Praxishandbuch
zu Life VineAdapt – Arbeitspaket C3

Resource-efficient fertilisation methods/ Düngetechniken und Düngerarten

Kofinanziert von der Europäischen Union

Impressum und Kontakt

www.life-vineadapt.eu

Autoren:

Wilhelm Graiss, Bernhard Krautzer, Katharina Gassner-Speckmoser und Christian Redl, Karl Menhart, Sabrina Dreisiebner-Lanz, Anne Hauschild.

Kontakt:

Landesweingut Kloster Pforta GmbH, Naumburg/Saale (service@kloster-pforta.de)

HBLFA Raumberg-Gumpenstein
Abteilung für Vegetations- und Biodiversitätsmanagement
Wilhelm Graiss (wilhelm.graiss@raumberg-gumpenstein.at)

Steirisches Landesweingut Silberberg
Weinbauleiter Karl Menhart (karl.menhart@stmk.gv.at)

HBLA und BA Klosterneuburg
Christian Redl (christian.redl@weinobst.at)

Bio Ernte Steiermark, Bio-Beratung Weinbau,
Sabrina Dreisiebner-Lanz (sabrina.dreisiebner-lanz@ernte.at)

Table on contents

1. Introduction

As part of the EU-funded “Life VineAdapt” project, work package C3 dealt with the “Reduction of greenhouse gas emission in vineyards by using resource-efficient fertilization techniques”.

As part of the project, methods of fertilizer application that have not yet been tested to this extent in vineyards were investigated as a pilot project.

Over a period of 4 years, various fertilizers and fertilization techniques were examined and their influence on vine and soil health, reduction of greenhouse gas emissions and socio-economic effects were analysed. Trials were carried out on one hectare each in the Saale-Unstrut wine-growing region in Germany and in southern Styria in Austria.

Mineral and organic fertilizers were compared. One of the test tasks was to check whether 25% of the fertilizer quantity could be saved if fertilizer was applied exclusively to the under-vine area. In order to be able to compare the measured values, no fertilization measures were carried out on a control area.

2. Goal

With greenhouse gas emissions increasing worldwide every year, the aim is to identify fertilizer types, methods and techniques that can reduce emissions.

At the same time, there should be no negative impact on vine and soil health while maintaining the quality and quantity of the grape harvest. Biodiversity and socio-economic effects were also considered during the projects.

3. Practice

In the practical test, a mineral and an organic fertilizer for nitrogen were compared with each other. The mineral fertilizer ENTEC, with a nitrogen content of 26%, and sheep's wool pellets, with a nitrogen content of 11%, were used as organic fertilizers.

3.1 Preperation

Fertilization in agriculture is subject to many regulations. For example, the fertilizer requirement must be determined in advance if fertilizer is to be applied in excess of 50 kg/ha of nitrogen or 30 kg/ha of phosphorus. As a rule, a maximum of 50 kg N/ha per year may be fertilized without a soil test. More detailed information can be found in the individual federal states and the Fertilizer Ordinance.

In most areas, the fertilizer is spread with a towed fertilizer spreader. To avoid ruts, pay attention to the amount of precipitation. Soil that is too moist is unsuitable for mechanical driving.

3.2 Application

An Amazone spreader with a row spreading device was used to spread the mineral fertilizer. As the settings vary depending on the tractor and fertilizer device and have to be adjusted in each case, we will not go into further detail here.

When spreading the sheep's wool pellets, a power harrow with an APV P20 MD seed drill was used in the first attempt. In order to get the sheep's wool pellets into the understock area, the pipes of the seeder were positioned so that they protruded into the understock area. The seed drill used works electrically. The rotary harrow was not switched on and ran over the soil.

Unfortunately, the sheep's wool pellets could not be spread in this way. The pellets were too large, causing the pipes to clog. In the course of the trial, the pellets were therefore spread by hand in the understock area.

Fertilizer spreaders with an integrated conveyor belt are useful for spreading pellets. Such a spreader was not available for the trials.

Depending on the size of the area, pellets can be spread by hand in the understock area.

4. Project outcomes

With regard to the nitrogen content in the soil, it was found that each fertilization always leads to a measurable increase in nitrogen content and minerals. In all trials, there was no significant difference between the parameters grape quality and grape quantity. Likewise, nitrogen fertilization has no significant influence on sugar storage in the berries.

Sheep's wool pellets cannot be worked into the soil in the under-vine area, or only with great effort. They lie on the ground and may hinder mechanical understock cultivation. The extent to which pellets disturb the growth in the understock area has not been investigated.

Organic fertilizers are considerably more expensive than mineral fertilizers. Depending on the manufacturer, there is a difference of five to seven euros per kilogram between the fertilizer types.

The fertilizer trials showed that organic fertilizers have no negative influence on the nitrogen content in the soil. Organic fertilizers release nitrogen to the same extent as synthetic fertilizers.

It was found that fertilizing the understock area with sheep's wool pellets only requires 75% of the total amount needed. The financial advantage of synthetic fertilizer can be reduced by saving on the total fertilizer quantity.

5. Benefits of organic fertilizer

The use of organic fertilizers offers many benefits for the environment and makes a significant contribution to sustainability in vineyards. Organic fertilization is in harmony with biodiversity, promotes humus formation and increases soil activity. At the same time, it supports the regional circular economy and nutrient recycling - key aspects for maintaining healthy and resilient ecosystems in the long term.

The project showed that fertilizing with 75% of the total amount required achieves similar effects to the conventional application of 100% of the fertilizer amount. This approach makes it possible to save on the total amount of fertilizer without compromising the positive effects on the soil. In addition, this method leads to a reduction in greenhouse gas emissions for the same amount of work, which is another important contribution to climate protection.

Although organic fertilizer is more expensive to purchase than mineral fertilizer, this cost factor is more than offset by the ecological benefits. The benefits for the

environment - particularly in terms of humus formation, biodiversity and the reduction of greenhouse gases - make the use of organic fertilizers an acceptable and forward-looking solution.

In conclusion, it can be said that the combination of organic fertilizer and selective fertilization in the under-vine area promotes sustainable vineyard management. This integrative approach is a promising strategy to reduce the ecological footprint in agriculture while sustainably improving soil quality and biodiversity.

Adapting the type and method of fertilizer makes it possible to work in a way that conserves resources, which is economically advantageous in the long term. We therefore recommend relying on organic fertilizers and, if technically possible, only fertilizing the understock area - ideally with a 25% reduction in the amount of fertilizer.