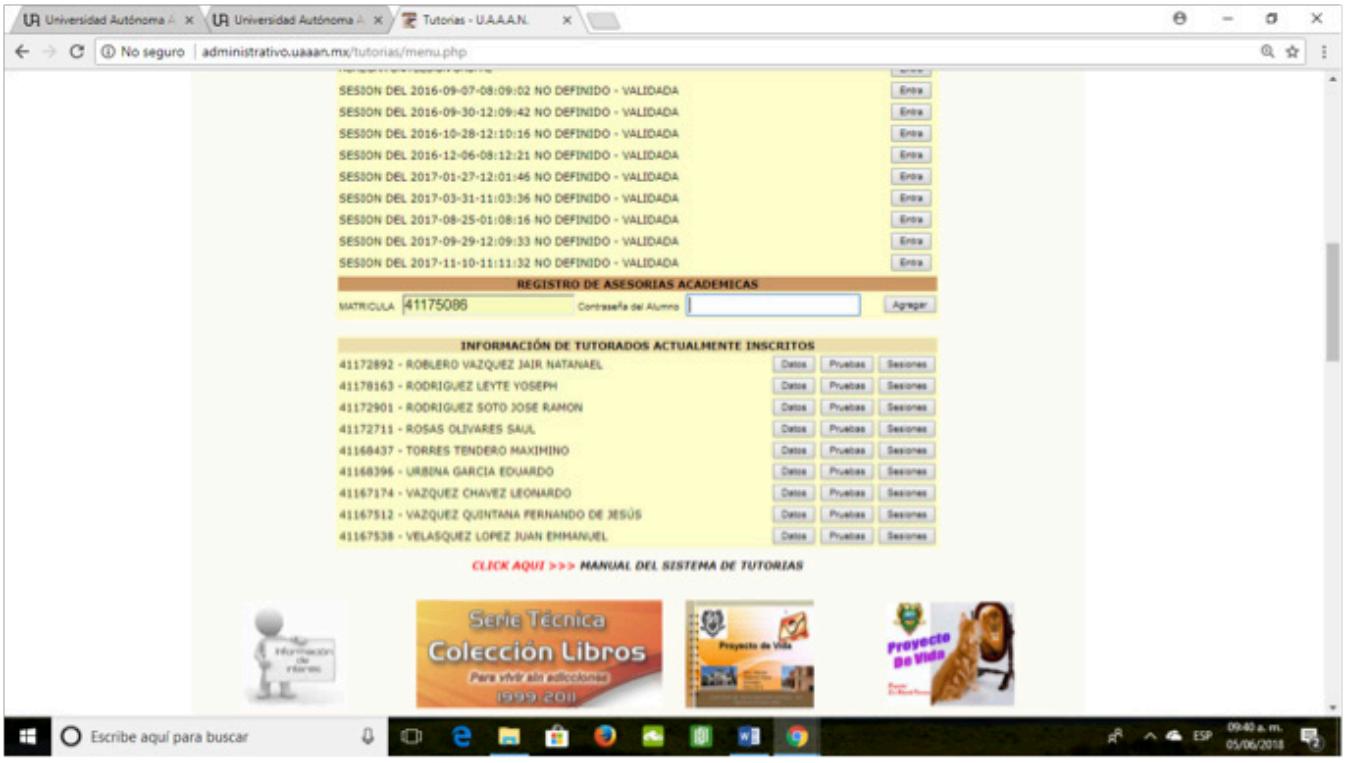


Figure 4 Screenshot, registration of academic advisories in the institutional tutoring system SIIAA.

4. PROFESSORS OF THE ACADEMIC PROGRAM

The courses on specific concepts of the Program are taught by nine professors from the Department of Renewable Natural Resources, six of them have a doctoral degree. Another 10 professors (five with the degree of Doctor of Sciences) teach general concept courses.

4.1. Curricula vitae of professors of the Natural Resources Department

The curricula of the professors of the Department of Renewable Natural resources that participate in the terminal profile of Management and Conservation of Natural Resources and Grasslands of the IAZ Program are presented in Curricula profesores.doc.

4.2. Summary of teaching activities, tutoring and counseling of professors

The relationship of professors of the Department of Renewable Natural Resources and their academic productivity, research and development are registered in the Integral System of Academic and Administrative Information (SIIAA). It is presented briefly (Ficha técnica 2014-2017). In addition to the complementary information of each professor regarding their productivity (Información complementaria).

4.3. Description of the role of administrative/practical policies to develop excellence in education.

The University has the procedures outlined in the Manual de Procedimientos Para Implementar Actividades de Superación y Actualización del Personal Académico de la UAAAN to organize, coordinate, promote and implement the activities of improvement and updating of academic staff through the training of teachers, as well as their participation in technical scientific events in the field of their profession. Table 4 describes the participation of teachers in improvement and updating activities in the Ingeniero Agrónomo Zootecnista Program in the last 3 years (Ficha Técnica No. 2).

Table 4. Participation of PTC of the IAZ Program in courses and / or congresses (2014-2016).

Year	Faculty attending Courses and/or Congresses	Total	% participants
2014	7	27	42.8
2015	8	25	46.6
2016	5	29	28.5

The University in its Collective Labor Contract Contrato Colectivo de Trabajo mentions that it is obliged to implement with a staff training program, grant licenses for courses, seminars, as well as to perform mobility with other institutions through a sabbatical period, all based on clauses 148 , 150, 154 and 126; likewise there is a Regulation for the realization of a sabbatical period Reglamento para la realización de un periodo sabático, where the interested professor presents his project to the Academy of the Academic Department for its authorization and after it is authorized, the Head of the Department carries out the management for the processing of the period to the General Secretary.

The University through the Academic General Direction has implemented actions to promote the mobility and academic exchange of professors and students through the framework agreements convenios marco established with institutions such as UNAM, Universidad Autónoma Chapingo, among others.

The University recognizes its academic staff for an indefinite period, full-time and part-time, through an annual bonus based on clause 93 of the Contrato Colectivo de Trabajo. The Institution manages at the Ministry of Finance and Public Credit the Programa de Estímulos al Personal Docente (PEDPD), for which it establishes its regulations, model to be evaluated and calling convocatoria. In (Ficha técnica No._ 2) the stimuli received are presented for each PTC and in the stimulus section for productivity.

The Contrato Colectivo de Trabajo establishes in clause 136 in support of scientific and technological productivity of academic staff through the Research Direction or Graduate Sub-direction to support 75% of the annual registration cost to a national and to an international scientific association; likewise the cost of publication of the works approved by the editorial committee in indexed scientific journals and supports 50% of the cost when it comes to patent registration.

In addition, the Research Direction of the Institution recognizes the effort of the research professors, granting through the payment by publication of scientific articles indexed and by the achievement of Title of Obtentor. The current administration recognized some professors who have distinguished themselves in their trajectory and academic performance in classes, as well as stand out in development and research projects (http://www.uaaan.mx/v3/index.php/noticias-de-la-universidad/1649-se-efectua-desayuno-en-honor-a-la-base-magisterial-de-la-uaaan).

4.4. A list of other faculty categories

At UAAAN research faculty is the only existing category, whose members have been mentioned in previous lines.

4.5. Teaching assistant list

There is no such category at UAAAN. For the replacement of an academic technician, the degree is undergraduate or graduate and the professional technical profile is defined by the departmental academy according to the programs and laboratories that require them.

4.6. List of authorized vacancies

There are precedents for the implementation of a program of replacement of the faculty for retirement of the University since 2008. Currently, policies have been implemented for the teacher hired as a replacement to fill a vacant position derived from retirements, which must be documented and justified. In addition to being endorsed by the departmental academy, accordance with the procedure described in Manual para el Procedimiento de Selección y Contratación del Personal Académico de la UAAAN and meet the academic profile requirements defined by each departmental academy, according to the educational programs where it will participate, in addition to satisfying the following institutional requirements:

1.- Have a Doctor's degree

2-. Belong to the National System of Researchers (SNI). In case of not belonging to the SNI, candidates should have the possibility to enter in the next 2 years.

3.- Verify knowledge of the English language with an institutional TOEFL exam with a minimum score of 500 points or equivalent TOEFL iBT Exam.

Today, because of the offer of highly qualified young professionals, who have the degree of Doctor of Sciences, a training human resources program is not required. The new hires are convened with the purpose of giving opportunity to the high level human resources already trained in Mexico and abroad.

In February 2018 the Department of Renewable Natural Resources hired a professor and researcher: Dr. Juan Antonio Encina Domínguez to attend the Ecology areas of Natural Resources and Grassland Plants. In addition, to support the area of forage production and conservation, Dr. Perpetuo Álvarez Vázquez was hired in May 2018.

4.7. Description of how research, extension / dissemination is used to complement teaching and counseling.

The Research Direction (hereinafter DI) is the formal body which, based on the internal regulations (Reglamento de Investigación), plans, regulates, promotes, monitors and evaluates the results of the institutional activities of research, technological development and innovation carried out by the academic staff as part of the training of students in the different undergraduate and graduate academic programs. It also promotes the dissemination of results and contributes to the registration and intellectual protection of the same.

With the annual approval of the budget project of the University by the H. University Council, the financial resources for institutional research activities are assigned. The processes developed in the DI already indicated in the previous paragraph are described in the Manual_de_presentación_de_proyectos.

In addition to the processes to carry out the projects with internal resources, the DI manages and supports the procedures required by the researchers who attend the external calls issued by public entities of the federal government such as: CONACYT, PROMEP (PRODEP), CONAFOR, CONABIO, SEP, state and municipal governments, as well as entities and private companies. To this type of projects linked with public or private institutions, technical follow-up is given by the area of special projects of the ID, and the financial resources are administered by the special projects area of the General Administrative Direction. (Reglamento para Operación de Recursos Propios y Proyectos especiales de la DGA).

The Department of Validation (DV) of the DI, is the body that promotes and encourages the publication and dissemination of the results of research projects. Through the DV, economic stimuli for research professors are managed by publishing articles in indexed journals and books with ISBN registration. The same DV supports in the management and payments of the required procedures for intellectual protection, the registers of plant varieties, copyright and national patents. (Procedimientos para protección intelectual). Under the processes operated in the ID, in table 5 the projects that were authorized to the research professors of the IAZ Program in the period 2014-2016 are shown.

In addition, 16 development or extension projects were carried out with the producers by 11 teachers with participation of IAZ program students

Table 5. Number of research projects developed by full-time professors of the IAZ Program in the period 2014-2016

Professor Researcher	Year	Registered Projects
Jesús M. Fuentes Rodríguez	2014	0
	2015	2
	2016	2
Fernando Ruiz Zarate	2014	0
	2015	2
	2016	2
Ricardo Silva Cerrón	2011	0
	2012	0
	2013	1
	2014	0
	2015	0
Miguel A. Mellado Bosque	2014	2
	2015	3
Laura O. Fuentes Lara	2014	1
	2015	1
Camelia Cruz Rodríguez	2011	2
	2012	2
	2013	2
	2014	2
	2015	0

José E. García Martínez	2014	3
	2015	3
	2016	2
Ramiro López Trujillo	2014	0
	2015	0
	2016	1
Ramón F. García Castillo	2014	2
	2015	0
Luis Lauro de León González	2014	2
	2015	1
	2016	2
Luis Pérez Romero	2014	2
	2015	0
Eloy Alejandro Lozano Cavazos	2014	0
	2015	2
	2016	2
Álvaro Fernando Rodríguez Rivera	2014	2
	2015	2
Ricardo Vásquez Aldape	2014	1
	2015	0
Myrna Julieta Ayala Ortega	2014	2
	2015	0

Source: Own using SIIAA data

5. EXTRACURRICULAR PROFESSIONAL DEVELOPMENT

5.1. Structure of student teams

a). International Rangeland Plants ID team.

Since 1976 this team is integrated by a group of 10 to 12 students. They participate in the rangelands plant identification contest, which is regularly held at the annual SRM meetings. Every august around 40 students form the group in the first stage, in February of the following year 10 to 12 students are selected to be part of the institutional representative team. The equipment has a cubicle attached to the Plant Rangeland Laboratory in the building of the Department of Renewable Natural Resources, of the division of Animal Science. It has furniture and computer equipment for permanent use, even outside the pre-competition training period (Equipo identif pastos.docx, Equipo identif past.ppt, Video EIIPP 2018).

b). Grupo Rancho Grande" (Big Ranch Student Group).

Last 2016 year, a student group that is called "Grupo Rancho Grande" (Big Ranch Student Group) started to work on the extensive cattle ranch theme. All the students interested in training and learning how to operate a cattle ranch is incorporated in a group that get together for two hours period every Tuesday to attend an event called "Seminario Ranchero" (Seminar for ranchers). A different aspect related to a cattle ranch operation is presented every week. Instructors are invited professors or cattlemen with an special experience.

5.2. Attendance at technical-scientific meetings and/or Congresses

The students of IAZ attend meetings and/or technical-scientific congresses organized by the University and by the Division of Animal Science, invited by the organizers of the event and/or by the professors' initiative. Evidence of this is presented by the International Symposium on Natural Resources organized in October 2016 (convocatoria). In the same way they attend to technical-scientific meetings and/or congresses outside the university by the initiative of the professors.

5.3. Student funding to attend to scientific meetings and/or technical congresses

Every year the university organizes and finances events within the institution. (Programa Simposio Internacional de Recursos Naturales, Semana Internacional de Producción Animal) and provides funds for students to attend to extra-university events (Congreso de Manejo de Pastizales SOMMAP 2017).

5.4. Membership of associations

The integration of student groups in the university, is carried out according to the State of origin or the cultural activities practiced by the students (Difusión Cultural-Zoot). Students also have a general organization called the Student Society. In Mexico there is the College of Agronomists which has representation in all the States of the Republic (http://www.uaemex.mx/pwww/ciaem/). And the UAAAN Alumni Association.

5.5. Job Market

Formally there is no institutional program for Labor insertion (http://www.uaaan.mx/egresados/index.php/bolsa-de-trabajo)However, applications are often received from companies, government agencies, producer associations, foundations, among others. This is usually through the telephone line to department heads or professors. The information is then displayed in the information panels and the stakeholders are given facilities to communicate to the application sites.

5.6. Resources to help the recruitment and professional development of the students.

The applicant who wishes to enter the Program of the career of Ingeniero Agrónomo Zootecnista must possess the following characteristics:

School Background

Basic knowledge of biology, chemistry, mathematics, physics, ecology and Informatics and elementary knowledge of the English language.

Full-time availability and discipline for studying.

Skills to express themselves in an oral and written manner.

Capacity for individual and team work, as well as the management of equipment, tools and laboratory reagents.

Participation in sports and cultural activities as a fundamental part of individual wellbeing and sustenance for integral and professional training.

Studying habits

Discipline, dedication and motivation towards study and reading in and out of the classroom is fundamental.

Values and attitudes

Honesty, ethics, seriousness, responsibility, initiative, respect for oneself, people, institutions and nature.

Interests and motivations

Interest in the livestock problems and natural resources of the country, in maintaining contact with nature, with aptitude to work in activities that are developed outdoors and ability to understand biological phenomena.

Expectations of training and professional practice

Vocation of service, disposition to acquire skills and desire for personal improvement, skills to develop field work, to relate to the agricultural sector, to perform successfully in the rural environment and identify with it.

Selection and acceptance process

The process of selecting applicants to enter the University considers the national promotion of careers (http://administrativo.uaaan.mx/sdesarrolloed/Convocatoria2018.pdf) and dissemination of the selection exam and entry profile; this includes diptychs, leaflets, posters and pamphlets. La promoción is also done on-site, by trained teachers for that purpose, in approximately 500 high schools in the country. During these promotion visits the places and the dates where the selection exam will be applied are announced. Accepted students are the ones who get the best grades (http://administrativo.uaaan.mx/sdesarrolloed/informe17.pdf). The receipt of the documentation for the entry to IAZ is the responsibility of the School Control Department (Reglam Acad alums Lic). And it is made of the knowledge of the applicants via electronic means and in office. The following guidelines are mentioned and facilities available to improve student learning:

a) Capacity for attention to groups. By internal regulations, registrations to the curricular courses must not exceed 30 students per group. (Saturación_grupos).

This is regulated by the enrollment process of the students to each course where it appears at the top of the sheet the maximum number of students who can enroll; once the indicated quota has been covered, no one else can register to this course without the authorization of the professor responsible of the subject. Registration is via the Internet by entering the graduate school control page.

b) Adequacy of the equipment of the classrooms and their versatile use according to the needs of the curriculum, with video equipment. Of the 84 classrooms of the institution, 14 are equipped with projector, electronic whiteboard and video equipment; eight classrooms only have projector and screen (aula-inteligente_Uso¬_Polivalentes).These classrooms are at the disposal of the IAZ Program after request of the teacher responsible of the subject.

c) Adequacy of equipment (furniture, lighting, ventilation, temperature, adaptations for people with different capacities, among others).

These 84 classrooms are mainly located in the buildings A, B, C, D, E and F. (Plano_aulas)., (Fotografías_edificios_aulas). The classrooms are equipped with desks, whiteboard, chalk board, chair and desk for the teacher. The classrooms also have doors, windows, sufficient lighting and ventilation. All classrooms have electric light contacts to use projectors and overhead projectors (aula_uso_normal). Spaces such as labs, multi-use classrooms, auditoriums and computer center classrooms are also used by professors of the Program to teach their classes (aula_uso_múltiple), (aulas_Centro_Cómputo_Académico). As for the adaptation of facilities for people with different capacities, ramps have been built with handrails between the different buildings of classrooms, auditoriums, administrative buildings, computer center and in sports areas, which has allowed people with disabilities to move more safely and easily (Fotografías_rampas).

d) Hour/week/semester usage rates. Enrollment of students enrolled in the program ranges from 355 to 474. The teaching and educational staff of the program occupies between 17 to 20 classrooms per semester, at different times a week. The index or percentage of occupancy of these classrooms is 85% estimated based on the number of courses/hours/week/semester.

Auditoriums

The institution has the appropriate facilities for the development of technical-scientific events of different nature where simultaneous exhibitions can be coordinated. In these facilities, congresses, symposia, conferences, conventions and forums of national and international character is developed. Table 6 lists the auditoriums and classrooms for institutional events and their capacity for occupancy.

Table 6. Lists the auditoriums and classrooms for institutional events and their capacity for occupancy.

Name	Capacity of seats
Aula Magna-Edificio La Gloria	80
Carlos E. Martínez	500
Eulalio Gutiérrez Treviño	250
Posgrado	100
Recursos Naturales	60
Ciencia Animal	80
Maquinaria Agrícola	100
Riego y Drenaje	60
Edificio Administrativo	70
Fitomejoramiento	60
Forestal	100
Aula Virtual en la División de Socioeconómicas	80

All these facilities are functional, well conserved, equipped with comfortable armchairs, screen, projector, lighting, air conditioning and periodic maintenance for proper functioning (auditorios UAAAN).

Language department

The Academic Unit of Languages is an area that depends on the Teaching Direction. Today there are 5 levels of English, TOEFL preparation course, specialization courses such as conversation, reading and business to more than 950 students of the different careers of the university every semester. In the 2017

activity report of the Academic Language Unit el Informe de Actividades 2017 de la Unidad Académica de idiomas, the number of courses and number of students participating in each level per school year from 2014-2017 can be observed.

Computer center

The institution has an Academic Computer Center (CCA) which has the function of providing computer services to students, teachers and administrators of the university, located on an area of 823.50 m2 with the following characteristics: The Academic Computing Center operates to control access and management of print and storage resources with a LAN network under the Windows Server operating system, Windows 7 Professional and Windows 8.1; and in its stations with Professional Windows 7 and Windows 8.1; Validating access through the Computer Reservation System (SIREC), programmed in Visual Studio 2010 Language and Database Manager SQL Postgres. For its operation, this system is linked to the general database of the Integral system of Academic and Administrative Information (SIIAA) of this University.

The network management system allows to carry access control, remote monitoring of stations, which is registered by the student's registration number. For its operation, the necessary software with licensing for the most common applications is installed in every station, which is provided by the Informatics and Telecommunications Sub direction, in terms of the academic programs, these are provided by the professor and researcher who will teach the subject.

Library

There is the Information and Documentation Center (CID) in the library of the University named "Dr. Egidio G. Rebonato", which covers the needs of users involved in silvoagropecuaria science, as described: The information and Documentation Centre has a surface area for its administrative sections 205 m2 that added to 3,767 m2of area in its library, has a total of 3,972 m2. The library has all the necessary and adequate furniture to facilitate the reading of books. Due to the characteristics and design of the building it is possible to have adequate lighting, ventilation and temperature, in addition to being in a temperate region with an average temperature of 26 °c in the hottest months. In the case of people with different capacities, there are two spaces with ramps in the parking area and there is another one to access to the main building.

Food service

The university dining room service has capacity for 500 diners, serves more than 90% of the student population and provides 3 food service 7 days a week. There are also defined cafeteria areas and food stalls which are located near the classrooms and offer their services throughout the day. (Comedor y cafeterías).

Sports areas

The university has a sports area in which all the necessary facilities are concentrated so that the students can practice their favorite sport, like basketball, volleyball, soccer, track and field, football, baseball and

boxing. In such a unit there is also a gym for the physical conditioning of the members of the school representative teams or any student who wants to access to it (Fotos Deportivo).

Cultural Events

The cultural and recreational activities are carried out in various places such as the auditoriums, the main avenue of the University and the esplanade of La Gloria building that is traditionally used for various agricultural exhibitions, livestock, food and pictorial samples. The lobby of the auditoriums and library are also used for exhibitions of various types of works, the library has three reading rooms for special events and the Department of Cultural diffusion often programs the projection of thematic, cultural and entertainment films.

All the spaces mentioned above are in good construction conditions and are functional to support the different activities carried out by the IAZ Program.

The professional development of students is encouraged via their participation in agreements with different sectors of the society (Convenios de Rectoría). In addition, in a curricular (compulsory) manner, students must provide social service under the guidance of professors or activities such as: literature review, field assistants in research, typing and integration of information, collection and editing of digital images. At the invitation of professors, some students participate as co-organizers of different events that are carried out in the university, such as: International Symposium on Natural Resources, Ranchero Seminar, the congresses of the SOMMAP, Animal Production week and others.

5.7. Ways to encourage professional practices with companies and their promotion among the students.

The IAZ program, through the University has benefited from the agreements with the different sectors of society. With the purpose of promoting among students, visits, school practices, thesis work, mobility and professional practices from 2014 to 2016, collaboration agreements have been signed with educational institutions, official bodies, private companies, municipalities and states (Convenios de Rectoría).

In the last five years, the Program has made linkage with entidades receptoras in different States of the Republic, where 9th graders of the Program have carried out their professional practices.

The professional practices in the program are carried out in the ninth semester and have a duration of 18 weeks, and for its realization it is mandatory for the student to be regular and must have completed his social service. The semester of practice for every student is assessed by a professor assigned by the Head of the Program the evaluation is carried out based on the fulfillment of a working program, monthly and final reports, besides an oral presentation at the end of the semester.

The procedure for professional practices in schematic form is shown in Figure 5 and starts when the student selects the Receiving Entity (ER). At this point the student can establish some ER of his interest or select it from those who respond to a previous call made by the head of the Academic Program, of the ERs that have previously received students. Subsequently the official acceptance of the ER by the IAZ Program is formally established and that of the student by the ER that is formalized by an external tutor in the ER and a responsible teacher in the IAZ Program. There is an established working program by

the pupil and his external adviser, the mandatory monthly technical reports and a final technical report endorsed by the external advisor.

On his return at the end of the semester, the student exposes his experiences in an oral presentation where he is evaluated by a committee, to accredit his semester of professional practices Lineamientos Generales para la Realización de Prácticas profesionales).

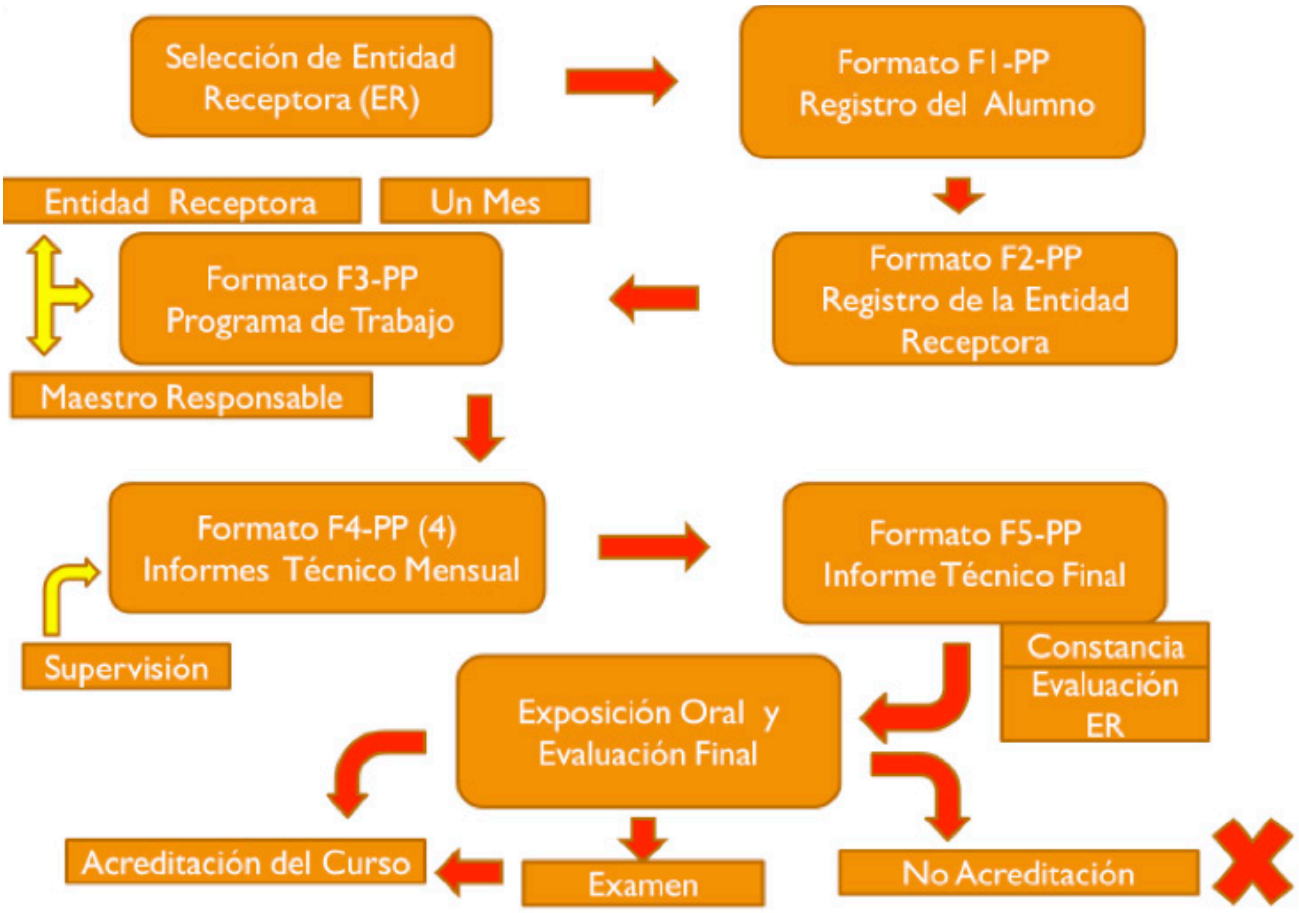


Figure 5. Schematic representation of the process of professional practices.

The University has regulations controlling the development of professional practices (Reglamento de prácticas profesionales).

5.8. Ways of encouraging teachers to carry out research with undergraduate students and a way to make them aware of the students.

The conduct of research in the university is one of the contractual functions of the professors (Contrato Colectivo SUTAUAAAN.pdf Page 5, clause 11). In addition, the professors have incentives to carry out this activity: project financing (Conv proy inv 2018), economic recognition in the Program of Stimulation to the Teaching Performance of the Teaching Staff (Reglam, mod eval y glosario PEDPD 17, http://pedpd.uaaan.mx/), encouragement to enter the National System of Researchers and contributions for the payment of publications as well as sabbatical period (Reglamento Periodo Sabático.doc).

Students are invited to participate in research through tutoring, publication of thesis topics related to the research projects carried out by teachers. Undergraduate students who carry out their thesis work are candidates for obtaining a support scholarship granted by the state, which are awarded based on their GPA (COECyT: State Council of Science and Technology, Coahuila;

http://www.coecyt-coah.gob.mx/206/1/51/126.cfm?ii=81&bid=4&tid=101&id=1648).

6. EVALUATION OF THE EFFECTIVENESS OF THE COURSES/ACADEMIC PROGRAM

Description of the standard: The Program Coordinator is responsible for conducting periodic evaluations of the effectiveness of the courses and the Program. He also has the responsibility to use the information from these assessments to strengthen/improve the Program.

Introduction

In 1971 the Universidad Autónoma Agraria Antonio Narro (UAAAN) diversified his unique career as an Agronomist in three careers; one of them Ingeniero Agrónomo Zootecnista (IAZ). Both the previous study plan and that of IAZ included subjects related to natural resource management and grasslands. In order to make more flexible the training of the learners, it was implemented in 2007 the last curricular restructuring of the career of IAZ (Actualización curricular 2007), which is currently being reviewed by the Departmental Academy for its updating. With the update three terminal profiles arise (major areas): Management and conservation of Natural Resources and Pastures, Animal Production and Animal Nutrition. The basic changes to the update were: decrease the number of courses (63 to 53), increase elective courses (5 to 11), balance 50%-50% theory and practice, inclusion of tutoring program and a professional practice semester.

Thus, in August 2007 the first students were enrolled in these terminal profiles, which graduated in December 2011. Under this context, the following paragraphs will present statistics from the IAZ Program, with the aim of illustrating the institutional tools to estimate the effectiveness of the courses and the emerging terminal profile in the Management and Conservation of Natural Resources and Pastures.

6.1. Curricular map

In Mexico there are two organizations related to the improvement of the quality of higher education: Inter-institutional Committees for the Evaluation of Higher Education (CIEES, http://www.ciees.edu.mx/ciees/inicio.php), Council for the Accreditation of Higher Education COPAES which is supported by the Mexican Committee for the Accreditation of Agronomic Education (COMEAA, http://www.comeaa.org/principal.html). The first one only evaluates and issues recommendations, the second through the COMEAA that is certified by the Federal government, via the Ministry of Public Education, for the accreditation of the undergraduate academic programs. The IAZ Program, with its three terminal profiles, was accredited by this instance in January 2018 (Constancia Acred COMEAA) and the respective self-assessment report which is available at: Informe autoevaluación 2017. The curricular structure recommended by the aforementioned organizations includes three stages of training: basic, disciplinary and terminal. Tables 7 and 8 show the distribution of credits per training stage.

Table 7. Distribution of credits by training stage

Training Stage of the Academic Program	Credits compulsory**	%	Credits optional**	%	Total	%
Basic	183	51	20-24	28	203-207	48
Disciplinarian	79	22	25-32	36	104-111	24
Terminal*	94-96	27	25-32	36	119-126	28
Total	356-358	100	70-88	100	426-444	100

* Includes 40 compulsory credits of professional practices.
**The equivalent credit is: 1 hr theory=2 Cr and 1 hr practices=1cr.

Table 8. Courses and credits by training stage

Training Stage of the Academic Program	Number of courses		Number of credits*	
	Compulsory (%).	Optional (%).	Compulsory (%).	Optional (%).
Basic	24 (5).	3 (28).	183 (51).	20-24 (28).
Disciplinarian	10 (24).	4 (36).	79 (22).	25-32 (36).
Terminal	8 (19).	4 (36).	94-96 (27).	25-32 (36).
Total	42 (100).	11 (100).	356-358 (100).	70-88 (100).

* The equivalent credit is: 1 hr theory=2 Cr and 1 hr practices=1cr.

In turn, the curricular balance suggested among the areas of knowledge is mentioned in table 9.

Table 9. Curricular balance suggested by CIEES among the areas of knowledge

Identification	Areas of Knowledge	Equilibrium Suggested by CIEES (%).	Equilibrium in MCRNP (%).
A	Exact and natural sciences	25	23.8
B	Exact, fundamental and natural sciences,	30	31.0
C	Exact applied Sciences and natural sciences	30	31.0
D	Social sciences and humanities	10	9.5
E	Other contents	5	4.7

Table 10 lists the half-yearly distribution of the areas of knowledge above.

Table 10. Half-yearly distribution of the areas of knowledge.

Semester	Area of knowledge					
	A	B	C	D	E	Total
1	4	1	0	0	1	**6**
2	2	2	0	1	1	**6**
3	2	4	0	0	0	**6**
4	2	1	1	2	0	**6**
5	0	3	2	0	0	**5**
6	0	1	3	1	0	**5**
7	0	0	4	0	0	**4**
8	0	0	1	0	0	**1**
9	0	1	1	1	0	**3**
Total	**10**	**13**	**12**	**5**	**2**	**42**
%	**23.8**	**31**	**28.6**	**11.9**	**4.7**	**100**

The connectivity between the courses of the curriculum is shown in the following link (Mapa curricula IAZ).

6.2. Teaching Assessment

To guarantee the fulfillment of the subjects of the courses, different actions are carried out: 1). There is a process of control of teacher attendance that carries out the Undergraduate Subdivision through the Prefecture Area; 2). The University Statute which designates as obligations, in Chapter 2, article 23: They are obligations of the academic staff of the university, in addition to those of labor character contained in the Federal labor law and in and in the collective contract, the following ones:

I. To respect the dispositions of the Constitutional law, of the present statute and of other regulations of the University, and to act in a coherent way with the mission of the institution.

II. To be present with punctuality and regularity at their activities, and to fulfill the assigned schedule.

III. To fulfill the activities according to their appointment and the inherent or assigned academic responsibilities related to their work, observing the dispositions issued for that purpose.

IV. To prepare, attend, develop and fulfill the programs, projects and academic activities that have been entrusted to them and the complementary ones assigned by the immediate supervisor.

V. Apply and concur to the academic evaluations of all kinds that are entrusted to them by the higher hierarchical authority of the dependency to which they are attached.

VI. Submit the documentation and information related to the academic evaluations in which they participate, within the deadlines set by the competent authority.

VII. Treat their students, the University authorities and other people of the University with respect and courtesy.

VIII. Perform the academic commissions assigned by the authorities of the University or their affiliation unit.

IX Attend work meetings convened by the authorities of the University or the unit they are attached.

X. Provide the academic advising entrusted by the immediate superior.

XI. Permanently be better in the academic and professional field, through courses, academic activities and established programs that are offered to promote better compliance of the tasks entrusted.

XII. Provide in a timely manner the documentation and information that proves their preparation and capacity, for the integration of their file.

XIII. Give credit to the University in the publications derived from the work done in it, or in commissions entrusted by the University authority.

XIV. Refrain from conducting acts of proselytizing in favor of any political or religious group in the University.

XV Fulfill the resolutions of the University governing bodies.

XVI. Compensate the damages and losses caused to the university patrimony when responsible, in case the competent authority determines it.

XVII. To inform the immediate superior authority and, if applicable, the other authorities of the University, of the actions, omissions or abstentions of their students that are considered as faults or causes of responsibility, in accordance with the provisions of this regulation and in the other applicable legal provisions.

XVIII. Prevent and take the corresponding safety measures for the development of academic activities under their charge.

XIX Observe a decorous behavior in the institution and in the external entrusted academic activities, for the fulfillment of their responsibilities.

XX. Others established by the University and applicable regulations. Estatuto Universitario.

Teacher evaluations are carried out by the Educational Training and Research Department through the Proceso de Evaluación Docente. Los resultados de la evaluación. The results of the evaluation are given to each teacher and every academic department also receives a concentrated result report of all the teachers who have been assigned to it, as well as the support teachers.

6.3. Qualitative summary of annual exit interview with seniors.

These consultations (student perception on the strengths and weaknesses of the Program and postgraduate activities) have not been implemented; however, we are convinced that they must be incorporated into the IAZ Program Development and Continuous Improvement Program.

There have been consultations with the students to know their degree of satisfaction in various aspects that will serve to join the Development Plan and Continuous Improvement Program of the IAZ career.

6.4. Results of surveys to students at different stages of their career

As mentioned in subsection 6.2, students are consulted annually. In recent years (2016 and 2017). The evaluation of the tutor is included in the teacher evaluation, however, the aspects suggested by the SRM (feedback on tutoring and counseling, the appropriateness of the sequencing of courses and development of skills) are not included. The Program has applied surveys to students to know their degree of satisfaction in various aspects that impact their student life such as: performance of authorities and administrative staff, performance in educational aspects (teaching of courses, internships, etc.) and others. This is applied in the semester January-June to all semesters of the IAZ career (formato encuesta, encuestas, resultados,). However, since it has been indicated within the COMEAA accreditation results, they have been integrated into the objectives and strategies as an addendum to the 2013-2018 PDI.

6.5. Results of surveys to graduates

The area of Graduates of the Undergraduate Sub direction of the Teaching Direction is responsible for the implementation of a program to monitor graduates, and in an initial stage it has included within the institutional website, a section where graduates can register with the intention to maintain communication with the University http://www.uaaan.mx/egresados/; this record contains essential information such as graduation date, degree, form of certification, and if they are working in the area of their your knowledge, among others (Registro de egresados).

6.6. Results of employer surveys

Currently, there is afollow-up of the professional activities carried out by students during their semester of professional practices with public or private institutions, which serve to consult among potential employers the professional performance of graduates. This activity is done through the professors of the subject of professional practices (Encuesta a empleadores).

6.7. Mechanism of feedback and integration of information to the operation of the Program

By organizational structure in the University, the planning, monitoring and evaluation of academic and administrative activities correspond to the Planning and Evaluation Unit and the Academic General Direction. The University has a General Organization Manual Manual General de Organización 1995 in which the functions of each instance are described and it is the Planning and Evaluation Unit, structured by a direction and four sub-directions (Sub-direction of: Institutional Planning and Development, Programming and Budget, Computing and Telecommunications and Institutional Evaluation and Effectiveness), responsible entities for planning the substantive and adjective activities which function is to plan, organize, lead and evaluate the University activities necessary for the design of the institutional development plan, proposing policies and strategies for the fulfillment of the objectives of the University, through an integral process that contemplates the strategic, budgetary and physical planning, as well as the organizational development, the institutional evaluation and the information system for the decision making of the higher authorities.

The UAAAN, as an entity coordinated by the SEP, must attend the technical administrative procedures, in accordance with the objectives, strategies and lines of action of the education sector program,

from which it receives resources through budgetary programs. It should be noted that the main source is the allocation decreed in the Budget of Expenditures of the Federation (PEF), same that is notified to the rector via oficio de la SEP and the University authorities should focus on complying with the calendar and guidelines established in the budget, which is structured with the contributions from the federal government, state governments, educational services and income from special projects; to achieve an effective management of resources, as well as to explore diverse sources of financing; however, it is the responsibility of all university students and professors to improve their performance in order to increase the indicators of efficiency, effectiveness, economy and quality.

In the field of systematization of its Academic-Administrative functions and because of the evaluations of accreditation bodies, the Institution has made progress in this regard. It should be noted that today there is the Sistema Integral de Información Académico Administrativa (SIIAA http://siiaa.uaaan.mx/) which has managed to integrate academic and administrative processes that facilitate the handling of information and systematization for decision making in a timely manner. Regarding the administrative processes, it has: Budgets, Control and warehouse, Advances and payments, Accounting, Fixed assets, Payroll, Delivery reception and a support system, through all this the operational planning of the corresponding budgets in each area is carried out. In relation to the academic processes they integrate: Bachelor's School Control, Graduate School Control, Tutoring, Teaching Evaluation, PEDPD, Agricultural Practices and Administration of teaching programs.

Likewise, the Project of Programa Anual de Metas y Presupuesto and the Sistema de Presupuestos is the procedure that supports the planning and distribution of the corresponding resources based on the objectives, strategies and lines of action of the PDI 2013-2018, derived from this framework, the annual goals are planned and resources per executing unit and project are assigned

6.8. Description of student recruitment activities

The University has a Manual para el Proceso de Selección e Ingreso de Estudiantes where the opening of the call is announced, the exam preparation guide, mechanisms and instruments that guarantee its transparency, procedures and feedback mechanisms with secondary education institutions, as well as the entry profile. There is also an induction process for new students that is described in the Manual para el Proceso de Inducción. Table 11 shows the behavior of the demand for admission to the IAZ Academic Program in recent years.

Table 11. Behavior of the demand for admission to the IAZ Academic Program.

Year	Applications	Admitted	Registered
2012	154	134	129
2013	184	143	122
2014	226	193	122
2015	246	123	126
2016	252	206	116
2017	276	241	125

6.9. Description of the academic standards of admission, retention and graduation of the Program

Admission academic standards

Diagnoses of:

a) Socioeconomic level

b) Sufficiency in knowledge in the basic areas such as: mathematics, biology, physics, chemistry and social sciences

c) Reading comprehension skills

Every year, the National Center of Evaluation for Higher Education (CENEVAL), an external body that performs the evaluation of applicants to the careers offered, sends the data to the University, specifically to the Educational Development Sub-Direction, of the Context Questionnaire that consist of specific information of the applicants that they provided at the time they registered for the EXANI II. This information contains socio-economic aspects, the resultados de los exámenes de Admisión in the areas of Mathematical Thinking, Analitical Thinking, Language Structure and Reading Comprehension as well as the resultados del examen de Diagnóstico in which the results referring to the Agricultural Sciences Module are provided with the disciplinary areas of Biology, Mathematics, Written Language and English. The Sub-Direction of Educational Development develops a report with the Results of the Selection Exam.

Schools of origin

Regarding the schools of origin this data was included in the context questionnaire in the application for the EXANI II until 2015. In 2016, the University requests them from the students at the time of registration. The University has information about the previous school and the state of origin of every new student. This information is available in Informe de Escuelas de Procedencia.. Table 12 shows the number of new students entering the IAZ Academic Program (2012-2017).

Table 12. Number of new students entering the Academic Program of Ingeniero Agrónomo Zootecnista (2012-2017).

Year	Registered students
2012	129
2013	122
2014	122
2015	126
2016	116
2017	125

Permanence

The academic programs of the institution including the IAZ Program are governed by the Reglamento Académico para Alumnos de Licenciatura which establishes in its Chapter VIII "On evaluation, accreditation and promotion" the mechanisms by which a student can be evaluated, accredited and promoted. Table 13 shows the PAIAZ retention rate for the first year of the last five cohorts.

Table 13. PAIAZ student retention percentage in the first year of the last five cohorts.

Cohort	Registered students	Number of students after the first year	Percentage of retention after the first year
2009-2013	117	81	69
2010-2014	115	89	77
2011-2015	12	91	75
2012-2016	129	101	78
2013-2017	122	85	70

Degree

The aforementioned Reglamento Académico para Alumnos de Licenciatura clearly states the requirements and forms of obtaining the degree which are: Thesis, Work Reports, Courses of option to degree (two at graduate level), Elaborate a Monograph, Prepare an Observation Work (Descriptive research), Pass the EGEL CENEVAL exam, and get a General Average of 9.5 or higher.

In all degree options, a Professional Examination must be presented to a jury, integrating the knowledge acquired in the support courses of the general education area that includes oral and written communication, science and mathematics, social sciences and humanities, computer science, as well as those in the professional education area. Table 14 shows data from the last four generational cohorts, the percentage of degree that exceeds 65%.

Table 14. Percentage of IAZ Program titration of the last four cohorts.

Cohort	Alumni	Graduated	Percentage with the degree
2009-2013	61	43	70
2010-2014	59	47	84
2011-2015	52	32	65
2012-2016	51	11	23
2013-2017	*44	*23	*52

* 2013 generation in process of completion. Source: Own elaboration with data from the SIIAA.

In relation to the options for graduation of IAZ Program students, table 15 shows that in the last years the highest percentage is by thesis, followed by the courses of option to degree, research works and monographs.

Table 15. Proportion of graduated students of the IAZ Program / degree option.

	Cohortes generacionales									
Opción	2009-2014	%	2010-2015	%	2011-2016	%	2012-2017	%	2013-2017	%
Cursos de postgrado	13	30	22	47	16	50	4	37	8	35
Monografía	5	11	6	12	5	15	0	0	4	17
Tesis	25	58	19	40	11	34	7	63	10	44
Trabajo de investigación descriptiva	0	0	0	0	0	0	0	0	1	4
Total	**43**	**100**	**47**	**100**	**32**	**10**	**11**	**100**	**23**	**100**

6.10. Summary of student progress patterns through the program

The University has an Integral System of Academic and Administrative Information (SIIAA), where the School Control Department is responsible of concentrating all the files of the students of the Academic Programs, including the trajectory of the students from admission to departure, considering the generational cohorts with information from:

a). Terminal efficiency
b). Average duration of studies
c). Retention percentage
d). Index of lag by school year
e). Approval index
f). Dropout rate
g). Percentage of performance
h). Average grade for each of the subjects
i). Subjects with higher failure rate. (http://administrativo.uaaan.mx/escolar/menuR.php).

In relation to the IAZ Program, information derived from the SIIAA is as follows

Terminal efficiency.

Table 16 shows the terminal efficiency of the PAIA, which is located between 40 to 52 percent.

Cuadro 16. Eficiencia terminal del Programa IAZ de las últimas cuatro cohortes.

Cohorte-generacional	Alumnos de nuevo ingreso	Egresados	Eficiencia terminal (%)
2009-2013	117	61	52
2010-2014	115	59	41
2011-2015	121	52	43
2012-2016	129	51	40
2013-2017	122	44	36

Fuente: Elaboración propia con datos del SIIAA

Number of years it takes to students for graduate.

The average duration in semesters for students of the IAZ Program can graduate is described in table 17, considering that the career is designed to be covered in 9 semesters.

Table 17. Average number of semesters for students to graduate from the IAZ Program.

Cohort	Average of semesters to finish the academic program
2009-2013	9.40
2010-2014	8.81
2011-2015	9.19
2012-2016	9.19
2013-2017	8.90

Source: Self-elaboration with SIIAA data

Percentage of retention in the first year.

Table 18 shows that for the IAZ Program the percentage of retention in the first year after their entry exceeds the 69%.

Table 18. Percentage of retention of PAIAZ the first year of the last five cohorts

Cohort	Registered students	Number of students after the first year	Percentage of retention after the first year
2009-2013	117	81	69
2010-2014	115	89	77
2011-2015	12	91	75
2012-2016	129	101	78
2013-2017	122	85	70

Source: Self-elaboration with SIIAA data

Rate of lag per school year.

They are considered straggling students, those who end the school year with at least one failed subject. The lag rates for the last 4 school years are shown in table 19.

Table 19. Percentage of lag per school year of students from the IAZ program

Semester	Registered students	Students that fail in at least a subject	% of lag
Enero - Junio de 2015	355	69	19
Agosto - Diciembre de 2015	429	45	10
Enero - Junio de 2016	372	110	30
Agosto - Diciembre de 2016	446	153	34
Enero – Junio de 2017	374	121	32
Agosto – Diciembre de 2017	474	83	18

Source: Self-elaboration with SIIAA data

Approval rating

Table 20 shows an example of the approval rating of the students of the IAZ Program, the January-June 2017 results obtained in every subject. In the SIIAA you can access the information of the cycles August 2007 to August 2017.

Table 20. Student approval rating of the IAZ Program in the school term January - June 2017

Key	Subject	Total	Ordinary	Extra	Total
SADM403	Administración I	94	65	21	91
SADM430	Mercadotecnia	61	53	3	92
SADM459	Formulación y evaluación de proyectos	26	18	3	81
SADM460	Agronegocios	38	36	0	95
SAGM410	Climatología y meteorología	8	6	1	88
SBOT403	Biología molecular	3	2	0	67
SBOT405	Botánica general	6	2	3	83
SBOT422	Ecología general	21	18	2	96
SBOT424	Fisiología vegetal	14	9	1	71
SCSB401	Física	1	1	0	100

Key	Subject	Total	Ordinary	Extra	Total
SCSB408	Topografía	98	82	10	94
SCSB413	Química orgánica	10	8	0	80
SCSB421	Bioquímica	80	62	2	81
SDEC405	Cálculo diferencial e integral	2	2	0	100
SDEC410	Matemáticas	40	17	18	88
SDEC425	Estadística	11	7	0	64
SDEC430	Diseños experimentales	87	80	1	93
SDEC448	Computación	9	8	0	89
SDEC453	Tecnologías de la información y la comunicación	4	3	0	75
SDEP410	Deportes	7	7	0	100
SDUI401	Inglés i	27	20	3	85
SDUI402	Inglés ii	54	31	14	83
SECA403	Economía agrícola pecuaria	95	75	10	90
SECA404	Análisis del sector agropecuario de México	9	7	1	89
SFIT401	Genética	33	28	2	91
SFIT450	Producción de cultivos básicos	11	9	2	100
SFIT472	Biotecnología	18	18	0	100
SFIT477	Producción en invernadero	1	1	0	100
SHOR426	Propagación de plantas	5	5	0	100
SMAQ412	Maquinaria y equipo agropecuario	96	80	3	86
SNUA401	Principios de nutrición animal	63	58	2	95
SNUA421	Nutrición animal	51	38	10	95
SNUA426	Alimentos y alimentación animal	6	4	1	84
SNUA440	Análisis de productos pecuarios	12	12	0	100
SNUA446	Análisis de nutrientes y alimentos funcionales	8	8	0	100
SNUA475	Nutrición de rumiantes en agostadero	25	24	1	100
SNUA479	Nutrición y alimentación porcina	1	1	0	100
SNUA484	Nutrición y alimentación en acuacultura	1	1	0	100
SPAR420	Microbiología agropecuaria	1	1	0	100
SPAR485	Fitopatología	2	1	1	100

Key	Subject	Total	Ordinary	Extra	Total
SPAR499	Agricultura orgánica	3	3	0	100
SPRA406	Anatomía y fisiología de los animales domésticos	87	57	14	82
SPRA407	Genética y mejoramiento animal	37	32	0	86
SPRA411	Fisiología de la reproducción	31	10	14	77
SPRA413	Calificación y exterior de ganado	26	20	6	100
SPRA415	Introducción a la zootecnia	9	3	5	89
SPRA422	Enfermedades del ganado	8	8	0	100
SPRA437	Industrialización de productos pecuarios	53	33	9	79
SPRA441	Bovinocultura de carne	22	16	6	100
SPRA444	Producción de carne y leche en el trópico	5	5	0	100
SPRA446	Povinocultura de leche	38	38	0	100
SPRA450	Avicultura	61	61	0	100
SPRA452	Aves de combate	30	29	0	97
SPRA457	Porcicultura	34	26	6	94
SPRA460	Seminario de proyectos agropecuarios	2	2	0	100
SPRA463	Ovinocaprinocultura	35	23	10	95
SPRA469	Equinocultura	22	16	4	91
SPRA471	Cunicultura y especies menores	19	16	3	100
SPRA489	Prácticas profesionales	1	1	0	100
SPRA499	Ética profesional y valores	63	60	3	100
SRNR404	Plantas de pastizales	8	4	3	88
SRNR406	Ecología de recursos naturales renovables	36	18	9	75
SRNR421	Manejo de pastizales	27	15	6	78
SRNR422	Manejo sustentable de los suelos del pastizal	2	2	0	100
SRNR431	Fauna silvestre	29	29	0	100
SRNR439	Percepción remota	16	16	0	100
SRNR453	Administración holística de recursos	4	3	1	100
SRNR461	Gestión estratégica sustentable de empresas ganaderas	4	4	0	100
SRNR463	Hidrología de pastizales	9	9	0	100
SRNR470	Rehabilitación de pastizales	5	5	0	100

Key	Subject	Total	Ordinary	Extra	Total
SRNR472	Producción y conservación de forrajes	50	23	20	86
SRNR481	Manejo y ordenamiento de cuencas	9	9	0	100
SRNR485	Educación ambiental	19	17	0	89
SRYD421	Hidráulica	27	24	1	93
SRYD423	Relación agua-suelo-planta-atmósfera	5	2	3	100
SRYD472	Taller de sistemas de riego	81	57	21	96
SSOC405	Taller de comunicación oral y escrita	70	56	2	83
SSOC416	Políticas públicas para el desarrollo rural	9	9	0	100
SSUE403	Introducción a la ciencia del suelo	7	7	0	100
SSUE405	Edafología	4	2	1	75
SSUE420	Fertilidad y fertilización de suelos	17	8	9	100
SSUE440	Metodología de la investigación	40	40	0	100
SUAI401	Inglés i	1	0	1	100
SUAI410	Inglés ii	9	8	1	100
SUAI421	Inglés iii	6	5	0	83

Source: Self-elaboration with SIIAA data

Dropout rate

Table 21 shows the number of students who left the IAZ program in the last four generational cohorts.

Table 21. Proportion of students of the IAZ program who failed their studies

Cohort	Total	Number of students that abandon the studies	% drop out
2009-2014	117	56	47
2010-2015	115	56	48
2011-2016	121	69	17
2012-2017	129	67	51
2013-2017	122	51	41*

* Generation that has not yet completed its period according to the bachelor's degree.
Source: Own elaboration with SIIAA data

Performance Rate

Table 22 shows the results of the last four school terms of the students of the IAZ Program who approve at least one subject with minimum grade.

Table 22. Students of the IAZ Program that approve at least a subject with minimum grade.

Semester	Registered students	Number of students that approves at least a subject with minimum grade	% of students with a least a subject with the minimum grade
Enero - Junio de 2015	355	176	50
Agosto - Diciembre de 2015	429	65	15
Enero - Junio de 2016	372	175	47
Agosto - Diciembre de 2016	446	126	28
Enero – Junio de 2017	374	67	18
Agosto – Diciembre de 2017	474	99	20

Source: Own elaboration with SIIAA data

Average grades of the subjects.

Table 23 shows the average grades per subject, obtained by the generational cohorts 2013-2017 of the IAZ Program.

Table 23. Average grades of the 2013-2017 generational cohort of the IAZ program. (compulsory subjects only).

Key	Subject	Average Grade
SADM403	Administración I	73.3
SADM430	Mercadotecnia	76.7
SADM459	Formulación y evaluación de proyectos	81.3
SADM460	Agronegocios	90
SAGM410	Climatología y meteorología	54.8
SBOT405	Botánica general	58.1
SBOT424	Fisiología vegetal	77.5
SCSB408	Topografía	78.1
SCSB413	Química orgánica	59.2
SCSB421	Bioquímica	55.9

Key	Subject	Average Grade
SDEC410	Matemáticas	47.9
SDEC425	Estadística	82.7
SDEC430	Diseños experimentales	81.9
SDEC448	Computación	83.3
SECA403	Economía agrícola pecuaria	72.6
SFIT401	Genética	88
SMAQ412	Maquinaria y equipo agropecuario	71.6
SNUA401	Principios de nutrición animal	89.4
SNUA421	Nutrición animal	76
SNUA489	Prácticas profesionales	101
SPAR420	Microbiología agropecuaria	76.3
SPRA406	Anatomía y fisiología de los animales domésticos	64
SPRA407	Genética y mejoramiento animal	80
SPRA411	Fisiología de la reproducción	67.5
SPRA415	Introducción a la zootecnia	69.6
SPRA422	Enfermedades del ganado	83.1
SPRA437	Industrialización de productos pecuarios	76.7
SPRA441	Bovinocultura de carne	75.5
SPRA446	Bovinocultura de leche	80
SPRA450	Avicultura	85.3
SPRA457	Porcicultura	77.5
SPRA463	Ovinocaprinocultura	74.7
SPRA489	Prácticas profesionales	101
SPRA499	Ética profesional y valores	90.6
SRNR406	Ecología de recursos naturales renovables	81
SRNR421	Manejo de pastizales	80.6
SRNR431	Fauna silvestre	86.8
SRNR450	Impacto ambiental	92.5
SRNR453	Administración holística de recursos	78.8
SRNR467	Inventario y evaluación de pastizales	79.7
SRNR470	Rehabilitación de pastizales	87
SRNR472	Producción y conservación de forrajes	74.3

Key	Subject	Average Grade
SRNR489	Prácticas profesionales	101
SRYD426	Uso y manejo del agua	70.3
SRYD472	Taller de sistemas de riego	76.1
SSOC405	Taller de comunicación oral y escrita	90
SSUE420	Fertilidad y fertilización de suelos	61.9
SUAI401	Inglés I	93.8

Subjects with higher failure rate.

With information available in the SIIAA, the index for each cohort can be calculated from 2007, for example, in table 24, the 20 subjects with the highest failure rate of the IAZ Program obtained by the generational cohort 2013-2017 are listed.

Table 24. Students enrolled and percentage of failure of the subjects with the highest failure rate of the IAZ Program.

Key	Subject	Total students	% of failure
SDEC410	Matemáticas	156	30
SAGM410	Climatología y meteorología	150	28
SBOT405	Botánica general	142	27
SRNR406	Ecología de recursos naturales renovables	120	30
SCSB421	Bioquímica	128	25
SCSB413	Química orgánica	138	22
SPRA407	Genética y mejoramiento animal	104	29
SRNR421	Manejo de pastizales	90	31
SNUA401	Principios de nutrición animal	105	26
SSUE420	Fertilidad y fertilización de suelos	111	21
SPRA411	Fisiología de la reproducción	91	23
SPRA406	Anatomía y fisiología de los animales domésticos	101	20
SFIT401	Genética	108	16
SPRA415	Introducción a la zootecnia	128	13
SECA403	Economía agrícola pecuaria	107	15
SRYD426	Uso y manejo del agua	107	14
SRNR472	Producción y conservación de forrajes	87	16
SMAQ412	Maquinaria y equipo agropecuario	110	12
SPRA422	Enfermedades del ganado	76	17
SBOT424	Fisiología vegetal	98	14

Source: Own elaboration with data from the SIIAA.

6.11. Summary of the analysis of the students' academic records.

Figure 6 shows that the analysis derived from the average grade obtained at the departure of the IAZ students for each of their terminal profiles shows that the terminal profile of NRRMP does not represent significant differences with respect to the Nutrition and Animal Production profiles.

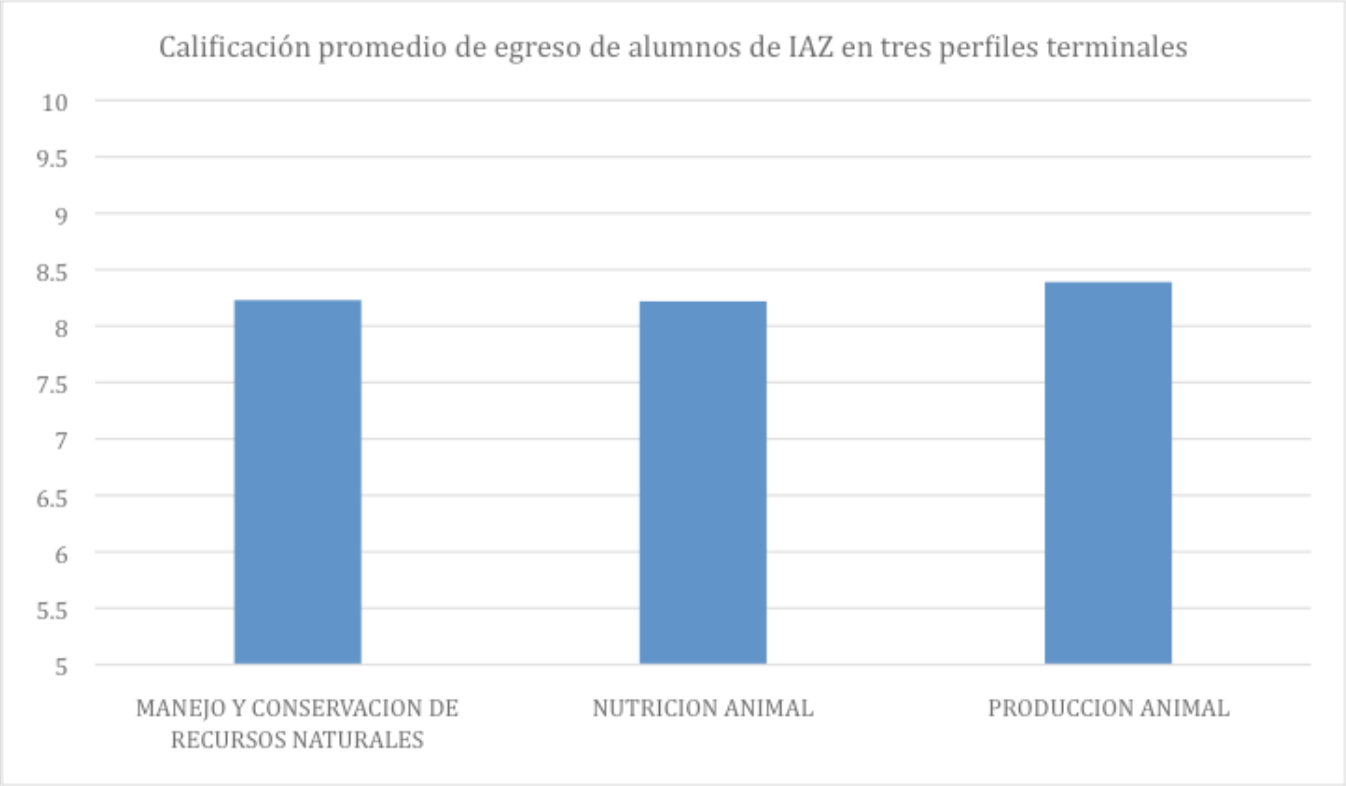


Figure 6. Average graduation rate of the terminal profiles of the IAZ Program.

6.12. Identification and evaluation of the relative importance of the sources of ideas for the progress of the Program

The departmental academies are sources where ideas and actions are expressed and help to improve the Program. The Program Academy is also a very important source of ideas that are taken into account for the progress of the Program.

Employer surveys are a source that contributes initiatives and proposals that are analyzed and evaluated to be considered.

6.13. Total enrollment and by Program cohort

Table 25 shows the students enrolled in the January - June 2018 cycle by generational cohort.

Table 25. Students enrolled in the semester January - June 2018 by generational cohort.

Year	students	Registered in the semester January- June 2018
2007*	118	1
2010*	115	3
2011*	121	2
2012*	129	7
2013	122	27
2014	122	73
2015	123	86
2016	116	85
2017	126	109

* Note: Students who enrolled 2007-2012 lag of the generation.

6.14. Number of graduates of the program during the last five years.

Table 26 shows the terminal efficiency rate of the IAZ students of the last five years

Table 26. Terminal efficiency rate of the IAZ students of the last five years.

Cohort	Number of students	Ex alumni	Terminal efficiency (%)
2009-2013	117	61	52
2010-2014	115	59	41
2011-2015	121	52	43
2012-2016	129	51	40
2013-2017	122	44	36

6.15. Summary of jobs of recent graduates of the Program

Many of the students of the Program are hired by the receiving entities where they carried out their professional practices, which means a strength for the Program (entidades receptoras).

6.16. Information of students in other areas studying subjects of the Program

Almost every semester, students of the programs of Forestry Engineer, Environmental Agricultural Engineer, Agrobiology Engineer, Production Engineer and Agricultural Machinery take courses of the IAZ Program.

7. IDENTITY AND FINANCING OF THE UNIVERSITY

7.1. Institutional incorporation to national accreditation bodies

The accreditation body for higher agricultural education institutions in Mexico is the Mexican Committee for the Accreditation of Agricultural Education (COMEAA, http://www.comeaa.org/). The IAZ career was accredited on January 23, 2018 for a period of five years (Constancia Acred COMEAA).

7.2. Institutional capacity to offer higher education

7.2.1. Library services

I.- Facilities.

The Information and Documentation Center (CID) is in the University within the "Dr. Egidio G. Rebonato " library which covers the needs of users involved in forestry and agricultural science, as described below:

a) Adequate furniture, lighting, ventilation and temperature, as well as special adaptations for people with different capacities.

b) Open shelving and appropriate facilities with sufficient reading and research spaces to simultaneously accommodate at least 10% of the student of the University.

The library has an open bookcase, allowing users direct access to collections of general consultation, consulting the automated catalog to locate them quickly through the computer equipment installed in the different sections.

It has 7 rooms, 4 to consult books, arranged according to the classification of the Library of the Congress of the United States of America, a newspaper library area, which has sufficient equipment and furniture for electronic consultation, a thesis room with printed material and the institutional repository of electronic theses.

In addition, it has 462 available seats, 12 cubicles for study, 2 photocopiers, reception and loan section of bibliographic material, as well as a lobby for exhibitions.

It is distinguished by the National Institute of Statistics and Informatics (INEGI) by being the repository of the physical and electronic heritage generated by the INEGI http://www.inegi.org.mx/ (maps, aerial photographs, censuses, statistics and manuals)

II.- Services and collection of the Library.

The collection of the library in terms of quantity, quality and accessibility, are adjusted to the needs of the Academic Program (recommended basic bibliography and its availability). The bibliographical collection includes 130,094 documents. http://biblioteca.uaaan.mx/

The library has more than one volume for each book, which are in good condition and thereby meet the bibliographic needs of the academic programs of the UAAAN for the consultation of students and teachers staff. In addition, there is access to the UAAAN library page mentioned above. It has agreements with the following digital agricultural libraries: REMBA http://remba.uaa.mx agreements and SIDALC http://orton.catie.ac.cr/

Table 27. Number of titles and volumes in the CID.

	Titles	Volumes
Books	25.097	46.478
Thesis	11,995	20,559
Thesis (electronic files)	7,000	7,000
Thesis (microfiche)	14,698	14,698
Scientific papers	676	14,185
Official publications	2,555	8,208
Maps	7,989	11,000
Aerial photography	7,283	7,283
Manual	683	683

a) The forms to access the information contained in the library and electronic document collections.

Navigation by shelf (access to a virtual browsing experience through the shelves through its classification and allows users to see other books that may be related to their search, placed on the shelves near the title they are observing.

Online services can be accessed using the following links: http://biblioteca.uaaan.mx/, cid@uaaan.mx

DSpace

The institutional repository (CID-UAAAN) was created at the University to host, disseminate and preserve digital documents resulting from research and teaching activities

http://repositorio.uaaan.mx:8080/xmlui/

b). The sufficiency of: i) Qualified human resources; ii) A minimum of ten well-selected titles (quality and updated) for each subject that integrates the curriculum of the Academic Program. iii) A minimum of ten subscriptions to periodicals of the basic disciplines of the Academic Program. iv) A collection of useful reference works and formed by a minimum of 300 different titles. v) Registration, statistics and interpretation of demand and availability; vi) Access and consultation systems; vii) Internet access; viii) Photocopy ix) Hours of service; x) Volume of consultation and loan to teachers and students.

The sufficiency of:

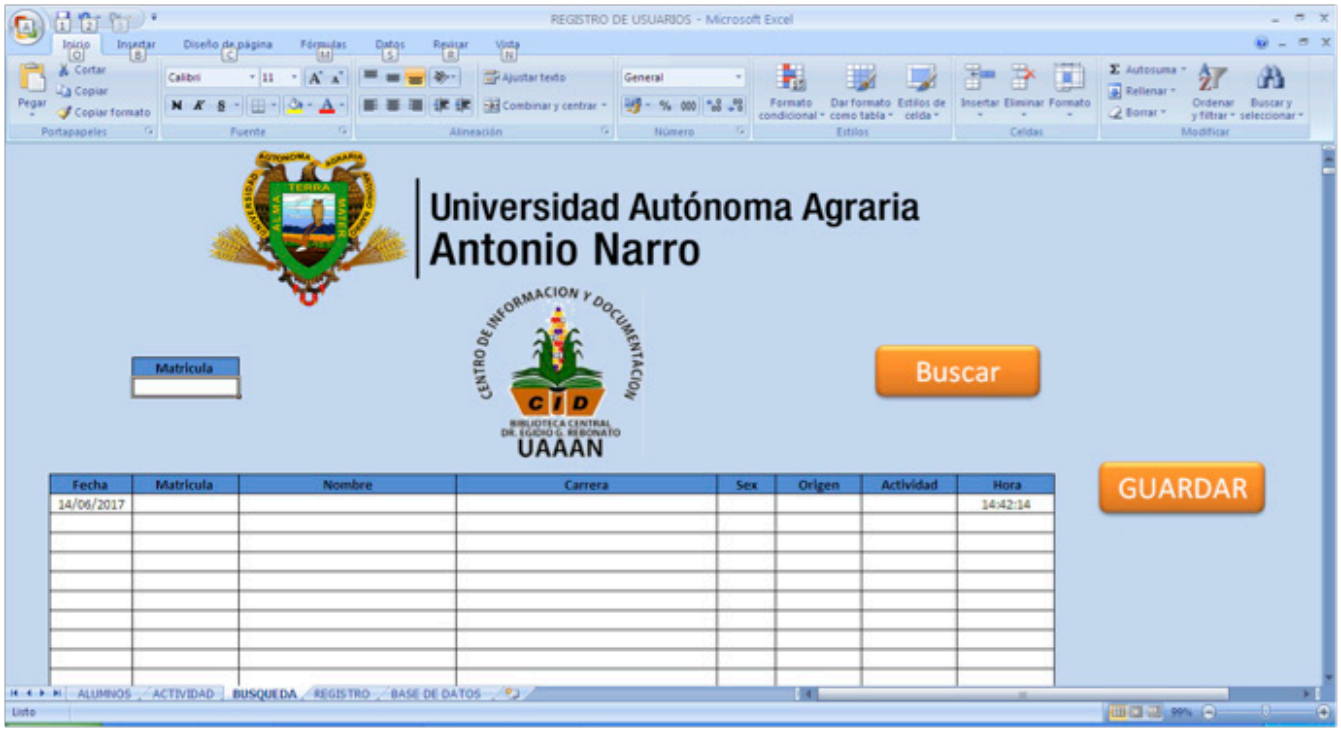
i). Qualified human resources: 7 Specialized Librarians, one lecturer, 12 library assistants and 6 administrative assistants

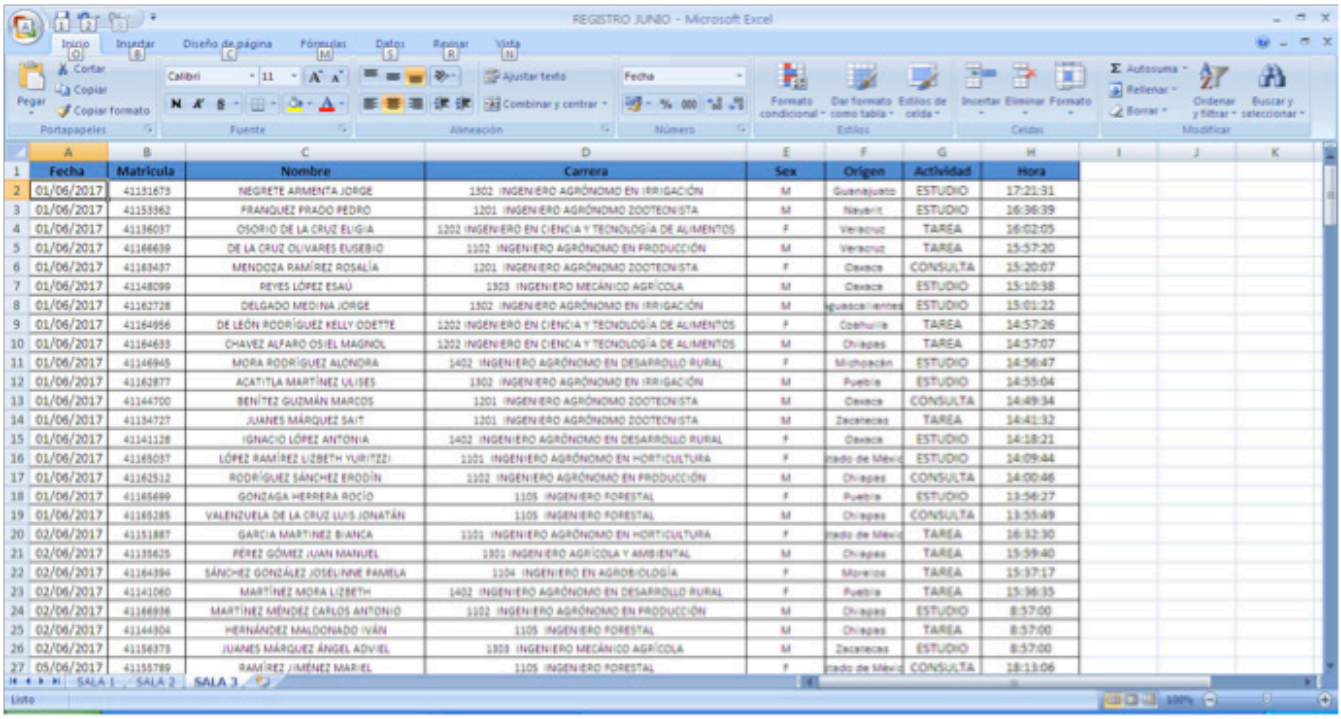
ii). Link with data banks, at least the most common and important in the Academic Program. The UAAAN is part of the Scientific and Technological Information Resources Consortium (CONRICYT), which purpose is to strengthen graduate programs, the generation of new knowledge and the development of research in Mexico http://www.conricyt.mx. With subscription to nine databases through annual agreement, which are: ELSEVIER, American Association for the Advance of Science (AAAs). , American Chemical Society (ACS), Annual Reviews, BioOne, EBSCO, GALE, Springer , Thomson Reuters

iii). The library has a section of reference works, which is formed by encyclopedias, dictionaries, atlases and manuals, thus complying with the number of established volumes.

iv). The library created an electronic program which is available in each of the rooms of it, for the user to access, it is necessary to enter his student number, the program provides the statistical data of use of each section including the specialty, it began to operate on 05/01/2017. Figure 7 shows the user registration in the information and documentation center.

In the past, the basic statistic consisted of the registration of users who only requested external loan of books and an internal registration in rooms.





Fecha	Matrícula	Nombre	Carrera	Sex	Origen	Actividad	Hora
01/06/2017	41131673	NEGRETE ARMENTA JORGE	1302 INGENIERO AGRÓNOMO EN IRRIGACIÓN	M	Guanajuato	ESTUDIO	17:21:31
01/06/2017	41153362	FRANQUEZ PRADO PEDRO	1201 INGENIERO AGRÓNOMO ZOOTECNISTA	M	Nayarit	ESTUDIO	16:36:39
01/06/2017	41136037	OSORIO DE LA CRUZ ELIGIA	1202 INGENIERO EN CIENCIA Y TECNOLOGÍA DE ALIMENTOS	F	Veracruz	TAREA	16:02:05
01/06/2017	41166639	DE LA CRUZ OLIVARES EUSEBIO	1102 INGENIERO AGRÓNOMO EN PRODUCCIÓN	M	Veracruz	TAREA	15:57:20
01/06/2017	41163487	MENDOZA RAMÍREZ ROSALÍA	1201 INGENIERO AGRÓNOMO ZOOTECNISTA	F	Oaxaca	CONSULTA	15:20:07
01/06/2017	41148099	REYES LÓPEZ ESAÚ	1303 INGENIERO MECÁNICO AGRÍCOLA	M	Oaxaca	ESTUDIO	15:10:38
01/06/2017	41162728	DELGADO MEDINA JORGE	1302 INGENIERO AGRÓNOMO EN IRRIGACIÓN	M	Aguascalientes	ESTUDIO	15:01:22
01/06/2017	41164956	DE LEÓN RODRÍGUEZ KELLY ODETTE	1202 INGENIERO EN CIENCIA Y TECNOLOGÍA DE ALIMENTOS	F	Coahuila	TAREA	14:57:26
01/06/2017	41164633	CHAVEZ ALFARO OSIEL MAGNOL	1202 INGENIERO EN CIENCIA Y TECNOLOGÍA DE ALIMENTOS	M	Chiapas	TAREA	14:57:07
01/06/2017	41146945	MORA RODRÍGUEZ ALONDRA	1402 INGENIERO AGRÓNOMO EN DESARROLLO RURAL	F	Michoacán	ESTUDIO	14:56:47
01/06/2017	41162877	ACATITLA MARTÍNEZ ULISES	1302 INGENIERO AGRÓNOMO EN IRRIGACIÓN	M	Puebla	ESTUDIO	14:55:04
01/06/2017	41144700	BENÍTEZ GUZMÁN MARCOS	1201 INGENIERO AGRÓNOMO ZOOTECNISTA	M	Oaxaca	CONSULTA	14:49:34
01/06/2017	41134727	JUANES MÁRQUEZ SAIT	1201 INGENIERO AGRÓNOMO ZOOTECNISTA	M	Zacatecas	TAREA	14:41:32
01/06/2017	41141128	IGNACIO LÓPEZ ANTONIA	1402 INGENIERO AGRÓNOMO EN DESARROLLO RURAL	F	Oaxaca	ESTUDIO	14:18:21
01/06/2017	41165037	LÓPEZ RAMÍREZ LIZBETH YURITZEI	1101 INGENIERO AGRÓNOMO EN HORTICULTURA	F	Estado de México	ESTUDIO	14:09:44
01/06/2017	41162512	RODRÍGUEZ SÁNCHEZ ERODÍN	1102 INGENIERO AGRÓNOMO EN PRODUCCIÓN	M	Chiapas	CONSULTA	14:00:46
01/06/2017	41165699	GONZAGA HERRERA ROCÍO	1105 INGENIERO FORESTAL	F	Puebla	ESTUDIO	13:56:27
01/06/2017	41165285	VALENZUELA DE LA CRUZ LUIS JONATÁN	1105 INGENIERO FORESTAL	M	Chiapas	CONSULTA	13:55:49
02/06/2017	41151887	GARCIA MARTINEZ BIANCA	1101 INGENIERO AGRÓNOMO EN HORTICULTURA	F	Estado de México	TAREA	16:32:30
02/06/2017	41135625	PÉREZ GÓMEZ JUAN MANUEL	1901 INGENIERO AGRÍCOLA Y AMBIENTAL	M	Chiapas	TAREA	15:59:40
02/06/2017	41164394	SÁNCHEZ GONZÁLEZ JOSELINNE PAMELA	1104 INGENIERO EN AGROBIOLOGÍA	F	Morelos	TAREA	15:37:17
02/06/2017	41141060	MARTÍNEZ MORA LIZBETH	1402 INGENIERO AGRÓNOMO EN DESARROLLO RURAL	F	Puebla	TAREA	15:36:35
02/06/2017	41166936	MARTÍNEZ MÉNDEZ CARLOS ANTONIO	1102 INGENIERO AGRÓNOMO EN PRODUCCIÓN	M	Chiapas	ESTUDIO	8:57:00
02/06/2017	41144304	HERNÁNDEZ MALDONADO IVÁN	1105 INGENIERO FORESTAL	M	Chiapas	TAREA	8:57:00
02/06/2017	41156373	JUANES MÁRQUEZ ÁNGEL ADIVIEL	1303 INGENIERO MECÁNICO AGRÍCOLA	M	Zacatecas	ESTUDIO	8:57:00
05/06/2017	41155789	RAMÍREZ JIMÉNEZ MARIEL	1105 INGENIERO FORESTAL	F	Estado de México	CONSULTA	18:13:06

Figure 7. User registration in the information and documentation center.

vi. Online catalogs

http://biblioteca.uaaan.mx/

http://repositorio.uaaan.mx:8080/xmlui/

http://www.sidalc.net/

http://science-h.com/sh/index.php?c=6512bd43d9caa6e02c990b0a82652dca

http://remba.uaa.mx/

http://www.remeri.org.mx/portal/index.html

vii. Internet service is available through Wi Fi and Lan.

viii. There are two photocopying areas.

ix. The schedule is from Monday to Friday from 08:00 to 20:00 and Saturday from 08:00 to 15:00.

x. The community in general has 18,000 volumes to apply for a loan, as well as a consultation of 22,000 volumes.

c) Other collections (newspaper library, video library, electronic publications, specialized databases in the Academic Program area, among others).

In the newspaper library there are 675 titles and 14,875 volumes of journals, there is a collection for physical access from 1970 to 1990, the CONRYCIT website has 9 databases of electronic journals so that, there are more than 25,000 available titles.

d) Number of books on loan, available per student.

There are three daily books available per student.

e). Updated inventories.

The library has the inventory updated because it is done every year.

F). Be part of the Network of Agricultural Libraries (REMBA).

The UAAAN library is a founding member of REMBA.

7.2.2. Classrooms, laboratories and field facilities

Capacity for attention to groups

By internal regulations, the enrolling to the curricular courses must not exceed 30 students per group. This is regulated by the process of registration of students to each course where the maximum number of students who can register appears at the top of the page; when the indicated quota is covered, automatically nobody else can enroll to that course, except with the authorization of the professor responsible for the subject. Registration is via internet entering the Undergraduate School Control page.

Adequacy of the equipment of the classrooms and their versatile use according to the needs of the curriculum, with video equipment.

Of the 84 classrooms of the institution, 14 are equipped with projector, electronic whiteboard and video equipment; eight classrooms only have projector and screen (aula-inteligente_Uso¬_Polivalentes).These classrooms are at the disposal of the IAZ Program after request of the teacher responsible of the subject.

Sufficiency of equipment (furniture, lighting, ventilation, temperature, adaptations for people with different capacities, among others).

These 84 classrooms are mainly located in the buildings A, B, C, D, E and F. (Plano_aulas), (Fotografías_edificios_aulas). The classrooms are equipped with desks, whiteboard, chalk board, chair and desk for the teacher. The classrooms also have doors, windows, sufficient lighting and ventilation. All classrooms have electric light contacts to use projectors and overhead projectors (aula_uso_normal). Spaces such as labs, multi-use classrooms, auditoriums and computer center classrooms are also used by professors of the Program to teach their classes (aula_uso_múltiple), (aulas_Centro_Cómputo_Académico). As for the adaptation of facilities for people with different capacities, ramps have been built with handrails between the different buildings of classrooms, auditoriums, administrative buildings, computer center and in sports areas, which has allowed people with disabilities to move more safely and easily (Fotografías_rampas).

Use rates hour / week / semester

The enrollment of students enrolled in the PAIAZ ranges from 355 to 474. The PAIAZ teaching and educational staff uses between 17 and 20 classrooms per semester, at different times per week. The occupation percentage of these classrooms is estimated 85% based on number of courses / hours / week / semester.

Develop the study of the dependency / academic programs if necessary

The classrooms of the University are sufficient to attend the PAIAZ enrollment and meet the objectives of the curriculum.

For the development of research projects, practices and establishment of productive projects, the University also has experimental fields. These fields are distributed in different states of Mexico: Christmas, N.L., Los Lirios, Coah., Zaragoza, Coah., Las Norias, Coah., Rancho Los Ángeles and Campo Experimental Buenavista, Saltillo, Coah., Tepalcingo, Mor., Torreón and San Pedro Coah. The Experimental Fields of Celaya, Guanajuato and Úrsulo Galván, Ver., These work in collaboration with the ITUG and cooperating producers respectively, each one has the necessary infrastructure to carry out field practices and research projects.

- In most of them, a programming of research activities, practices and productive projects is carried out.
- Each teacher responsible for the courses, has the manual to perform the practices that are carried out in these experimental fields.
- Experimental fields have wineries or specific areas for safeguarding tools and materials.
- The Research Direction has a budget allocated to the maintenance, operation and updating of equipment and facilities.
- Each experimental field has all the corresponding signs, as well as buildings, warehouses and shelves.

Likewise, there is the Department of Agricultural Practices, which functions are to support the realization of field practices of the subjects that require them, providing equipment, land, materials (seed, fertilizer, among others) and tools through a request for external practices.

Rooms for videoconferences

The university has two rooms for videoconferences, one of them is in the library ¨Dr. Egidio G. Rebonato¨ and the other in the Language Unit. In the first, programs of academic interest are transmitted regularly. The second one is used daily for language instruction, but it can be requested for the transmission of congresses or conferences (Salas_Video_Conferencias).

Adaptation of the Facilities for practices and experiments

The academic program has the physical facilities required by the curriculum, the laboratories that support the Program are functional and spacious, also have adequate acoustic, lighting and ventilation, they are equipped with extractors or fans and have enough equipment and instruments to perform the practices efficiently. Identification signs, working area, warehouse, showers, emergency exits; they meet the specifications and safety standards of these areas, inventory of equipment and reagents; manuals of operation and practices, which allow them to comply with the demands of the discipline they support. Each laboratory has an internal regulation, which dispositions are attended by the people in charge, teachers and students, keeping the order and cleaning after each practice (Ficha Técnica 3).

The laboratories of the IAZ Academic Program that support the training of students are: Laboratorio de química general, Laboratorio de bioquímica, Laboratorio de Producción,Animal Nutrition Laboratory, Biology Laboratory and laboratories-workshops, in addition to the Laboratorio de Lácteos, Laboratory of Meat Products, Laboratory of Ecology of Natural Resources, Laboratory of Hydrological Basins and Photogrammetry and Photointerpretation Laboratory. The laboratories in general,

are functional (Características de los laboratorios que apoyan al Programa Académico de IAZ) and satisfy the basic needs of the Academic Program.

In addition, the students of the IAZ Program carry out practices in the barn, which has certified cows, a milking room and a refrigeration room, the Porcina unit has four warehouses, one for gestation and weaning, one for growth, one for development and another for ending. In the metabolic unit there are different species of livestock in which research projects are carried out. The Caprina unit has pens for breeding and reproduction. It is also owned by the Demonstrative Experimental Ranch Los Angeles and Santa Teresa Ranch of La Rueda, these ranches have a home-room for visitors, management pens and cellar. All these units are used by professors of the IAZ Program and students that develop internships according to the subjects that require it, as well as research projects that may involve the thesis students (Rancho Los Ángeles).

7.2.3. Recruitment and Retention of Professors

There are precedents for the implementation of a program of replacement of the faculty for retirement of the University since 2008. Currently, policies have been implemented for the teacher hired as a replacement to fill a vacant position derived from retirements, which must be documented and justified. In addition to being endorsed by the departmental academy, accordance with the procedure described in Manual para el Procedimiento de Selección y Contratación del Personal Académico de la UAAAN and meet the academic profile requirements defined by each departmental academy, according to the educational programs where it will participate.

7.2.4. Criteria and feedback to preserve the educational excellence

Background

The evaluation of the quality of academic degree programs at Universidad Autónoma Agraria Antonio Narro (UAAAN), began in a diagnostic form in 1999 by the Inter-Institutional Committees for the Evaluation of Higher Education CIEES. In October 2002, the Council for the Accreditation of Higher Education, A.C. (COPAES) recognizes the Mexican Committee for the Accreditation of Agricultural Education A.C. (COMEAA), as a non-governmental accrediting body of educational programs for higher agricultural education in Mexico at the levels of Bachelor, Advanced University Technician or Associate Professional in agricultural sciences, forestry, environmental, agribusiness, animal husbandry, rural development, and agroindustry. Since then, the COMEAA has evaluated and granted the accreditation and endorsement of the academic programs of the UAAAN.

Organization of the activities of the University

According to its current statute, the UAAAN has three main objectives:

1) To provide education and train human resources in different areas and levels, in the field of agricultural sciences and others that society requires, looking for the development of the critical thinking, humanistic vocation, democratic values and nationalist principles to be able to contribute to the solution of the general problems of the country and particularly its rural context;

2) To carry out research in its specific areas, which results promote the sustainable development of the country- technological, social, economic and ecological- considering the regional specificities; and

3) To preserve, promote, investigate and enhance culture, science and technology in general, and in a way those that are directly related to its nature and mission of service, within a process of systematic exchange with society, to contribute to sustainable development.

To develop its activities and meet the objectives, the University has a matrix organization in which the institutional academic programs are addressed in a transversal manner with the services of the three substantive functions of teaching, research and linking provided by the departments that belong to academic divisions by areas of knowledge under the guidelines and guidance of the directions of the substantive functions Teaching, Research, Communications and Development coordinated by the Academic General Direction.

Institutional academic programs are also addressed transversally by adjective function directions and their dependencies such as the Planning Department and the General Administrative Direction.

The organization described above allows the institutional regulations and all procedures and processes of teaching, research, development and linking, culture, sports, as well as support services and infrastructure, planning and administrative processes have a transversal application to all activities developed in undergraduate academic programs.

Every dependency of the administrative structure of the UAAAN has procedures manuals that indicate the processes applied to the functioning of the academic programs. The information generated is available in the Integral Academic and Administrative Information System (SIIAA) with which it is possible to calculate indicators for the analysis of the results of the processes in the quality of the programs.

7.2.5. Offices

The Department of Renewable Natural Resources has an office, auditorium, teachers ' cubicles, boardrooms and cafeteria for teachers and administrative workers (Fotografías del Departamento de Recursos Naturales).

7.2.6. Support staff

The Renewable Natural Resources Department has an auditorium with capacity for 60 people, a greenhouse and cubicles for professors. There are also administrative people assigned to the department like secretaries, accountant, research assistant, graphic designer and janitor-messengers (Fotografías del personal. The labor interests of the administrative staff are supported by the respective union (Contrato Colectivo SUTUAAAN.pdf).

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