S. Afr. J. Agric. Ext. Du Preez, Joubert, Bester & Joubert
Vol. 51 No. 3, 2023: 50-78
10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

Exploring Information Needs and Diverse Sources for the Growth and Sustainability of the South African Honeybush Industry

Du Preez, B.V.P.,[1] Joubert, M.,[2] Bester, C.[3] and Joubert, E.[4]

Corresponding Author: B. du Preez. Correspondence E-mail: bdup@sun.ac.za

ABSTRACT

Honeybush is an indigenous fynbos shrub with the potential to contribute significantly to socio-economic development in rural South Africa. However, there exists a knowledge gap on the types of information that role players in this emerging agricultural sector need to produce quality honeybush tea efficiently, as well as their preferences for obtaining information and guidance materials. A survey of 44 role players along the Honeybushsh value chain was conducted to determine the nature of the information they require and their preferred communication formats. The results show that the most pressing need is information about general honeybush cultivation, followed by detailed guidance on cultivating different species and implementing quality management systems, such as organic certification. Respondents also highlighted the urgency of improving consumer awareness of honeybush tea. Other information related to sustainable cultivation practices, enhancing the industry's sustainability and helping with marketing. Respondents preferred information from research institutions and wanted to receive the information in a face-to-face (interpersonal) format. These findings could help to improve agricultural extension and fill knowledge gaps in the South African honeybush industry.

[1] Researcher and Food Scientist: Sensory Research Facility, Department of Food Science. Stellenbosch University, Private Bag X1, Matieland 7602, Stellenbosch, South Africa. Tel. +27 21 808 9279; E-mail: bdup@sun.ac.za. Orcid 0000-0003-0813-2465

[2] Associate Professor: Centre for Research on Evaluation, Science and Technology. Stellenbosch University, Private Bag X1, Matieland 7602, Stellenbosch, South Africa. Tel. +27 21 808 9809; E-mail: marinajoubert@sun.ac.za. Orcid 0000-0003-0178-1796

[3] Senior Researcher: Crop Development Division. Agricultural Research Council (Infruitec-Nietvoorbij), Private Bag X5026, Stellenbosch 7599, South Africa. Tel. +27 21 809 3450; E-mail: besterc@arc.agric.za. Orcid 0000-0002-2356-5536

[4] Principal Researcher: Plant Bioactives Group, Post-Harvest and Agro-Processing Technologies Division. Agricultural Research Council (Infruitec-Nietvoorbij), Private Bag X5026, Stellenbosch 7599, South Africa; Extraordinary Professor: Department of Food Science. Stellenbosch University, Private Bag X1, Matieland 7602, Stellenbosch, South Africa. Tel. +27 21 809 3444; E-mail: joubertL@arc.agric.za. Orcid 0000-0002-9717-9769

Vol. 51 No. 3, 2023: 50-78
10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

Keywords: Agricultural Extension, Emerging Crop, Honeybush, Information Needs, Information Sources.

1. INTRODUCTION

The agriculture sector in developing countries is becoming progressively more knowledge-intensive as researchers continue to generate new information relevant to producers and other role players (Babu & Glendenning, 2019). As such, cutting-edge knowledge and current information are essential building blocks of effective and sustainable agriculture (Lwoga, Stilwell & Ngulube, 2011). However, despite the wealth of knowledge in research institutions, universities and government agencies, rural farmers may struggle to access information (Lwoga *et al.*, 2011). This hampers efforts to advance agriculture in most African countries (Elly & Silayo, 2013) and raises concerns as to whether the mechanisms used to disseminate information are effective and whether the information that is made available is adequate to meet farmers' needs (Elly & Silayo, 2013).

Traditionally, agricultural extension has been regarded as a means to make research-based knowledge accessible to the rural sector, focusing on increasing production, improving yields, enhancing farmers' skills and knowledge, and transferring new technologies (Davis, 2009). Nowadays, agricultural extension encompasses more than just knowledge transfer and training; it also includes helping farmers form associations, dealing with marketing issues, and collaborating with various service providers and other organisations. As such, extension can be defined as the entire set of organisations that support people engaged in agricultural production and facilitate their efforts to solve problems, link to markets and other players in the agricultural value chain, and obtain information, skills, and technologies to improve their livelihoods (Davis, 2009). Furthermore, in line with trends in public engagement with science, agricultural extension could also include components of dialogue with farmers and other role players. Dialogue enables scientists to discover concerns, expectations, and research priorities from different perspectives and build long-term trust relationships with agricultural role players (Metcalfe, 2022). Farmers not only require relevant and useful information, but they should also be able to access it in the format of their choice (Diekmann, Loibl & Batte, 2009). Nevertheless, it is common practice to design extension services without consulting farmers about their needs and preferences (Babu & Glendenning, 2019). The current study aimed to

Vol. 51 No. 3, 2023: 50-78
10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

determine the information needs and communication preferences of farmers and other role players in the South African honeybush sector.

Honeybush (*Cyclopia* spp.) is an indigenous South African fynbos shrub endemic to specific climatic zones of the Western and Eastern Cape (Joubert, Joubert, Bester, De Beer & De Lange, 2011). Honeybush tea has a long history of regional use as a medicinal plant or herbal tea that predates the 1800s (Bowie, 1830). However, Honeybush was largely unknown outside the areas where it grew naturally and was processed on a limited scale until it was 're-discovered' in the mid-1990s. At that time, the South African National Botanical Institute (SANBI) launched a project to investigate honeybush cultivation as a means of conservation (Joubert *et al.*, 2011). More honeybush research projects were subsequently undertaken by the Agricultural Research Council (ARC) of South Africa and several universities, thus renewing the enthusiasm of farmers, processors, and marketers and fuelling industry growth.

Today, honeybush tea has achieved a global presence at least to some extent (Joubert et al., 2019), contributing to the increasing market share for herbal and speciality teas (Euromonitor, 2019). Despite this, Honeybush remains a relatively small industry, especially compared to the rooibos tea industry in South Africa, which developed from *Aspalathus linearis*, another indigenous South African fynbos shrub with a limited natural habitat. Therefore, industry experts maintain that Honeybush has significant growth potential that could contribute to rural socio-economic development, providing a reliable supply of high-quality products that can be secured (ARC, 2022; Bester et al., 2016).

Research on cultivation, processing and the product, primarily performed at the ARC in partnership with universities and science councils, has played a crucial role in supporting the industry's growth (Joubert *et al.*, 2019; Joubert *et al.*, 2011). A major initiative is the ongoing research on plant improvement (Bester *et al.*, 2016; Robertson et al., 2018) and optimum cultivation and harvest practices for Honeybush (Karsen, Lötze, Valentine & Hoffman, 2022). These plant improvement studies have focused on *Cyclopia* species, including *C. genistoides* and *C. subternata* (Bester *et al.*, 2016; Joubert *et al.*, 2011). In addition, guidelines were developed for sustainable wild harvesting of *C. intermedia*, which represents the bulk of production and about 85% of the wild-harvested crop (McGregor, 2017). To improve and enhance the quality of the product, previous research focused on optimising processing conditions and unravelling the phenolic composition of the different *Cyclopia* species and the

myriad related bio-activities that promote health (Joubert *et al.*, 2019). The South African Department of Science and Innovation (DSI) funded an initiative to support the industry, especially small-scale farmers and communities, through training and research dissemination (ARC, 2022).

To date, agricultural information to rural smallholder and commercial farmers and other industry role players has mostly been channelled through traditional modes of communication via the ARC and the South African Honeybush Tea Association (SAHTA). Information channels are their websites, agricultural expositions, information brochures and manuals, industry training workshops, and field days. The ARC released its first honeybush farming manual in 2012, guiding novice and small farmers on cultivating Honeybush. Since then, industry manuals dealing with nursery practices and quality grading of herbal tea have been added.

Against the background of existing efforts to provide relevant information to various role players in the honeybush industry (see Figure 1), the current study aimed to determine whether the information needs of farmers and other key role players, such as nursery owners and managers, processors and local tea merchants, were sufficiently met, and whether the information was provided in accessible formats in line with users' preferences. To the authors' knowledge, no formal study of this nature has been performed to date, and an improved understanding of these communication needs and preferences could support improved knowledge transfer practices and the growth of the honeybush industry.

The following three research questions guided the current study as they pertained to role players in the honeybush industry:

RQ1: Which type of agricultural and/or processing and product information do the role players need?

RQ2: What information sources or channels do the role players use, and what do they prefer?

RQ3: In which formats do the role players currently access information, and which formats do they prefer?

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

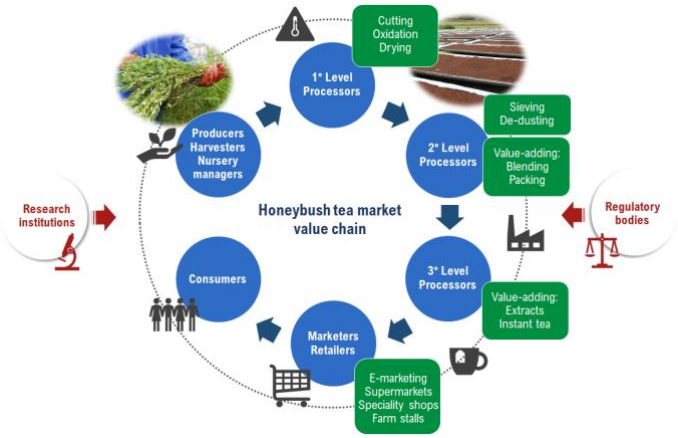

FIGURE 1: Honeybush Tea Market Value Chain From 'Crop to Cup' Depicting the Key Industry Role Players (Du Preez, 2020, p. 10).

2. METHODOLOGY

Checkbox® survey (Watertown, MA, USA) was used to conduct an electronic survey of 142 role players in the South African honeybush industry: producers (farmers), nursery owners and managers, and tea processors. Two research experts from ARC Infruitec-Nietvoorbij (Stellenbosch, South Africa), with extensive experience and personal interaction with most role players in the honeybush industry over the past 20+ years, were consulted to identify these role players across the honeybush value chain. Additional role players were identified via relevant industry websites.

The survey questionnaire was designed to collect qualitative and quantitative data on information needs, information sources, search frequencies and preferences, and demographic variables. Respondents could select an option to complete the questionnaire in English or Afrikaans.

The development steps of the survey questionnaire were the following:

- Compilation of a draft questionnaire based on a literature study and adapted from Diekmann *et al.* (2009), Elly and Silayo (2013), and Phiri, Chipeta and Chawinga (2019).
- A focus group session with two research experts from ARC Infruitec-Nietvoorbij with extensive experience in honeybush cultivation and processing research to review the draft questionnaire and to generate and/or omit variables from the questionnaire.

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

- Testing the revised questionnaire with key representatives (N = 4) of honeybush role players through e-mail correspondence and/or online testing compiled in Checkbox®.

This was done to ensure that the questions were clear and that there were no gaps in the collected information. In addition, two respondents answered semi-structured questions via e-mail to obtain complementary information to the survey results.

The questionnaire (see Addendum, Table 1) was finalised in Checkbox®. Honeybush role players' information needs were categorised into the following variables: honeybush cultivation and stages of crop production and honeybush processing and products. Respondents had to indicate on a 3-point Likert scale whether they regarded each variable as 'not important', 'neutral' or 'important'. Additionally, respondents could stipulate specific needs related to each variable in an open-ended question. Respondents could also specify any additional information needs at the end of each category in an open-ended question section. Information formats were categorised into interpersonal communication, electronic files or documents obtained via e-mail, mobile phone (e.g. WhatsApp), websites and printed documents (hard copies). Respondents were required to indicate on a 7-point Likert scale their frequency of access to information from each information source or format: 'daily', 'weekly', 'monthly', 'yearly', 'need-based', 'casual contact', and 'not applicable'. Additionally, respondents were required to indicate which information source(s) and format(s) they preferred.

Of the 142 identified role players invited to complete the questionnaire, 127 were invited electronically via a survey link. They were given one month to complete the survey, and reminders were sent electronically two and three weeks after the initial survey invitation. Another 15 role players involved in ARC development initiatives in rural communities were invited to complete hard copies of the questionnaire during field visits. The data obtained via the hard copies were entered manually into the Checkbox® database. The Statistica™ data analysis software system (Statistica™, version 14, 2020, TIBCO Software Inc., Palo Alto, CA, USA) was used to analyse quantitative data obtained between 2 September and 4 October 2021.

3. RESULTS AND DISCUSSION

The study investigated various role players' information needs and communication preferences in the emerging South African honeybush industry. Below, we summarise our findings in terms of quantitative and qualitative data.

3.1. Demographic Information

Of the 142 honeybush role players targeted for the survey, 44 respondents (31%) completed the survey. A summary of the demographics of the respondents and their involvement in honeybush cultivation and/or processing are provided in Figures 2, 3, 4 and 5.

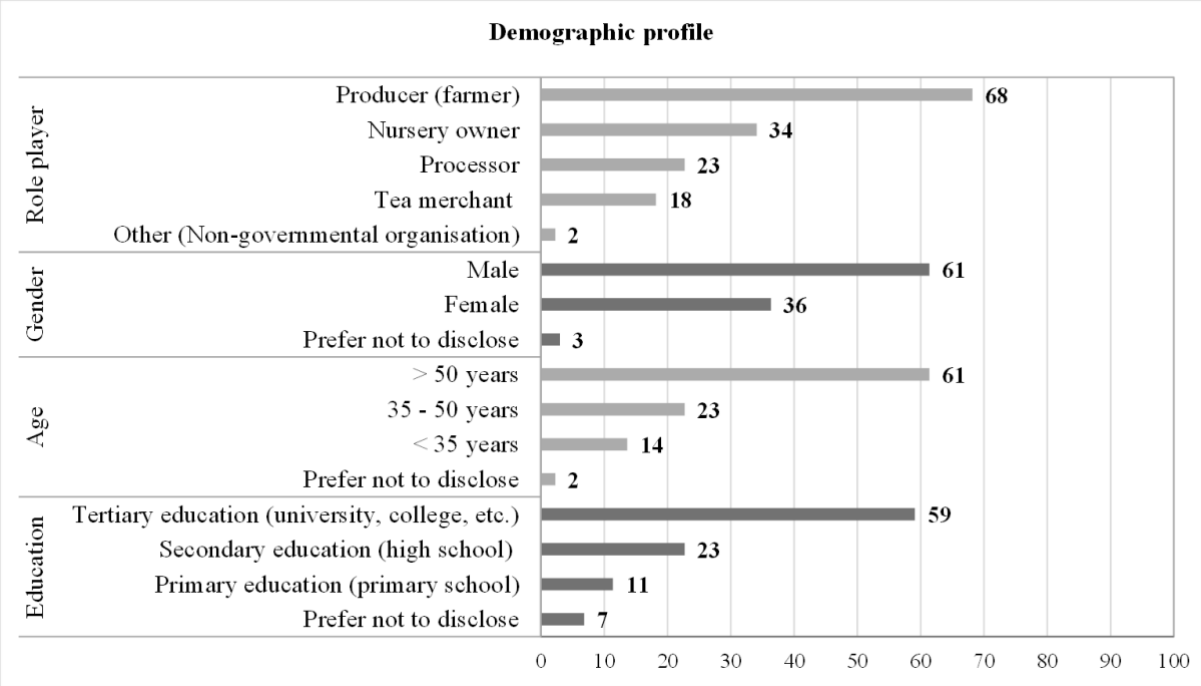

FIGURE 2: Demographic Profile of the Respondents (N = 44) Expressed as a Percentage (%).

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

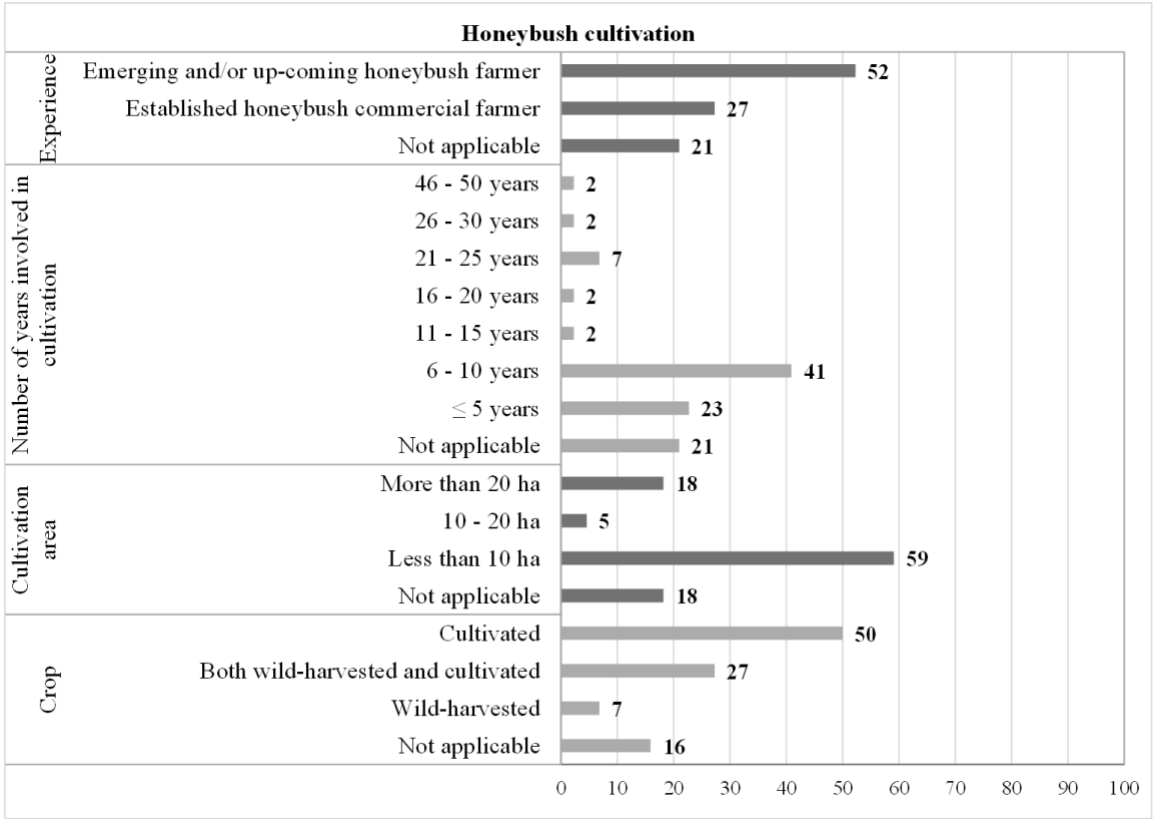

FIGURE 3: Respondents' Involvement in Honeybush Cultivation, Expressed as a Percentage (%).

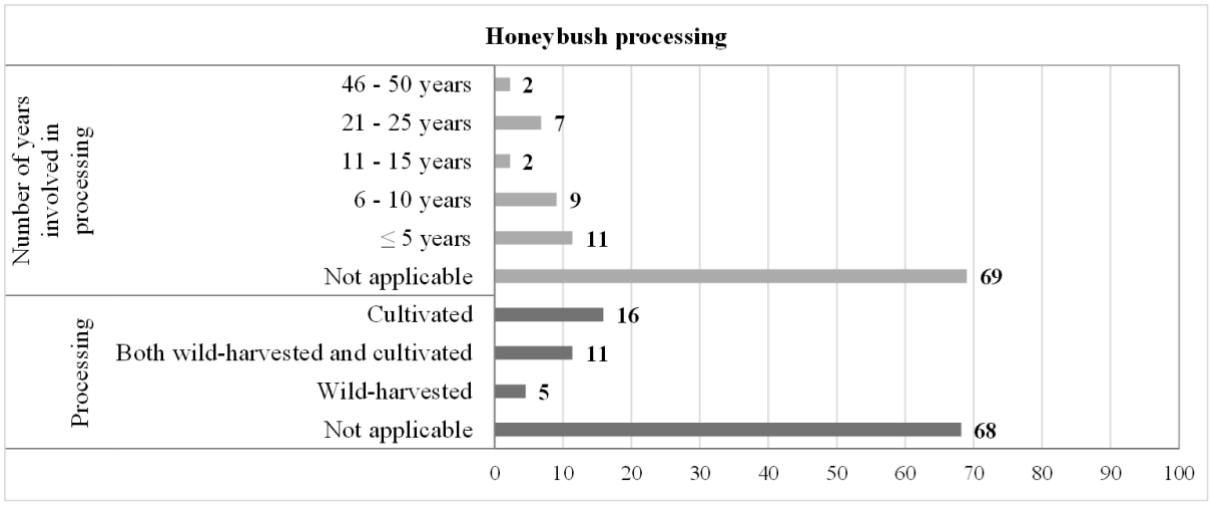

FIGURE 4: Respondents' Involvement in Honeybush Processing, Expressed as a Percentage (%).

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

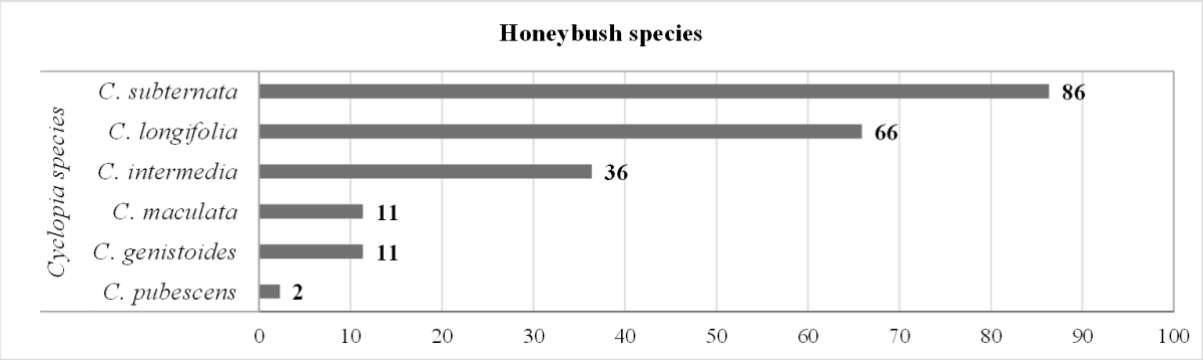

FIGURE 5: Honeybush Species Cultivated and/or Processed Expressed as a Percentage (%).

- Gender: There was a 60:40male–female split among the respondents.
- Age: Most respondents (61%) were older than 50, 23% aged between 35 and 50, and 14% younger than 35.
- Education: Most respondents had some tertiary education (59%), while the remainder completed secondary education (23%) or had attended only primary school (11%).
- Role: The majority of respondents (68%) were honeybush farmers, followed by nursery owners and/or managers (34%), processors (23%) and tea merchants (18%), keeping in mind that respondents could identify with more than one role. For example, five respondents indicated they were involved as farmers, nursery owners and processors in the honeybush value chain. In contrast, three respondents stated that they were both farmers and processors. More than half of the respondents who indicated that they were farmers (52%) said they were emerging farmers, defined as less than seven years of farming experience in the honeybush industry, while only 27% of these considered themselves established commercial honeybush farmers.
- Farming experience: The average time respondents had been farming Honeybush was eight years. Most respondents (41%) had been engaged in honeybush cultivation for 6 to 10 years, followed by respondents (23%) with five or fewer years of experience. Five respondents had more than 21 years of experience.
- Cultivation area: Only 18% of respondents farmed on more than 20 ha, compared to most respondents (59%) who cultivated less than 10 ha.
- Crop: Half of the survey respondents (50%) indicated that they farmed exclusively with cultivated Honeybush, while 27% farmed with cultivated Honeybush but also harvested wild Honeybush, and 7% relied on wild-harvested crops only.

- Species: In terms of the honeybush species on which respondents relied, most (86%) cultivated and/or processed *C. subternata*, followed by *C. longifolia* (66%), *C. intermedia* (36%), *C. genistoides* (11%), *C. maculata* (11%) and *C. pubescens* (2%).
- Processing: About one-third (32%) of respondents identified as tea processors, with experience ranging between 0 and 50 years. Of these, half (50%) processed only cultivated plant material, 34% processed wild-harvested and cultivated plant material and 16% processed only wild-harvested plant material.

It is clear from these results that the honeybush industry comprises a diverse group of role players with a wide range of educational levels, relevant experience, and cultivation and/or production capacity. This diversity contributes to the complexity and challenges of addressing the information needs and selecting suitable sources and formats.

More than half (57%) of respondents indicated they were members of the South African Honeybush Tea Association (SAHTA). The ARC had been instrumental in forming this industry body in 1999, initially named the South African Honeybush Producers Association (SAHPA), but later renamed to include all stakeholders (Joubert *et al.*, 2011). The formation of farmer-based organisations and farmer-led groups has frequently been promoted to reach smallholder farmers and to generate practical and locally tailored solutions (Babu & Glendenning, 2019; Swanson & Rajalahti, 2010).

3.2. Information Needs

Honeybush role players' information needs were categorised into honeybush cultivation, processing, and products. The percentages (%) of respondents who regarded each variable as 'important' are indicated in Figures 6 and 7.

The five most important information needs relating to honeybush cultivation (Figure 6) were cultivation (91%), *Cyclopia* species and their specific climate zones and requirements (86%), quality management systems such as organic certification (86%), legislation (82%), and harvesting practices (82%). Other information needs were plant protection and pest and disease management (80%), soil preparation (75%), irrigation (73%), improved seed varieties and where to source seeds (73%), and the use of fertilisers (70%).

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

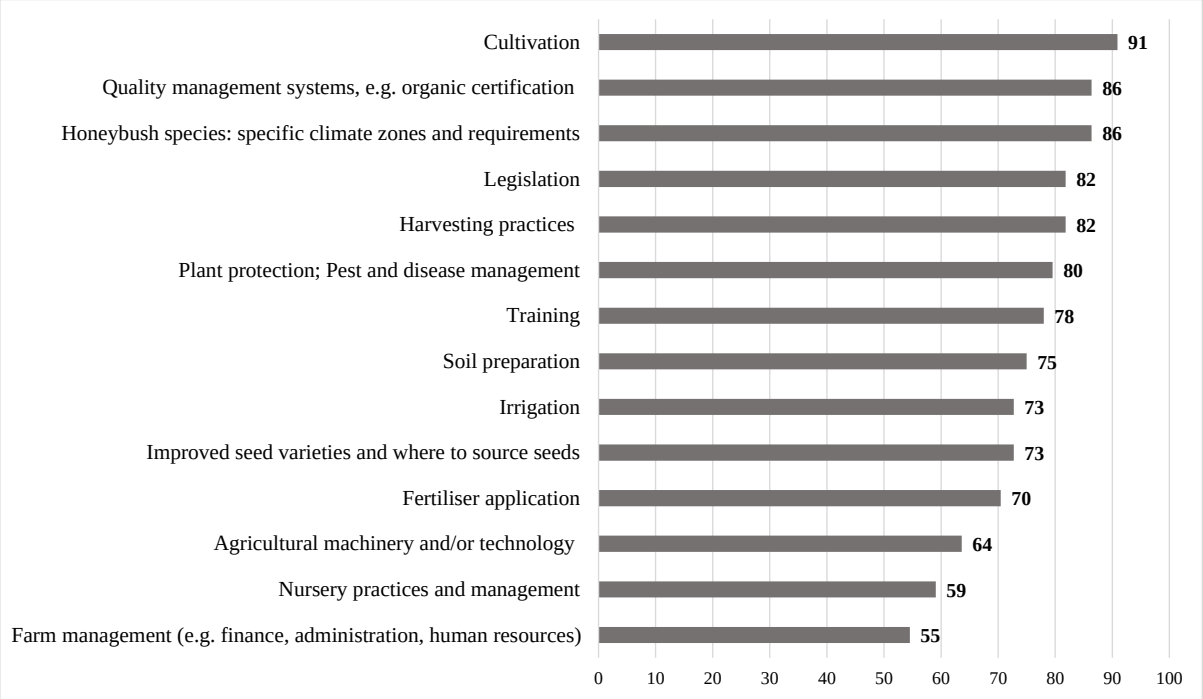

FIGURE 6: Information Needs on Honeybush Cultivation (Percentage [%] Respondents Who Indicated the Need as Important).

In the open-ended section of the questionnaire, respondents identified the following information needs:

- Industry-relevant farm management, including planning and division of labour;
- Organic nursery practices and water requirements;
- Technology progress made by farmers;
- Available cultivation machinery;
- Types of organic fertilisers, effective fertilisers and their application;
- Influence of fertilisers on quality;
- Seed varieties in terms of new genetics and resource database;
- Optimum germination time and germination in existing cultivated land;
- Water requirements of the honeybush plant, efficient irrigation technology, and methods and the influence of irrigation on quality;
- Soil preparation per region and soil type in South Africa and best practices of soil preparation for optimum growth and production;
- Control of pests in organic certified crops, and types of pesticides and insecticides and their application;
- Optimum harvesting regimes (season, frequency, weather) and mechanical harvesting;

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

- Current legislation and permits required for honeybush cultivation;
- Optimum cultivation parameters and lifespan per species;
- Guidance through the process of implementing quality management systems;
- Organic certification of wild-harvested and cultivated crops and
- Improved yield.

The need for training on honeybush cultivation, in general, was deemed essential by 78% of the respondents. In this regard, respondents indicated the need for training on farm management, nursery practices and management, fertiliser application, irrigation, soil preparation, pest and disease management, harvesting practices, and specific requirements of honeybush species to meet honeybush cultivation needs. Several respondents pointed out that organic certification agencies offered all the data needed for certification. In addition, respondents indicated that they needed training on the following topics:

- Planting techniques (including correct methods for spacing and transplanting);
- Plant densities and the effect on yield, maintenance cost and break-even points;
- Harvesting, including sustainable harvesting and correct identification of healthy and sufficiently mature plants ready for harvesting;
- Weed management and chemical residue management, including residues from neighbouring farms;
- Increasing longevity of re-seeders, e.g. *C. subternata*; and
- Computer literacy.

In addition, a seasoned commercial honeybush farmer identified the need for training on benefit-sharing, bioprospecting, and BioTrade licences. Bioprospecting can be defined as the exploration of biodiversity for commercially valuable genetic resources and biochemicals (Department of Environmental Affairs, 2012). It is regulated in South Africa by the National Environmental Management: Biodiversity Act (NEMBA) (Act No. 10 of 2004) and the Bioprospecting, Access and Benefit-Sharing (BABS) Regulations, 2008 (Department of Environmental Affairs, 2012). The Biodiversity Act and BABS Regulations set out important requirements for those using indigenous biological resources.

Additional information requirements regarding honeybush cultivation were outlined as follows:

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

- Information on *Rhizobium* inoculation (a specific kind of soil bacteria that would aid the honeybush plant, a legume, to fix nitrogen), *Cyclopia*-specific *Rhizobium* inoculant availability, and sources of the inoculum;
- Organic pest management to maintain optimum plant survival rates and
- Tea processing capacity. For example, one farmer commented, "[s]mallholder farmers with no fermentation options cannot make an existence."

The most important information needs relating to honeybush processing and products (Figure 7) were consumer awareness of honeybush tea (91%), research on its health benefits (86%), the honeybush market and marketing (national and international) (86%), quality control and sensory evaluation (86%), value addition (82%), and processing of fermented (oxidised) honeybush tea, including technology and machinery (82%). Most role players also rated information on export legislation (77%) and governing labelling claims, such as caffeine-free status (75%), as vital. One emerging farmer and processor questioned whether each processor should test these claims independently or whether a mutual industry body could perform these tests.

Most respondents (59%) identified the need for training on honeybush processing and products as important. Training needs were indicated for all six processing and product variables besides fermented tea processing. Training on export legislation and requirements were also mentioned, as were raw material selection for optimal tea quality, sensory evaluation, including training of sales personnel, food safety systems for honeybush processing, and value addition to cosmetics and related products.

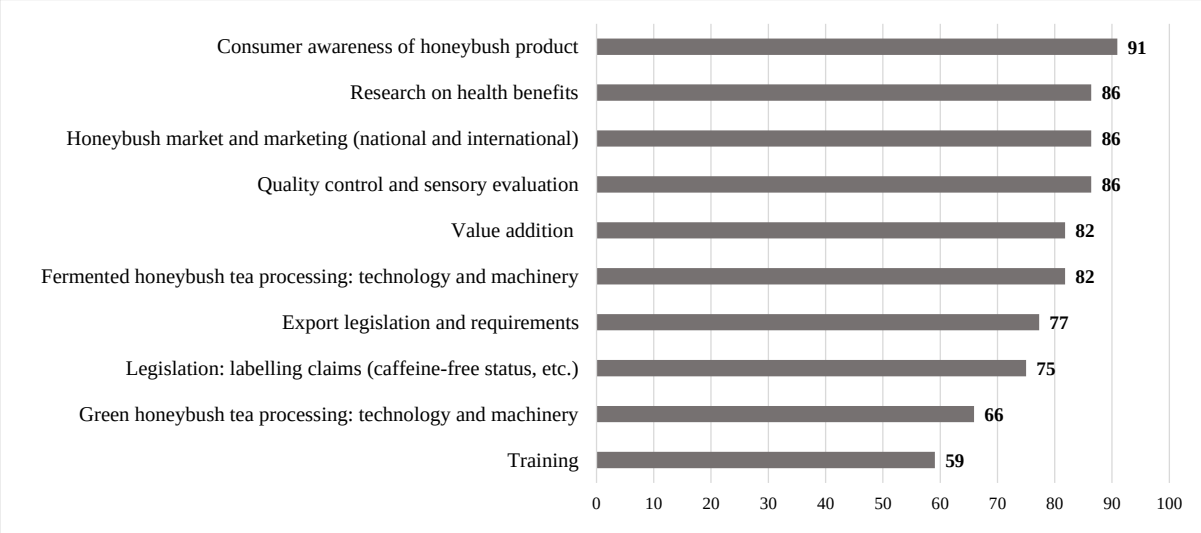

FIGURE 7: Information Needs on Honeybush Processing and Products (Percentage [%] Respondents Who Indicated the Need as Important).

The survey and additional interview questions revealed other information needs relating to honeybush processing and products, namely:

- Processing parameters of green honeybush tea compared to those of fermented honeybush tea;
- Value addition in terms of the production of extracts and ready-to-use products;
- Tea processing on a small scale, as well as the need for a central tea processing facility;
- Sterilisation of tea;
- Sensory evaluation in terms of the effect of sensory attributes of the raw material on the final product and the effect of processing on sensory attributes;
- Information on tea colour, aroma and flavour wheels, and quality control steps to determine product quality;
- Research on improving the visual appearance of steeped loose-leaf Honeybush;
- Standardised industry specifications for mesh (cut size) of tea;
- Health benefits of green honeybush tea compared to fermented honeybush tea; and
- Health benefits of honeybush tea compared to rooibos tea.

Furthermore, respondents specified the need to research new international regulations and clients' requirement trends.

These related to the presence of pyrrolizidine alkaloids (toxins exclusively biosynthesised by plants) in honeybush tea and cultivated land; the levels of mangiferin (the main phenolic

component present in Honeybush associated with health-promoting properties) in different parts of the honeybush plant, and environmental factors that may affect these levels; and the fluctuation of mangiferin levels in green honeybush tea during processing.

The necessity for sustainability was emphasised frequently in terms of the need for knowledge of sustainable agriculture methods and a sustainable enterprise. This need for sustainability may be further supported by two increasingly important global rural extension goals: protecting and managing natural resources and developing entrepreneurial and business capacity (Davis, Landini, Van Niekerk, Green & Terblanche, 2019). One respondent commented:[5]

> *The honeybush industry is still so small and young, making it very sensitive. Like most industries, new entrants join during a growth trajectory, ultimately creating an over-supply long-term. Pushing for quantity within a short time is often linked to lower quality, as honeybush processing facilities are pushed over their maximum handling capacity. We as an industry need to be more focused on growing supply and demand in parallel instead of creating demand without sustainable supply. Growing the industry in a sustainable way will enable the entire value chain to survive difficult economic times like this* [considering the global economic crisis that resulted from the COVID-19 pandemic].

Another crucial information need that emerged was reflected in role players' concerns about the current honeybush market and marketing of the product. An emerging farmer and processor noted:

> *Marketing and awareness of Honeybush must first be done before increasing cultivation. There are lots of farmers sitting with stock as sales are slow and negligible in South Africa.*

Over the past two decades, honeybush tea has attained an international footprint within the global herbal tea sector (Joubert *et al.*, 2019). The Netherlands, Germany, the United States, Canada, and the United Kingdom are major importers of honeybush tea. The tea is also exported to traditional tea-drinking countries, such as Japan, Sri Lanka, Malaysia, and China (Department of Agriculture, Forestry and Fisheries [DAFF], 2016; Joubert *et al.*, 2011), while markets on the African continent are growing. However, since 2013, export volumes have gradually decreased (Du Preez, 2020).

[5] Please note: all quotations are reproduced verbatim and unedited.

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

Respondents indicated that national marketing, in particular, and consumer awareness should be top priorities. For example, one stated, "[v]ery few South Africans are aware of honeybush." Concern was raised over the need for a council to support the industry in marketing honeybush. One processor and tea merchant stated:

> *We need to understand what the tea and herbal infusion markets are looking for and how to develop our honeybush products in line with that demand. The need exists for standardised quality levels for Honeybush products across the board, allowing us to compare our products with internationally recognised standards and provide a competitive edge in the marketplace.*

These results and concerns of different respondents show that a wide range of information needs exists within the honeybush industry. In some cases, information, such as optimum fermentation conditions for producing a high-quality product, is available, yet, respondents still identified it as a need. This clearly illustrates that disseminating information through current channels could be more effective since respondents may be unaware of existing published research results and/or uncertain where to access such information. Researchers and extension officers must address various topics on honeybush cultivation, processing, and products when formulating dissemination programmes for industry role players.

3.3. Information Sources and Formats

The five information sources (channels) that respondents mostly used were research institutions (e.g. ARC and universities) (98%); magazines with popular articles on agriculture and food and/or beverages (84%); information days, e.g. farmers' days; farmers' study groups (77%); industry role players' associations (e.g. SAHTA), through SAHTA meetings (75%); and the Internet, i.e. agricultural and food and/or beverage websites (68%). Respondents indicated that they used the following information sources to a lesser extent: radio (agricultural programmes) (57%), e-mail correspondence via the SAHTA website (57%), national newspapers (agricultural sections) (55%),and local newspapers (50%). Information sources that were accessed the least to obtain information on HHoneybush were television (agricultural and food programmes) (45%), social media platforms (e.g. Facebook, LinkedIn, YouTube) (45%), non-governmental organisations (NGOs) and other organisations (45%), agricultural industry sales representatives and/or consultants (43%), and agricultural and food exhibitions and/or

conferences (39%). Most respondents indicated their frequency of access to information sources as 'need-based', irrespective of the source.

Most of the respondents preferred to obtain their information from research institutions (64%), followed by information days (52%) and meetings of industry role players' associations (50%) (Figure 8). These sources were also among the five most used information sources.

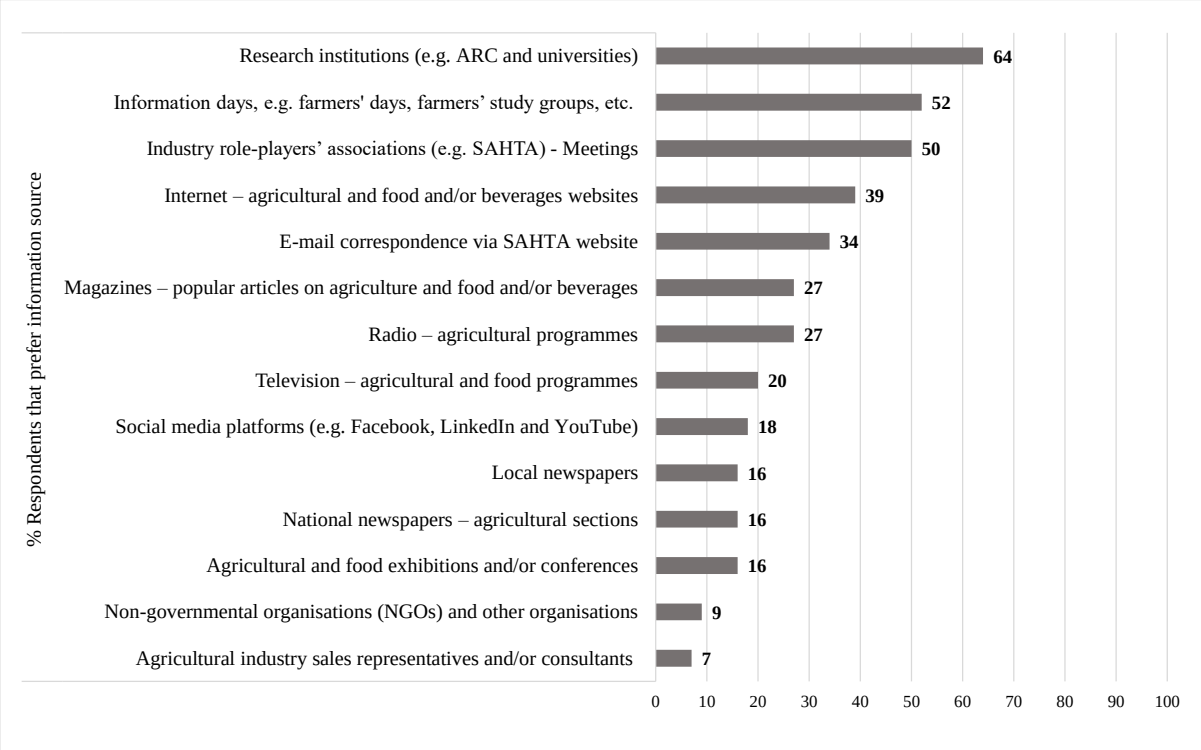

FIGURE 8: Preference of Information Sources (Percentage [%] Respondents Who Preferred the Information Source).

Most respondents used interpersonal communication, particularly face-to-face communication (86%). Also rated high were workshops and training sessions presented at a training facility or research institution (84%) and telephonic (82%) and electronic (e-mail) (80%) communication. Other information formats were electronic files (80%) and printed documents (77%), such as manuals and brochures. Video clips (e.g. YouTube) (48%) and electronic interpersonal communication, such as Zoom, Microsoft (MS) Teams and Skype (50%), were used the least. The low use of video clips may be attributed to the scarcity of online video clips on Honeybush. Most respondents indicated their frequency of use of all information formats as 'needs-based', irrespective of the format.

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

The information format preferred by most respondents was face-to-face communication (66%) in general, whether it was through meetings, workshops, farmers' days, or similar activities. Less popular were e-mail correspondence (48%) and printed documents, such as information manuals (48%), electronic documents and/or information obtained via e-mail, mobile phone, websites (45%), and workshops and training sessions presented on-site (e.g. farm) (43%) and at a training facility or research institution (41%) (Figure 9). A processor and tea vendor commented that a comprehensive and verified guide to the specific health benefits of Honeybush and a comparison between the health benefits of Honeybush and rooibos would be a valuable resource.

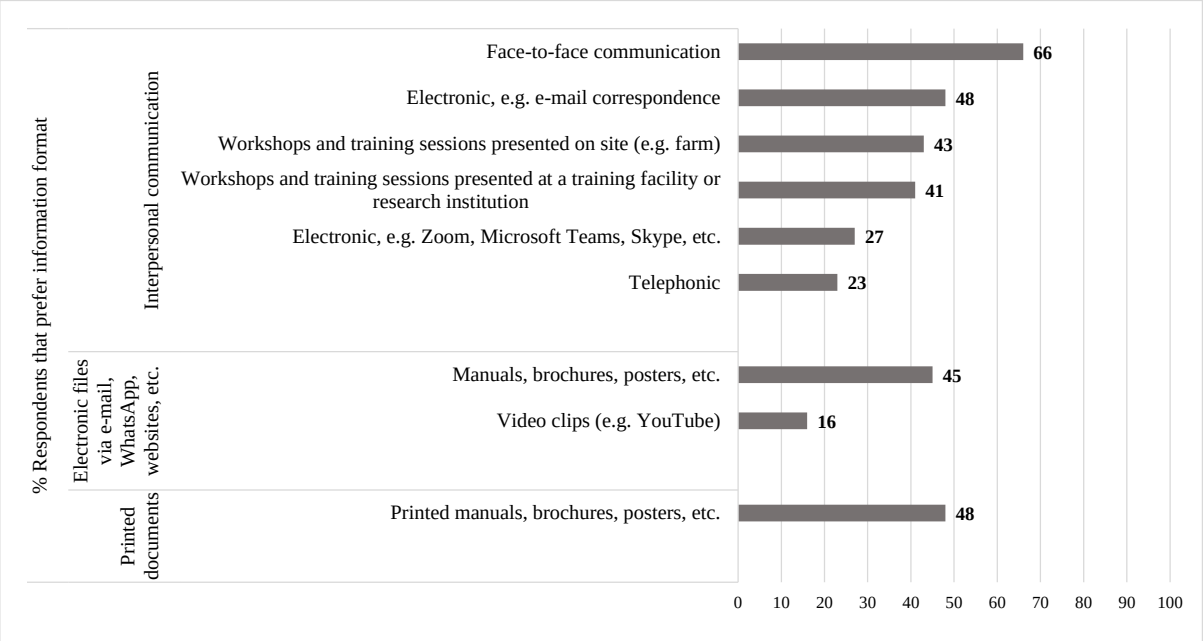

FIGURE 9: Preference of Information Formats (Percentage [%] Respondents Who Preferred the Information Format).

It is clear from these results that, when developing dissemination strategies for the honeybush industry, research institutions should be seen as key providers of information, with a high priority placed on face-to-face communication and dialogue between research institution staff and industry role players. Emphasis should be placed on training workshops and information transfer through printed and electronic documents, such as information manuals, brochures, and posters.

Our findings regarding the preference of honeybush role players for specific information and format sources were in line with findings from a study on agricultural extension officers'

perceptions of extension and innovation in South Africa. The latter study showed that South African extension officers' most valued extension approach was dialogue and inter-institutional coordination, followed by participatory farmer-led extension (Davis *et al.*, 2019).

Two respondents indicated that the knowledge they gained on honeybush cultivation and processing over the past decade or two was mainly based on trial and error and experience working in the field, not necessarily from official information sources. Traditional means to obtain information were by word of mouth and anecdotal information sharing. One farmer and processor noted that their farming region has not yet organised field days. It was also noted that, although information has been offered to fellow farmers, it was often ignored, and few had achieved success, "[i]t is a general tendency to take shortcuts in honeybush cultivation and not to follow advice, often leading to failed plantings."

In response to the question about the difficulties or barriers encountered in obtaining and using information on Honeybush, one processor mentioned the need for a single portal or site where all the pertinent information is stored and catalogued:

> *The trustworthiness of the information needs to be verifiable and backed by experience and science. The legitimacy and credibility of the sources of information we need or are looking for are important, namely from a recognised source.*

The online information about the health-promoting properties of Honeybush needs to be more accessible and comprehensive, with clear indications of credible sources. One of the respondents also highlighted the need for tertiary institutions to work closely with industry role players in developing systems and protocols that are relevant and applicable to an emerging industry such as Honeybush.

3.4. Willingness to Participate in Future Research and Information Sharing

Respondents were invited to provide their contact information voluntarily if they were willing to participate in interviews for further research on information needs. Of the respondents, 93% provided their contact information for research purposes. Furthermore, respondents could indicate on which information topics they would like to share their experience in the quest to further the honeybush industry. Among the respondents, 61% indicated they were willing to share their expertise and experience in agriculture, 36% in markets and marketing, 34% in processing, and 34% in products and value addition (30%). One respondent indicated sharing

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

of experience on certification. This encouraging pattern of passing on knowledge gained through experience and willingness to participate in studies to advance dissemination within the honeybush value chain aligns with a more participatory or farmer-led learning approach. For such an approach, farmers' empirical knowledge and experience are acknowledged and revalued (Duveskog, Friis-Hansen & Taylor, 2011).

4. CONCLUSION

Recognising the importance of timely and credible information in supporting agricultural operations, the current study focused on role players' information needs and preferences along the honeybush value chain. Our study revealed diverse information needs within the honeybush industry, and a wide range of topics on honeybush cultivation, processing and products should be addressed.

The high demand for information about crop cultivation is understandable, given that honeybush farming is still a relatively young and emerging agricultural sector, with several emerging farmers and nurseries. The need for information on quality management is also increasing as the industry's growth accelerates. There is also a high demand for information about health properties and value-adding possibilities to support ambitions for expansion of the export market of honeybush tea.

However, role players were concerned about the sector's slow growth, placing a high premium on more consumer awareness and effective product marketing.

Research organisations (research councils and universities) are vital in providing information and are generally trusted and preferred as information sources. Role players favour face-to-face communication, such as training workshops at research institutions, but also value context-specific publications in the form of manuals and other documents made available in a printed or electronic format.

Additionally, it can be inferred from the results of this study that role players' information needs and communication preferences will vary according to the extent of their experience, knowledge levels, the size of their honeybush operations, and their internet access. Therefore, those who provide information must cater to diverse communication needs and preferences.

Ongoing research to address honeybush role players' knowledge gaps and information needs would ultimately aid in creating a thriving and sustainable industry.

5. ACKNOWLEDGEMENTS

This study was supported by funding received from the DSI (Contract DST/CON 00029/2019).

The Research Ethics Committee for Social, Behavioural and Education Research at Stellenbosch University approved the study (project no. 22402).

REFERENCES

AGRICULTURAL RESEARCH COUNCIL (ARC)., 2022. *Honeybush – about the DSI/ARC Honeybush Project.* Available from: http://www.arc.agric.za/arc-infruitec-nietvoorbij/honeybush/Pages/default.aspx

BABU, S.C. & GLENDENNING, C.J., 2019. Information needs of farmers: A systemic study based on farmer surveys. In S.C. Babu & P.K. Joshi (eds.), *Agricultural extension reforms in South Asia*. London, UK; San Diego, CA, USA: Academic Press.

BESTER, C., JOUBERT, M.E. & JOUBERT, E., 2016. A breeding strategy for South African indigenous herbal teas. *Acta Hortic.*, 1127: 15–22.

BOWIE, J., 1830. Sketches of the botany of South Africa. *South African Quart. J.*, 1: 27–36.

Department of Agriculture, Forestry and Fisheries (DAFF)., 2016. *A profile of the South African honeybush tea market value chain*. Pretoria.

DAVIS, K., LANDINI, F., VAN NIEKERK, J., GREEN, K. & TERBLANCHE, S.E., 2019. Extension officers' perceptions of extension and innovation in South Africa. *SAJAE*, 47(4): 152–161.

DAVIS, K.E., 2009. *Agriculture and climate change: An agenda for negotiation in Copenhagen. The important role of extension systems*. Focus 16, Brief 11. Washington, DC: International Food Policy Research Institute.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS., 2012. *South Africa's bioprospecting, access and benefit-sharing regulatory framework: Guidelines for providers, users and regulators*. Pretoria.

DIEKMANN, F., LOIBL, C. & BATTE, M.T., 2009. The economics of agricultural information: Factors affecting commercial farmers' information strategies in Ohio. *RAE*, 31(4): 853–872.

DU PREEZ, B.V.P., 2020. Development of a quality grading system for the honeybush (*Cyclopia* spp.) tea industry. Doctoral thesis, Stellenbosch University.

DUVESKOG, D., FRIIS-HANSEN, E. & TAYLOR, E., 2011. Farmer field schools in rural Kenya: A transformative learning experience. *J. Dev. Stud.*, 47(10): 1529–1544.

ELLY, T. & SILAYO, E.E., 2013. Agricultural information needs and sources of the rural farmers in Tanzania: A case of Iringa rural district. *Library Review.*, 62(8/9): 547–566.

EUROMONITOR., 2019. Infused with purpose: Herbal teas and the pursuit of wellness. Available from: https://www.euromonitor.com/infused-with-purpose-herbal-teas-and-the-pursuit-of-wellness/report

JOUBERT, E., DE BEER, D., MALHERBE, C.J., MULLER, M., LOUW, A. & GELDERBLOM, W.C.A., 2019. Formal honeybush tea industry reaches 20-year milestone: Progress of product research targeting phenolic composition, quality and bioactivity. *S. Afr. J. Bot.*, 127: 58–79.

JOUBERT, E., JOUBERT, M.E., BESTER, C., DE BEER, D. & DE LANGE, J.H., 2011. Honeybush (*Cyclopia* spp.): From local cottage industry to global markets – the catalytic and supporting role of research. *S. Afr. J. Bot.*, 77: 887–907.

KARSEN, P.A., LÖTZE, E., VALENTINE, A.J. & HOFFMAN, E.W., 2022. Propagation and cultivation practices of Honeybush (*Cyclopia* spp.) for the sustainable production of an export quality indigenous South African tea. *Crop Sci.*, 62(5): 1702-1733.

LWOGA, E.T., STILWELL, C. & NGULUBE, P., 2011. Access and use of agricultural information and knowledge in Tanzania. *Library Review*, 60(5): 383–395.

MCGREGOR, G.K., 2017. *Guidelines for the sustainable harvesting of wild Honeybush.* Department of Environmental Affairs and Development Planning. Available from: https://www.sahta.co.za/index.php/more-info/honeybush-harvesting-guidelines

METCALFE, J., 2022. Comparing science communication theory with participatory practice: Case study of the Australian Climate Champion Program. *J. Sci. Commun.*, 21(2): 1–29.

PHIRI, A., CHIPETA, G.T. & CHAWINGA, W.D., 2019. Information needs and barriers of rural smallholder farmers in developing countries: A case study of rural smallholder farmers in Malawi. *Inf. Dev.*, 35(3): 421–434.

ROBERTSON, L., MULLER, M., DE BEER, D., VAN DER RIJST, M., BESTER, C. & JOUBERT, E., 2018. Development of species-specific aroma wheels for *Cyclopia genistoides*, *C. subternata* and *C. maculata* herbal teas and benchmarking sensory and phenolic profiles of selections and progenies of *C. subternata*. *S. Afr. J. Bot.*, 114: 295–302.

SWANSON, B. & RAJALAHTI, R., 2010. *Strengthening agricultural extension and advisory systems: Procedures for assessing, transforming, and evaluating extension systems*. Agricultural and Rural Development Discussion Paper 45. Washington, DC: The World Bank.

Vol. 51 No. 3, 2023: 50-78
10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

ADDENDUM

TABLE 1: Survey Questionnaire (adapted from Diekmann *et al.*, 2009; Elly & Silayo, 2013; Phiri *et al.*, 2019).

Section A: Information needs		**How important is this information?** *[Select one that applies: 1 - 'This is not important to me'; 2 - 'I feel neutral about this'; 3 - 'This is important to me']*	**Give specific information need(s) where applicable.**
A1	**Honeybush cultivation**		
1	Honeybush cultivation	*Checkboxes*	*Open-ended question*
2	Honeybush species: specific climate zones and requirements	*Checkboxes*	*Open-ended question*
3	Improved seed varieties and where to source seeds	*Checkboxes*	*Open-ended question*
4	Nursery practices and management	*Checkboxes*	*Open-ended question*
5	Soil preparation	*Checkboxes*	*Open-ended question*
6	Fertiliser application	*Checkboxes*	*Open-ended question*
7	Plant protection/Pest and disease management	*Checkboxes*	*Open-ended question*
8	Irrigation	*Checkboxes*	*Open-ended question*
9	Agricultural machinery and/or technology	*Checkboxes*	*Open-ended question*
10	Harvesting practices	*Checkboxes*	*Open-ended question*
11	Farm management (e.g. finance, administration, human resources (HR), etc.)	*Checkboxes*	*Open-ended question*
12	Legislation	*Checkboxes*	*Open-ended question*
13	Quality management systems e.g., organic certification, etc.	*Checkboxes*	*Open-ended question*
14	Training:	*Checkboxes*	*Open-ended question*
	(give example(s) of training topic) _____	*Open-ended question*	
15	Other needs regarding cultivation:	*Open-ended question*	-

	(elaborate) _____		
A2	**Honeybush processing and products**		
1	Green honeybush tea processing: technology and machinery	*Checkboxes*	*Open-ended question*
2	Fermented honeybush tea processing: technology and machinery	*Checkboxes*	*Open-ended question*
3	Quality control and sensory evaluation	*Checkboxes*	*Open-ended question*
4	Export legislation and requirements	*Checkboxes*	*Open-ended question*
5	Legislation: labelling claims (caffeine-free status, etc.)	*Checkboxes*	*Open-ended question*
6	Honeybush market and marketing (national and international)	*Checkboxes*	*Open-ended question*
7	Consumer awareness of honeybush product	*Checkboxes*	*Open-ended question*
8	Value addition	*Checkboxes*	*Open-ended question*
9	Research on health benefits	*Checkboxes*	*Open-ended question*
10	Training:	*Checkboxes*	*Open-ended question*
	(give example(s) of training topic) _____	*Open-ended question*	
11	Other needs regarding processing and products:*(elaborate)* _____	*Open-ended question*	-

Table 1 *(continued)*

Section B: Information sources and formats		**Do you make use of this information source/format to obtain information relating to honeybush cultivation, processing and products** *[1 - Yes; 2 - No]*	**How often do you use this information source/format to obtain information relating to honeybush cultivation, processing and products?** *[1 – Not applicable; 2 - Daily; 3 - Weekly, 4 - Monthly, 5 - Yearly; 6 – Need-based, 7 - Casual contact]*	**Indicate the information source(s)/format(s) that you prefer the most.** *[more than one option may be selected]*
B1	**Information sources**			
1	Information days e.g. farmers' days, farmers' study groups, etc.	*Checkboxes*	*Checkboxes*	*Checkboxes*
2	Industry role-players' associations (e.g. South African Honeybush Tea Association [SAHTA]) - Meetings	*Checkboxes*	*Checkboxes*	*Checkboxes*
3	E-mail correspondence via SAHTA website	*Checkboxes*	*Checkboxes*	

4	Agricultural industry sales representatives/consultants	*Checkboxes*	*Checkboxes*	*Checkboxes*
5	Agricultural and food exhibitions and/or conferences	*Checkboxes*	*Checkboxes*	*Checkboxes*
6	Non-governmental organisations (NGOs) and other organisations	*Checkboxes*	*Checkboxes*	*Checkboxes*
7	Research institutions (e.g. Agricultural Research Council [ARC] and universities)	*Checkboxes*	*Checkboxes*	*Checkboxes*
8	Internet – agricultural and food and/or beverages websites	*Checkboxes*	*Checkboxes*	*Checkboxes*
9	Social media platforms (e.g. Facebook, LinkedIn, YouTube)	*Checkboxes*	*Checkboxes*	*Checkboxes*
10	Radio – agricultural programmes	*Checkboxes*	*Checkboxes*	*Checkboxes*
11	Television – agricultural and food programmes	*Checkboxes*	*Checkboxes*	*Checkboxes*
12	Magazines – popular articles on agriculture and food and/or beverages	*Checkboxes*	*Checkboxes*	*Checkboxes*
13	National newspapers – agricultural sections	*Checkboxes*	*Checkboxes*	*Checkboxes*
14	Local newspapers	*Checkboxes*	*Checkboxes*	
15	Other *(specify information source)*: ___	*Open-ended question*		
B2	**Information formats**			
1	Interpersonal communication			
	a) Face-to-face	*Checkboxes*	*Checkboxes*	*Checkboxes*
	b) Telephonic	*Checkboxes*	*Checkboxes*	*Checkboxes*
	c) Electronic, e.g. E-mail correspondence	*Checkboxes*	*Checkboxes*	*Checkboxes*
	d) Electronic, e.g. Zoom, MS Teams, Skype, etc.	*Checkboxes*	*Checkboxes*	*Checkboxes*
	e) Workshops and training sessions presented on-site (e.g. farm)	*Checkboxes*	*Checkboxes*	*Checkboxes*
	f) Workshops and training sessions presented at a training facility/research institution	*Checkboxes*	*Checkboxes*	*Checkboxes*
2	Electronic via e-mail, 'WhatsApp', websites, etc.:			
	a) Manuals, brochures, posters, etc.	*Checkboxes*	*Checkboxes*	*Checkboxes*
	b) Video clips (e.g., YouTube)	*Checkboxes*	*Checkboxes*	*Checkboxes*

3	Printed documents: Printed manuals, brochures, posters, etc.	*Checkboxes*	*Checkboxes*	*Checkboxes*

Table 1 *(continued)*

Section C: Demographic and role information (your contribution to the honeybush industry)		**Complete the following sections.** **[select where applicable]**
C1	**Honeybush industry role-player** *(Select all that apply)*	
	Farmer (producer); Nursery owner or manager; Processor; Tea merchant	*Checkboxes*
	Other (indicate role player): _____	*Open-ended question*
C2	***Cyclopia* species cultivated and/or processed** *(Select all that apply)*	
	C. genistoides; C. subternata; C. longifolia	*Checkboxes*
	Other *(specify species name)*: _____	*Open-ended question*
C3	**Cultivation area size** *(if applicable)*	
	Less than 10 ha; 10 - 20 ha; more than 20 ha; Not applicable	*Checkboxes*
C4.1	**Experience (Farmer/Producer)** *(if applicable)*	
	I am an experienced honeybush farmer (more than 7 years' experience); I am an up-coming/emerging honeybush farmer; Not applicable	*Checkboxes*
C4.2	**Experience: Time** *(if applicable)*	*Open-ended question*
	a) Farming with Honeybush: i) Wild-harvested, Cultivated; Both ii) Number of years involved: _____	
	a) Processing of Honeybush: i) Wild-harvested, Cultivated; Both ii) Number of years involved: _____	
C5	**Gender**	
	Male; Female; I prefer not to disclose	*Checkboxes*
C6	**Age**	

	Less than 35 years; 35 - 50 years; more than 50 years; I prefer not to disclose	*Checkboxes*
C7	**Education** I did not attend formal school; Primary education (primary school); Secondary education (high school); Tertiary education (university, college, etc.); I prefer not to disclose	*Checkboxes*
C8	**South African Honeybush Tea Association (SAHTA) membership** Yes; No	*Checkboxes*
C9.1	**Contact information** We value your input very much. Should we have any follow-up questions on your information and information sources needs, please provide your contact details if we may contact you for a short telephonic interview. Name and surname: ___; E-mail address: ___; Mobile phone number: ___	*Open-ended question*
C9.2	To further develop the industry, would you like to share your experience and knowledge on the following aspects? *(select all that apply)* Information on: Cultivation; Markets/marketing; Processing; Products/value addition; None of the above Other: ____ *(specify information topic)*	*Checkboxes* *Open-ended question*
C10	Please provide any additional comments and/or concerns below *(if applicable)*: ____	*Open-ended question*

TABLE 2: Interview Questions Used for Selected Key Informants (adapted from Elly & Silayo, 2013).

	Interview questions
1	What are your specific honeybush cultivation, processing and/or product information needs?
2	Where do you currently look for or find honeybush cultivation, processing and/or product information?
3	What are the main factors influencing your information needs?
4	What are the main factors influencing your choice of the sources of information?

10.17159/2413-3221/2023/v51n3a14650 (License: CC BY 4.0)

5	Are there any traditional ways of communicating honeybush cultivation, processing and/or product information among honeybush farmers, nursery owners and/or processors in your area?
6	Which of the honeybush cultivation, processing and/or product information that you have received have you tried and adopted in your profession?
7	What are the challenges or obstacles that you face in accessing and using information?
8	Do you think the honeybush cultivation, processing and/or product information that you have access to is useful in agricultural and/or processing activities in your area?
9	In your opinion, what should be done to ensure proper access to current and relevant honeybush cultivation, processing and product information?