Grassland Science
(Nippon Sōchi Gakkai-shi)

Published by
Japanese Society of Grassland Science
The Japanese Society of Grassland Science was founded in 1954 for the purpose of promoting and fostering the study of grassland and forage crop science and extending the outcomes. Membership is open to persons interested in grassland, forage crop science and related fields.

President
KAZUO SUGAWARA

Vice president
Suguru SAIGA
Norihiro SHIMIZU

Editorial Board

Editor-in Chief : Hidekazu YAMAGUCHI
Editors:
1. Grassland environment, Landscape, Grassland ecology and System analysis
   Y. SAJOH H. SAWADA M. HIRATA
   S. SUGIYAMA T. SUGIURA H. SASAKI
   M. TSUKI
2. Pasture and lawn establishment, Management and Cultivation
   M. ITO T. SUYAMA Y. MASUDA
   Y. TAKEDA Y. YOSHIMURA T. NISHIDA
   S. KOSAKA
3. Grassland utilization, Grazing, Animal management and Animal behavior
   T. FUJIIWARA K. OTSUKI Y. OGAWA
   S. SHIOYA Y. HOSOKAWA N. HASEGAWA
   M. HANADA
4. Forage conservation, Processing, Storage and Utilization
   M. OKAMOTO M. OGAWA O. KAWAMURA
   M. AMARI N. INOUE T. MASHIKO
   K. MUNEKATO T. OSHTA N. NISHINO
   Y. CAI
5. Plant physiology, Morphology, Pathology and Entomology
   T. SHIMANUKI O. MORITA S. YAMAMOTO
   Y. ISHI T. KONDO S. SATO
6. Forage crop breeding and Genetics
   H. MATSUOKA H. YAMAGUCHI H. NAKAJIMA
   E. MONMA H. NAKAGAWA T. YAMADA
7. Soil physicochemical property, Animal, Microorganism and Crop nutrition
   K. KOUNO M. SAIGUSA T. HATANAKA
8. Overseas investigation, Meteorological phenomena, Machine, Management
   S. KANO H. KOBAYASHI
9. Foreigner
   D. HUANG (Ecosystem model)
   T. KSJCI (Grassland ecology, Pasture management, Grazing)
   K. BETTERIDGE (Grassland management)
   P. SINGH (Tropical grassland)
   A.W. ILLUS (Interaction of grazing, plant and animal)
   B. KINDGER (Breeding, Biotechnology)

Editorial Secretary:
S. TAKAHASHI Y. SANADA T. YAGI
S. SHIOYA H. SASAKI K. UCHIYAMA
K. SUGAWARA

MEMBERSHIP
"Grassland Science" is issued every other month with one volume a year. The journal is supplied free of charge to the members of Japanese Society of Grassland Science. The personal membership fee (oversea) is 8,000 yen (including postage) a year for 2003. Applications for membership should be sent to the Secretary, Japanese Society of Grassland Science, c/o National Institute of Livestock and Grassland Science, 768 Senbonmatsu, Nasushiobara, Tochigi 329-2793, JAPAN. Phone : +81-287-37-7684, Fax : +81-287-37-7684, E-mail : sgakkai@naro.affrc.go.jp

INFORMATION FOR CONTRIBUTORS
"Grassland Science" publishes original contributions in the field of grassland science and technology. First author of the contributors is required to have membership. Manuscripts should be written in Japanese or English. Submit three copies including the original to the Editor, Japanese Society of Grassland Science, c/o National Agricultural Research Center for Hokkaido Region, Hitsujigaoka, Sapporo 062-8555, Japan. In detail, the Notes for Foreign Contributors should be referred.

SUBSCRIPTIONS FOR NON-MEMBERS
For non-members of the society, orders for subscription or single copy should be sent to our following agency; MARUZEN CO. LTD., BOX 5050, Tokyo International, 100-3199 JAPAN.

NOTICE ABOUT PHOTOCOPYING
In order to photocopy any work from this publication, you or your organization must obtain permission from the following organization which has been delegated for copyright clearance by the copyright owner of this publication.

<Except in the USA>
Japan Academic Association for Copyright Clearance Center, Inc. (JACC)
6-41 Akasaka 9-chome, Minato-ku, Tokyo 107-0052 Japan
Phone +81-3-3475-5618 FAX +81-3-3475-5619
E-mail : jacc@mtd.biglobe.ne.jp

<In the USA>
Copyright Clearance Center, Inc.
222 Rosewood Drive, Danvers, MA 01923, USA
Phone 1-978-750-8400 FAX 1-978-646-8600