



Experience with research collaboration between University of Applied Science and the agricultural and forestry sector

Dr. Harald Menzi
Research Co-ordinator

Swiss College of Agriculture (SHL), Zollikofen, Switzerland
University of Applied Science Berne



SHL in a nutshell

- The only Swiss University of Applied Sciences offering BSc-courses in Agriculture, Forestry (since 2004); also active in Food Science
 - 360 students (approx. 200 agronomy)
 - 45 professors, 150 total staff
 - Completely modularised study program since 2001; ECTS Credit system
 - MSc course "Sustainable Agricultural and Forestry Systems" starting September 2009
- An applied research and development institute and an interface between research and practical agriculture/forestry/dairy processing





Our challenge in 2000

- With the status of University of Applied Science we in 1999 received the mandate to be active in applied R&D and services
 - UAS get minimal financial contribution for research
 - No experimental site and scarce laboratory infrastructure
 - Strong Agricultural Research at Federal Research stations of the Ministry of Agriculture (total staff approx. 700; "free" research for the industry)
- + Many of our professors have a research background and are highly motivated to do research
- + We have a good network in the agricultural sector
- + The Federal Research Stations are restructured (budget cut)



Our starting strategy

- Collaboration not confrontation with competitors
- We have to find niches
 - Not (or not fully) covered by the Federal Agricultural Research Stations
 - Where our staff has a strong background
 - Where our status as UAS gives us an advantage over our competitors
 - Where we can find appropriate funding
- We have to identify urgent research topics and convince the Agricultural Sector to get involved in kind and financially
 - Farms too small to be direct partners but interested in innovation
 - Public institutions (e.g. extension services) have no funding
 - Convince companies to collaborate with us
 - Convince sector organizations to invest in R&D activities
 - Find public funding agencies which support such activities



Our strategy (2)

- **R&D at SHL is characterized by**
 - On-farm research with a sound scientific basis
 - A holistic approach
 - Proximity to customers and partners (participative research)
 - Directly applicable techniques and recommendations that fit the specific needs of our customers
 - Strong knowledge transfer to our partners and the whole agricultural sector (unless confidentiality contract)
 - High flexibility
 - Extensive collaboration network (national and international)



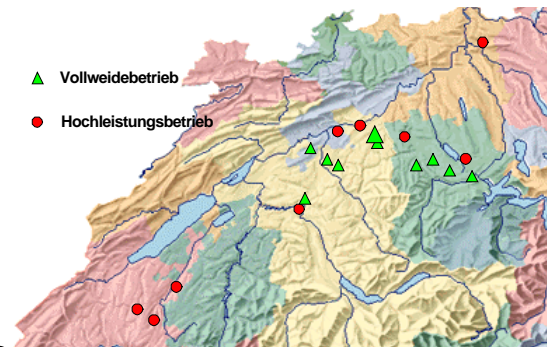
Project example 1

Optimisation of different dairy production strategies

- Aims:**
- Optimization of the high yield and the low cost strategy dairy production on pilot farms
 - Realisable and differentiated recommendations for finding and implementing the farm-specific best strategy

Organisation:

- 9 pilot farms per strategy
- Farm-specific optimization of strategy farmer with SHL support
- Experience exchange groups for the pilot farmers
- Regular data collection over 2.5 years





Project example 1

Optimisation of different dairy production strategies

- Collaboration:**
- Financing: dairy producers association (SMP), Commission for Technology and Innovation (CTI), Swissgenetics (AI company)
 - Research partners: Cantonal extension services, Swissgenetics, Fed. Research Stations ALP and ART

Products:

- Approx. 50 articles in farmers journals
- 2 demonstration farms
- 5 applied conferences; contributions to scientific conferences
- PC tools: forrage cost model, "milk manager"
- Training course and coaching program for extensionists in strategy optimization and monitoring (with extension services)





Following projects on dairy production strategies

- Which dairy cow type is best suited for Swiss production conditions
 - with Swiss Cattle Breeders Ass., cantonal extension service and farm
 - Supported by CTI
- Dairy production and processing strategies for mountain areas
 - Sub-projects production, processing, multifunctional role
 - With SMP, 3 Cantons, Migros (largest retailer), Berghilfe, ALP
 - Supported by CTI and Ministry of Agriculture
- Comparison of high yield and low cost strategy herd on the same farm
 - With Canton, SMP, ZMP, several research stations etc.
- Comparison of New Zealand and Swiss cows for full grazing strategy
 - With farmers "interest group pasture milk", Swissgenetics, ALP; supported by CTI
- Service mandates in India, Kosovo, China



Following projects on dairy production strategies

- The new appearance of Swiss mountain cheese





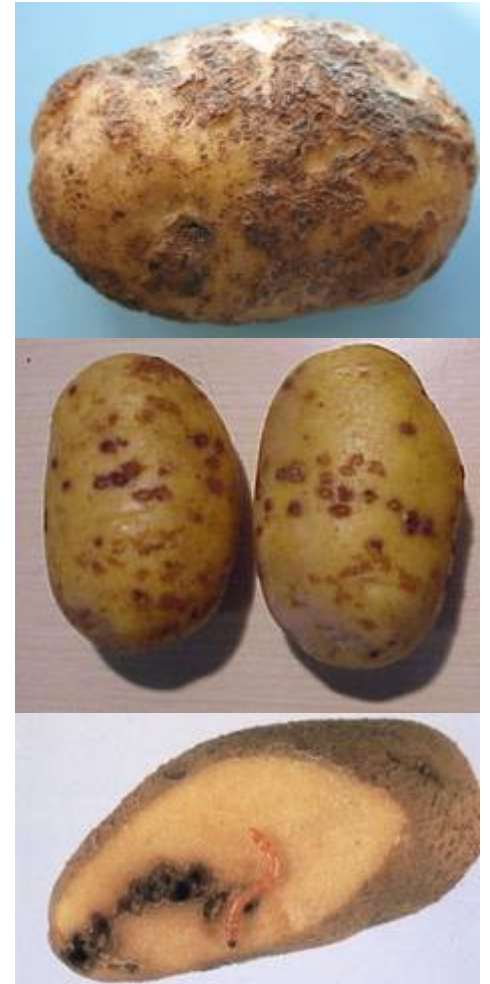
Project example 2

Improved potato quality

- Aims:**
- What are the reasons for increasing quality problems in potatoe production?
 - Differentiated recommendations on managment options to improve quality
 - general improvement of potatoe quality

Organisation:

- Experimental sites on 96 farms over 3 years
- Collection of site and managment data
- Assessment of approx. 15 quality criteria on representative tuber samples
- Statistical analysis of interactions quality management
→ Causes of quality deficiencies, recommendations





Project example 2

Improved potato quality

Partners:

Financing:

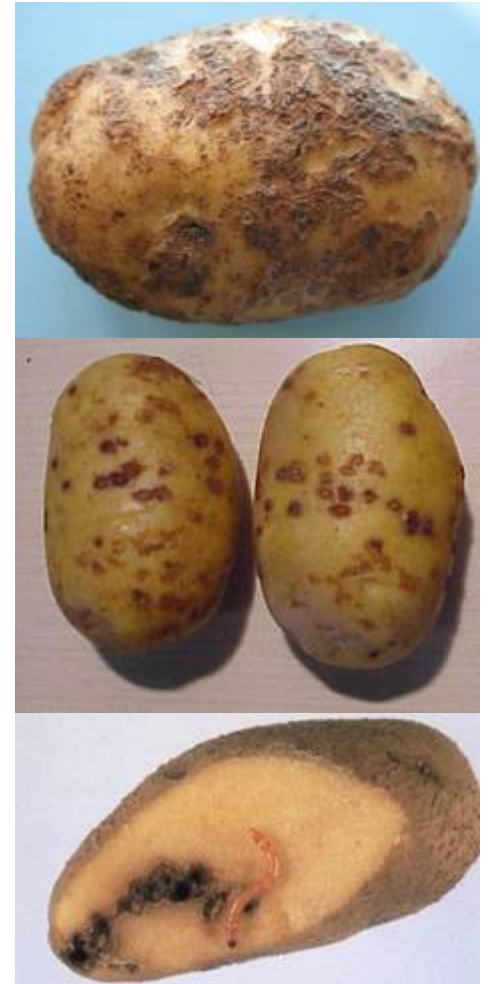
- Swisspatat (potato sector organization with representatives of potato producers, processors and retailers)
- Commission for Technology and Innovation (CTI)

Collaboration:

- Extension services in all potato growing areas, farms, research station, ETH, international contacts

Products:

- Differentiated recommendations for quality improvement strategies for different production systems
- Yearly farmers workshops in all potato producing regions
- Numerous publications in practical journals
- Several reviewed publications and conference contributions





Following projects on potatoe quality

- Cooking type and quality of potatoes
 - Supported by Swisspatat, CTI
 - With ETH, ATB Bornim, Supported by CTI
- Improving potatoe seed quality with respect to powdery scab
 - With Swisspatat, ETH etc., Bioreba SA, supported by CTI
 - Resulting in a branch strategy or improving potatoe seed quality
- Erwinia
 - In preparation
 - With collaboration in Israel, Netherlands etc.



Other important areas

- Projects for Federal Offices (Ministries)
 - Ammonia emission inventory and mitigation options
 - Different forestry projects
 - Studies for the Federal Office of Agriculture
- Projects in development co-operation
 - Mostly grouped as "services" for traditional reasons
 - Contribute about 50% to our "expertise" budget and 1/3 of work load
 - Active in about 20 countries each year
 - Collaboration with CGIAR Institutes, FAO, LEAD Initiative



Summary overview of our R&D partners in 2008

Sector organizations

- Dairy producers; cattle breeders; porc producers; potatoe producers; cereal producers; seed producers

Companies

- Breeding and AI, dairy products, meat processing, potato processing and retailers, machinery, seeds, fertilizer, forestry, ICT, retailer chains, Nestlé, Syngenta, Pfyzer

Private enterprises

- About 80 farms and 6 small dairies

NGOs

- Animal Welfare, Promotion of Mountain Regions, ProQuercus



Summary overview of our R&D partners in 2008

Public institutions

- Federal Office (Ministry) of Agriculture, Environment, International Affairs, Veterinary Affairs, Health, Energy
- Several Cantons, national and cantonal agric. and forestry extension services

Research organizations in Switzerland

- ETH (Swiss Federal Inst. Of Technology), several universities, all Federal Agricultural Research Stations, Inst of Organic Agriculture, WSL, EAWAG

Research organizations abroad

- Collaborative projects: Several in DE, AU, DK, NL, UK, IR, IT, PL, Asia, Africa, Latin America; CGIAR institutes
- Regular contacts in Australia, New Zealand, USA, IR



The important role of CTI

- CTI (formerly "Swiss Commission for Technology and Innovation" supports innovative projects of SMEs together with public research institutions
 - "Industry" (companies, non-Federal public and private institutions) carry >50% of total costs (incl. in kind contribution); with high in kind contribution 1 SFR cash contribution can release up to 10 SFR public funding
 - Project should result in product with good market potential
 - CTI money only for researchers salaries
- Very important for convincing companies and sector institutions to support projects
- We had a crucial problem when CTI intermitantly did no longer accept improvement of production strategies as "product"



Achievements

- SHL is accepted as research institution
- SHL is today an nationally and internationally accepted centre of competence for:
 - Optimisation of dairy production strategies
 - Improvement of potato quality
 - Livestock environment interactions
 - Sustainability evaluation of agricultural production systems
- Increasing importance of forestry projects (economy, ecology, natural hazards associated with forests)
- R&D and services contribute 40% to the total work load of SHL (excluding administration and technical services)
- Third party funding of R&D projects >70%
- R&D made an important contribution to the reputation of SHL and was a prerequisite for the MSc program



Success factors

- On site research and holistic system approach
- Scientific standards in "on site" projects
- Broad spectrum of competences under the same roof
- Project specific interdisciplinary teams (in-house and outside partners)
- Direct involvement of stakeholders in projects; constant exchange of experience researchers \leftrightarrow stakeholders
- Good network in agricultural and forestry circles (industry and policy) through project activities, alumni, previous jobs etc.
- Research results are translated to recommendations, planning aids etc
- Rapid dissemination of results through partners involved, "pilot farms", regular communication of results through whole project life cycle
- High flexibility for wishes of partners, new topics, scientific collaborators
- Open and flexible collaboration
- Highly motivated staff



Major risks and challenges

- Critical mass of research groups; long-term knowledge management
- High teaching obligations compete with research obligations (especially in (constant) periods of transition (new BSc curricula, introduction of MSc course, growing number of students). This hinders:
 - Transfer activities beyond project life cycle
 - Inauguration of new projects
- Agricultural and Forestry sector is facing difficult times → decreasing or lacking readiness to invest in research projects; other priorities
- High dependence from specific funding agencies
 - CTI in Switzerland (is strategy optimization and cost reduction eligible?; Ministry of Foreign Affairs for international projects)



The role of our status as UAS

- Optimal interface science \leftrightarrow practice
 - Scientific standards in applied "on-site research"
 - Interface basic science \leftrightarrow practice
 - Known in scientific circles and by farmers
 - Combination of thematic competences and didactic skills
- Broad competences under one roof
 - Less thematic specialisation than research stations
 - Less pronounced role of individual research groups than at universities
 - Professors with scientific and business background (science + entrepreneurship)
- Dense network
 - Project partnerships, commissions and working/expert groups etc
 - Alumni
 - International contacts



Thank you for your attention

For further information

University of Applied Sciences
Swiss College of Agriculture
Länggasse 85
CH-3052 Zollikofen
Phone 031 910 21 11

www.shl.bfh.ch