ᐊᖑᓇᓱᒃᓗᓂ ᐊᑦᑕᓇᕐᑐᒦᓐᓂᖕᒋᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᕐᓂᒃ

07 ᔫᓂ 2019

ᑎᑎᕋᕐᑕᖕᒋᑦ ᐅᑯᐊ: ᐃᐅᓇᒃ ᓇᒡᒍᕐ (ᓯᓚᑦᑐᓴᕐᕕᒃᔪᐊᖅ ᕗᐊᓱᖕᑕᓐᒥ) ᐊᒻᒪᓗ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᓂ ᓇᓄᕐᓂᒃ ᑲᒪᔾᔪᑎᓂᒃ ᐱᓕᕆᐊᓖᑦ (ᒫᑲᔅ ᑎᒃ, ᒍᓇᒡᒍᕐ ᒋᐅᑦᐳᕐᑦ, ᓵᒥᐅᑦ ᐊᐃᕗᓴᓐ, ᑏᕙᑦ ᓖ, ᓂᑯᓚᔅ ᓚᓐ, ᔫᓱᕝ ᓄᐊᕐᑐᕌᑉ, ᐋᓚᓐ ᐱᓐ, ᒪᓈᒃᑉᓘᑦ ᓇᑦᓱᕐ, ᐊᒻᒪᓗ ᒋᓚᐆᑉ ᓱᐊᕐ)

ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᑲᒪᔾᔪᑎᓂᒃ ᐱᓕᕆᐊᓖᑦ (TWG) ᐋᕿᑦᑕᐅᓚᐅᕐᑐᑦ ᐱᑕᖃᒃᑲᐃᓪᓗᑎᒃ ᐅᖃᐅᔾᔨᒋᐊᕈᑎᓂᒃ ᐱᓪᓗᒋᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᕐᓂᒃ ᓇᓄᖃᐅᕐᑐᓂ ᖃᐅᔨᒪᔨᑦ ᑲᑎᒪᔨᕋᓛᑦ. ᐅᑯᐊ TWG ᒫᓐᓇᕈᓗᒃ ᑲᑎᕐᓱᐃᓚᐅᕐᑐᑦ ᐊᑐᐃᓐᓇᕐᓂᒃ ᖃᐅᔨᓴᕐᑎᒻᒪᓈᑦ ᑎᑎᕋᕐᓯᒪᔭᖕᒋᓐᓂᒃ ᐱᓪᓗᒋᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ (SH) ᓇᓄᖃᐅᕐᑐᒥ, ᓇᐃᓈᕐᑐᒋᑦ ᖃᐅᔨᒪᓇᕐᑐᒥᒃ ᐃᓚᙵᐃᔭᐃᒍᑏᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖕᒋᑦ, ᐱᓕᕆᖃᑎᖃᕐᑐᑎᒃ ᓯᓚᑖᓂᒃ ᖃᐅᔨᒪᔪᓴᒪᕆᒥᒃ ᐋᕿᓱᕐᑐᒋᑦ ᖃᓄᐃᓕᖓᓂᖕᒋᓐᓂᒃ ᐆᑦᑐᕋᐅᑏᑦ, ᑲᒪᒋᓪᓗᒍ ᐊᖑᓇᓱᒃᓗᓂ ᐊᑦᑕᓇᕐᑐᒦᓐᓂᖕᒋᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ, ᐊᒻᒪᓗ ᑎᑎᕋᕐᑐᒋᑦ ᑖᒃᑯᐊ ᑭᖑᓕᕆᒥᒃ ᐱᓕᕆᐊᑦᓴᑦ ᒫᓐᓇ ᐅᓂᒃᑳᓂ ᐅᑯᓄᖓ ᖃᐅᔨᒪᔨᑦ ᑲᑎᒪᔨᕋᓛᑦ. ᐃᓛᒃ ᖃᐅᔨᓴᕐᓂᖅ ᑐᙵᕕᖃᓪᓗᐊᓚᐅᕐᑑᒐᓗᐊᖅ ᖃᐅᔨᓴᕐᑎᒻᒪᓇᓐᓂᒃ ᑐᓴᕋᓴᓂᒃ, ᓄᓇᖃᖅᑳᕐᓂᑯᑦ ᖃᐅᔨᒪᓂᖕᒋᑦ ᐃᓱᒪᒋᔭᐅᓚᐅᕐᑐᑦ ᑐᑭᑖᕐᑎᒐᓱᐊᕐᑐᒋᑦ ᐊᒻᒪᓗ ᐆᑦᑐᕋᐅᑎᒋᓪᓗᒋᑦ ᖃᓄᐃᓕᕐᓂᖕᒋᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑐᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᐃᑦ. ᐅᑯᐊ TWG ᐃᒪᐃᑦᑑᖕᒋᑦᑐᑦ ᐃᓱᒪᓕᐅᕈᒻᒥᒃ–ᐋᕿᑦᓱᐃᔨᑦ ᑎᒥᖕᒋᑦ. ᐃᒪᐃᑦᑐᓪᓕ, ᐱᒐᓱᐊᕐᕕᖃᓚᐅᕐᑐᑦ ᖃᐅᔨᒪᓂᖕᒋᓐᓂᒃ ᑖᒃᑯᓇᓂ ᐃᓚᐅᔪᓄᑦ ᐋᕿᓱᕐᑐᒋᑦ ᐊᒻᒪᓗ ᑐᓂᓪᓗᒋᑦ ᐅᖃᐅᔾᔨᒋᐊᕈᑏᑦ ᐃᐸᐱᒋᔭᓕᓐᓄᑦ ᐃᓱᒪᓕᐅᕈᑎᓂᒃ–ᐋᕿᑦᓱᐃᓂᕐᒧᑦ ᑎᒥᐅᔪᓄᑦ ᐱᓪᓗᒋᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᐃᑦ.

ᐅᑯᐊ ᐅᓂᒃᑳᑦ ᐱᑕᖃᒃᑲᐃᔪᑦ ᐆᑦᑐᑦᑕᐅᒍᓐᓇᕐᑐᓂᒃ ᐊᖑᓇᓱᒃᓗᓂ ᐊᑦᑕᓇᕐᑐᒦᓐᓂᖕᒋᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᒫᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐃᔭᐅᕐᔪᐊᖓᑕ ᓂᒋᐊᓂ ᓇᓄᕐᓂᒃ ᓇᓄᖃᐅᕐᑐᓂ. ᑭᖑᓪᓕᕐᔫᑦ ᖃᐅᔨᔭᑦ ᐃᒪᐃᑦᑐᑦ ᐊᒥᓱᑦ ᐱᑕᖃᑭᓐᓇᕐᑐᑦ ᐊᖑᓇᓱᒃᓗᓂ ᑲᒪᔾᔪᑏᑦ ᐃᒫᒃ ᑐᑭᓯᐅᒪᓗᓂ ᐱᑕᖃᑐᐃᓐᓇᕆᐊᓕᓐᓂᒃ ᐊᐅᓚᕐᓯᓂᕐᒧᑦ ᑲᒪᒋᔭᓂᒃ ᐊᑕᐅᕐᓯᒃᑰᖃᑕᐅᓗᑎᒃ ᐊᓯᖕᒋᓐᓄᑦ ᐱᕕᓴᓄᑦ ᑐᓴᕋᓴᓂᒃ ᐊᒻᒪᓗ ᐃᓱᒪᒋᔭᕆᐊᓕᓐᓂᒃ. ᖃᐅᔨᓴᕐᓂᖅ ᐊᑐᕐᑐᖅ ᐋᕿᓱᕐᑕᐅᒪᔪᓂᒃ ᖃᓄᐃᓕᖓᓂᖕᒋᓐᓂᒃ ᐆᑦᑐᕋᐅᑏᑦ ᐋᕿᓱᕐᑕᐅᓚᐅᕐᑐᖅ ᕿᒥᒃᑐᓪᓗᒋᑦ ᑭᐅᔾᔪᑏᑦ ᐊᔾᔨᒌᙱᑦᑐᓂ ᐊᕙᑖᑕ ᖃᓄᐃᓕᖓᓂᖕᒋᓐᓂᒃ ᐊᒻᒪᓗ ᐊᐅᓚᕐᓯᓂᕐᒧᑦ ᑲᒪᒋᔭᐅᓕᕐᑐᓂᒃ. ᐱᑕᖃᕐᑐᑦ ᑲᒪᒋᔭᐅᓂᖕᒋᑦ ᐱᑕᖃᕐᑎᕐᓯᔪᑦ ᐃᒻᒥᒃᑰᖓᔪᓂᒃ ᑎᑎᕋᕐᓯᒪᔪᓂᒃ ᐋᕿᓱᕐᓯᒪᔪᑦ ᖃᐅᔨᓴᓱᐊᕈᑏᑦ, ᑖᒃᑯᐊ ᐊᒥᓱᓄᑦ ᐊᑐᕐᑕᑦ ᐆᒪᔪᓕᕆᓂᕐᒧᑦ. ᐆᑦᑐᕋᐅᑦ ᐃᓚᖃᕐᑐᖅ ᑕᐃᒪᐃᓪᓗᐊᖃᑎᒌᓂᒃ ᐊᒡᕋᒍᓕᓐᓂᒃ ᐊᒻᒪᓗ ᐊᑐᕐᑕᖅ ᐊᕐᓇᓗᓐᓄᑦ ᓇᓄᕐᓄᑦ ᑭᓯᐊᓂ. ᑖᓐᓇ ᑲᒪᒍᓱᐅᔪᖅ ᐃᓚᖃᕐᑐᖅ ᖃᑕᖑᑎᒌᙱᑦᑐᑦ ᐃᓚᒌᓐᓂᖕᒋᓐᓂᒃ ᑕᒪᒃᑯᓇᓂ ᐱᑕᖃᕐᑐᓂ ᖃᓂᒌᑦᑑᑕᐅᓂᖕᒋᓐᓂᒃ ᐊᒻᒪᓗ ᐱᑕᖃᕐᑐᑦ ᐊᒥᓱᕈᕐᐸᓪᓕᐊᓂᖕᒋᓐᓂᒃ ᐊᓚᒃᑲᕈᑕᐅᔪᑦ ᖃᓄᐃᓕᖓᓂᖕᒋᓐᓄᑦ ᐱᐅᓯᖕᒋᓐᓂᒃ ᐃᒫᒃ ᒫᓃᒐᔪᑦᑐᑦ ᐃᓗᐊᓂ ᑭᓪᓕᖕᒋᑕ ᑕᒪᒃᑯᐊ ᑎᑎᕋᕐᑕᐅᒪᔪᑦ ᓇᓄᐃᑦ ᐊᒻᒪᓗ ᐊᔾᔨᒐᓚᖕᒋᑦ ᐆᒪᔪᑦ. ᐆᑦᑐᕋᐅᑦ ᐃᓚᐅᑎᕐᓯᒍᓐᓇᕐᑐᖅ ᐱᑕᖃᑐᐃᓐᓇᕆᐊᓕᓐᓂᒃ ᓇᔪᒐᐃᑦ ᐊᓯᔾᔨᕐᓂᖕᒋᓐᓂᒃ ᑕᒪᒃᑭᓐᓂ ᖃᓂᒌᑦᑑᑕᐅᓂᖕᒋᑦ–ᐊᑐᕐᑐᑦ ᑲᒪᒍᓱᐅᔪᓂᒃ (ᓱᕐᓗ, ᐊᓯᔾᔨᕐᐸᑦ ᐊᕙᑖ

ᐱᑕᖃᕈᓐᓇᕐᓂᖓᑕ [K]) ᐊᒻᒪᓗ ᖃᓂᑏᑦᑑᑕᐅᓂᖏᑦ–ᐃᒻᒥᒃᑯᖓᔪᑦ ᑲᒪᒍᓯᐅᔪᓂ(ᓲᕐᓗ, ᐊᓯᔾᔨᐸᓪᓕᐊᔪᖅ ᐊᒥᓲᓂᕐᐹᓂᒃ ᐱᐅᓯᕐᒥᒍᑦ ᐊᒥᓱᕈᕐᐸᓪᓕᐊᓂᖏᑕ ᐊᑯᓚᐃᓐᓂᖏᑦ [r_{max}]).

ᒥᒃᓴᐅᓴᓚᐅᕐᑐᒍᑦ ᑭᓪᓕᖏᓐᓂᒃ ᐋᕿᓱᕐᓯᒪᔪᑦ ᖃᐅᔨᒐᓱᐊᕈᑏᑦ ᐊᑐᕐᑐᒋᑦ Bayesian Monte Carlo ᑲᒪᒍᓯᐅᖏᑦ ᐱᑕᖃᕐᑐᓂᒃ ᐋᕿᑦᓱᐃᒋᐊᒃᑲᓂᕐᑐᓂ. ᑖᓐᓇ ᑲᒪᒍᓯᐅᔪᖅ ᐊᑐᕐᑕᖅ ᒥᒃᓴᐅᓴᕐᑐᒋᑦ ᖃᓄᐃᓪᓗᐊᓂᖏᑦ ᐊᒻᒪᓗ ᐱᑕᖃᕐᑐᑦ ᐊᒥᓱᕈᕐᐸᓪᓕᐊᓂᖏᑕ ᐊᑯᓚᐃᓐᓂᖏᑦ ᑲᒪᒋᔭᐅᓂᑯᓂᒃ–ᑕᑯᔭᐅᒃᑲᓂᕐᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᒃᑯᑦ ᑖᕙᓂ 1980ᑦ ᐊᒻᒪᓗ 2000ᑦ (Obbard ᐊᓯᖏᓪᓗ 2007), ᒥᒃᓴᐅᓴᒍᑏᑦ ᖃᓄᐃᓪᓗᐊᓂᖏᓐᓂᒃ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᒃᑯᑦ 2010ᓂ (Obbard ᐊᓯᖏᓪᓗ 2015, 2018) ᐊᒻᒪᓗ ᐊᖑᑕᐅᔪᓄᑦ ᓈᓴᐅᑏᑦ ᒫᓂ ᓄᓇᕗᑦ, ᑯᐱᐊᒃ, ᐊᒻᒪᓗ ᐊᓐᑎᐅᕆᐅ. ᐊᔪᖏᒍᑕᐅᓚᐅᕐᒥᔪᖅ ᐃᓚᒋᓕᐅᑎᓪᓗᒋᑦ ᓯᕗᓪᓕᕐᒥᒃ ᑐᓴᕋᕐᓴᑦ ᐊᓯᖏᓐᓂᒃ ᑲᒪᒋᔭᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᓂᒃ ᓇᓄᕐᓂᒃ. ᐱᑕᖃᕐᑐᑦ ᐋᕿᓱᕐᑕᐅᑲᓐᓂᕐᓂᖏᑦ ᐊᓚᒃᑲᐃᔪᑦ ᐃᒫᒃ ᓇᒦᓐᓂᖏᓐᓂᒃ ᐆᑦᑐᕋᐅᑦ ᐊᓚᒃᑲᐃᕐᑲᑲᓐᓂᕈᓐᓇᕐᒪᑦ ᓯᓕᔪᕐᓇᕐᑐᓂᒃ ᐊᓯᔾᔨᑕᕐᓂᖏᓐᓂᒃ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᓂ ᓇᓄᕐᑲᐅᕐᑐᓂᒃ ᐊᓂᒍᕐᑲᑖᓂ ᐊᒃᕋᒍᒐᓴᓐᓂ.

ᐊᑐᐃᓐᓇᐃᑦ ᑎᑎᕋᕐᓯᒪᔪᑦ ᖃᐅᔨᒍᑕᐅᖏᑦᑐᑦ ᐱᓪᓗᒋᑦ ᒫᓐᓇ ᓇᒦᓐᓂᖏᓐᓄᑦ ᖃᓄᐃᓕᕐᓂᖏᓐᓂᒃ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᕐᑲᐅᕐᑐᓂ. ᓈᓴᐅᑎᑎᒍᑦ ᓇᓗᓇᕐᓂᖏᑦ ᐊᒻᒪᓗ ᑲᒪᒍᔪᐅᔪᑦ ᐊᔾᔨᒌᖏᓐᓂᖏᑦ ᒪᑯᓇᓂ ᑲᒪᒋᔭᐅᓂᑯᑦ–ᑕᑯᔭᐅᒃᑲᓂᕐᑐᑦ ᖃᐅᔨᓴᕐᑐᒋᑦ ᐊᒻᒪᓗ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ ᐊᔪᕈᑕᐅᒻᒪᑕ ᒥᒃᓴᐅᓴᓪᓗᓂ ᐊᑯᓂᐅᔪᒥᒃ ᐊᓯᔾᔨᑕᕐᓂᖏᓐᓂᒃ ᖃᑦᓯᐅᓂᖏᑕ. ᐊᒥᓱᑦ ᓇᓗᓇᖏᒍᑏᑦ ᓇᓗᓇᐃᕐᓯᔪᑦ ᐃᒫᒃ ᓇᓄᕐᑲᐅᕐᑐᑦ ᐃᒪᐃᓚᐅᕐᒪᑦ, ᕿᑎᖓᓃᑦᑐᒍ, ᐊᔪᖏᒍᑕᐅᔪᖅ ᐊᖏᔪᒥᒃ ᐊᒥᓱᕈᕐᐸᓕᕐᓂᖏᓐᓂᒃ ᓇᓪᓕᐅᓯᒪᔪᒥ 1984-2016 ᐊᒻᒪᓗ ᑕᐃᒪ ᐃᑲᔪᕈᓐᓇᕐᑐᖅ ᐊᒥᓱᕈᕆᐊᕐᓗᒋᑦ ᐊᖑᓇᓱᒐᕐᓴᑦ. ᑭᓯᐊᓂ, ᐱᑕᖃᕐᒥᔪᖅ ᓇᓗᓇᖏᒍᒻᒥᒃ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᕐᓂᖏᓐᓂᒃ ᐅᕙᖓᑦ 943 ᓇᓄᐃᑦ 2012ᒥ (Obbard ᐊᓯᖏᓪᓗ 2015) ᐅᕗᖓ 780 ᓇᓄᐃᑦ 2016ᒥ (Obbard ᐊᓯᖏᓪᓗ 2018) ᑐᖓᕕᒋᓪᓗᒋᑦ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ ᐊᔾᔨᒌᒥᒃ ᑲᒪᒍᓯᖃᕐᑐᓂ. ᓯᑯ ᒥᑭᓪᓕᕙᓪᓕᕐᓯᒪᓕᕐᒪᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᐊᐅᓚᑦᓯᖓᕕᐅᔪᒥ, ᐃᓛᒃ ᒥᑭᓂᕐᓴᐅᓚᓗᐊᖅ ᐃᒫᒃ ᐊᓯᖏᑦ ᓇᓄᕐᓂᒃ ᐊᐅᓚᑦᓯᖓᕕᐅᔪᑦ ᓇᓕᖏᑦ (Stern ᐊᒻᒪᓗ Laidre 2016), ᐊᒻᒪᓗ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᕐᑲᐅᕐᑐᑦ ᖃᐅᔨᓇᕐᓯᒪᒻᒪᑦ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᕆᐊᖏᑦ ᓂᕿᑦᓯᐊᕙᐃᑦ (Obbard ᐊᓯᖏᓪᓗ 2016). ᖃᓂᒋᔭᖓᓂ ᐱᖓᓐᓇᖓᑕ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᓂ (WH) ᓇᓄᕐᑲᐅᕐᑐᒥ, ᐊᔾᔨᒐᓚᖏᑦ ᐱᐅᖏᓕᕙᓪᓕᕈᑏᑦ ᑎᒥᖏᓐᓄᑦ ᖃᐅᔨᓇᓚᐅᕐᑐᑦ ᓯᕗᕐᖓᒍᑦ ᐱᒐᓱᐊᕐᓂᐅᑉ ᓇᓗᓇᖏᒍᑎᓂᒃ ᒪᑯᓇᖓᑦ ᑲᒪᒋᔭᐅᓂᑯᑦ–ᑕᑯᔭᐅᒃᑲᓂᕐᑐᑦ ᖃᐃᔨᓴᕐᑐᒋᑦ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᕆᐊᖏᑦ ᕿᑐᕐᖏᐅᕐᓂᖏᑦ, ᐃᓈᒍᓐᓇᕐᓂᖏᑦ, ᐊᒻᒪᓗ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᑦ (Lunn ᐊᓯᖏᓪᓗ 2016). ᒫᓐᓇᕈᓗᒃ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ ᐱᖓᓐᓇᖓᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᕐᑲᐅᕐᑐᒥ ᓇᓗᓇᐃᕐᓯᔪᑦ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᕆᐊᖏᑦ ᖃᑦᓯᐅᓂᖏᑦ ᓇᓪᓕᐅᓯᒪᔪᒥ 2011-2016 ᑐᖓᕕᒋᓪᓗᒋᑦ ᐊᒥᓱᑦ ᓇᓗᓇᖏᒍᑏᑦ, ᐃᓈᒃ ᐊᔾᔨᒌᖏᒍᑏᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᓐᓄᑦ ᒥᒃᓴᐅᓴᒍᑎᓄᑦ ᓈᓴᐅᑎᑎᒍᑦ ᐊᓚᒃᑲᓚᐅᖏᑦᑑᓗᓗᐊᑦ (Stapleton ᐊᓯᖏᓪᓗ 2014; ᑎᒃ ᐊᓯᖏᓪᓗ 2017).

ᐃᓱᒪᒋᓚᐅᕐᑕᕗᑦ ᓇᓗᓇᕐᓂᖏᑦ ᒫᓐᓇ ᐊᒻᒪᓗ ᓯᕗᓂᑦᑎᓐᓂ ᖃᓄᐃᓕᕐᓂᖏᓐᓂᒃ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓂᒋᐊᓂ ᓇᓄᕐᑲᐅᕐᑐᒥ ᐋᕿᓱᕐᑐᒋᑦ ᐱᖓᓱᑦ ᐆᒪᔫᓂᖏᓐᓄᑦ ᑕᑯᓐᓇᕐᑕᐅᖑᐊᕐᑐᑦ ᐱᑕᖃᕈᑕᐅᔪᑦ ᓱᓕᔪᕐᓇᕐᑐᓄᑦ ᐅᐸᒐᖏᑕ ᖃᓄᐃᓕᕐᓂᖏᓐᓄᑦ, ᐅᕙᖓᑦ ᐱᐅᔪᖅ ᐅᕗᖓ ᐱᐅᖏᑦᑐᖅ, ᑐᖓᕕᒋᓪᓗᒋᑦ ᐊᑐᐃᓐᓇᐃᑦ

ᐊᖓᔪᖃᐅᑏᑦ ᓇᐃᓈᕈᑎᖕᒋᑦ

ᖃᐅᔨᓴᕐᑎᒻᒪᓇᑦ ᑎᑎᖅᑲᖕᒋᑦ ᐊᒻᒪᓗ ᑎᑎᕋᕐᑕᐅᒪᔪᑦ ᓄᓇᖃᖅᑳᕐᓂᑯᑦ ᖃᐅᔨᒪᓂᖕᒋᑦ. ᑕᑯᓐᓇᖕᒍᐊᕐᑕᑦ ᐋᕿᓱᕐᑕᐅᓚᐅᕐᑐᑦ ᐊᑐᕐᑐᒋᑦ ᐊᔾᔨᒌᖕᒋᑦᑐᑦ ᑲᒪᒍᓯᐅᔪᑦ ᐱᑕᖃᕐᑐᓂᒃ ᐋᕿᑦᓱᐃᒃᑲᓂᕐᓂᕐᒧᑦ ᐊᒻᒪᓗ ᐊᓯᔾᒌᖕᒋᑦᑐᑦ ᐃᓱᒪᒋᔭᑦ ᐱᓪᓗᒋᑦ ᓯᕗᓂᑦᑎᓐᓂ ᐊᑦᑐᐃᓂᖕᒋᑦ ᓇᔪᒐᐃᑦ ᐊᓯᐅᔨᔭᑦ. ᑕᑯᓐᓇᖕᒍᐊᕐᑕᖅ 1 ᐊᓚᒃᑲᐃᔪᖅ ᐱᐅᔪᒥᒃ ᒥᒃᓴᐅᓴᒍᒻᒥᒃ ᐃᒫᒃ ᓯᕗᓂᑦᑎᓐᓂ ᐊᔾᔨᒋᒐᓚᓐᓂᐊᕐᒪᐅᒃ ᐊᓂᒍᕐᑐᑦ 30 ᐊᒃᕋᒍᑦ, ᐱᑕᖃᑐᐃᓐᓇᕐᓗᓂ ᓱᒃᑲᐃᑦᑐᒥᒃ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐊᓂᖕᒋᑦ ᒫᓂ *K* ᐃᓱᒪᒋᓗᒋᑦ ᒥᒃᓴᐅᓴᒍᑏᑦ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐊᓂᖕᒋᓐᓂᒃ ᖃᑦᓯᐅᓂᖕᒋᑕ ᓯᑯᓯᒪᕙᑦᑐᑦ ᐅᓪᓗᐃᑦ ᐊᒃᕋᒍᒥ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᐊᐅᓚᑦᓱᒃᕕᐅᔪᒥ. ᑕᑯᓐᓇᖕᒍᐊᕐᑕᖅ 2 ᐊᓚᒃᑲᐃᔪᖅ ᕿᑎᖓᓃᑦᑐᒥᒃ ᒥᒃᓴᐅᓴᒍᒻᒥᒃ ᐃᒫᒃ ᓯᕗᓂᑦᑎᓐᓂ ᐊᔾᔨᒋᒐᓚᓐᓂᐊᕐᒪᐅᒃ ᐊᓂᒍᕐᑐᑦ ᖁᓛᑦ ᐊᒃᕋᒍᑦ, ᑕᒪᓂ ᐱᑕᖃᕐᒪᑦ ᓇᓗᓇᖕᒋᒍᑎᓂᒃ ᓇᒦᓐᓂᖕᒋᑕᑦ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐅᕐᑐᓂᒃ, ᐊᒻᒪᓗ ᐃᒫᒃ ᑕᒪᒃᑮᑦ *K* ᐊᒻᒪᓗ r_{max} ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐊᓚᖓᒻᒪᑕ ᓱᒃᑲᐃᑦᑐᒥᒃ ᓯᕗᓂᑦᑎᓐᓂ. ᑕᑯᓐᓇᖕᒍᐊᕐᑕᖅ 3 ᐱᑕᓕᒃ ᒪᒃᑮᓐᓂᒃ ᐱᐅᖕᒋᑦᑑᓐᓂᒃ ᐱᑕᖃᕐᑐᓂᒃ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᓂ ᓇᓄᖃᐅᕐᑐᒥ. ᑕᑯᓐᓇᖕᒍᐊᕐᑕᖅ 3a ᐃᓚᖃᕐᑐᖅ ᐊᖏᔪᒥ ᖃᓂᑏᑦᑑᑕᐅᓂᖕᒋᑕ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐊᓂᖕᒋᑦ ᒫᓂ r_{max} ᑭᖑᓕᖃᕐᑐᒍ ᓱᒃᑲᐃᑦᑐᒥᒃ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐊᓂᖕᒋᑦ ᑕᒪᒃᑭᓐᓂ *K* ᐊᒻᒪᓗ r_{max}. ᑕᑯᓐᓇᖕᒍᐊᕐᑕᖅ 3b ᐊᓚᒃᑲᐃᔪᖅ ᓇᓄᖃᐅᕐᑐᓂ ᐃᒫᒃ ᐃᓱᒪᒋᔭᐅᓪᓗᓂ ᐊᔪᖕᒋᒋᐊᖕᒋᑦ ᐊᖏᔪᒥᒃ ᐊᒥᓱᕈᕐᐸᓪᓕᐊᓂᖕᒋᑦ ᑭᓯᐊᓂ ᐊᑐᕐᑐᑎᒃ ᓴᑲᑦᑐᒥᒃ ᐊᒻᒪᓗ ᑐᑭᓕᐊᖕᒋᑐᒥᓂᒃ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐊᓂᖕᒋᑦ ᒫᓂ *K*.

ᐊᑐᓂᑦ ᐆᒪᔫᓂᖕᒋᓐᓂᒃ ᑕᑯᓐᓇᖕᒍᐊᕈᑏᑦ, ᐊᑐᓚᐅᕐᑐᒍᑦ ᓇᒦᓐᓂᖕᒋᓐᓂᒃ ᐆᑦᑐᕋᐅᒻᒥᒃ ᐊᓚᒃᑲᕐᑐᒋᑦ ᐆᑦᑐᕋᐅᑏᑦ ᓇᓄᖃᐅᕐᑐᓂ ᓯᕗᒧᑦ ᑕᒫᓂ ᐃᓱᒪᒋᓪᓗᒋᑦ ᐊᒥᓱᑦ ᐊᕐᓇᕐᓗᐃᑦ ᐊᖑᑕᐅᕙᑦᑐᑦ ᐊᑯᓚᐃᓐᓂᖕᒋᑦ. ᒥᒃᓴᐅᓴᒍᑏᑦ ᑲᒪᒋᔭᐅᓚᐅᕐᑐᑦ 35ᓄᑦ ᐊᒃᕋᒍᓄᑦ, ᑕᒪᓐᓇ ᐊᔾᔨᒌᓚᖓ ᐃᒫᓪᓗᐊᒐᓚᒃ ᐱᖓᓱᑦ ᓇᓄᕐᓄᑦ ᐊᒃᕋᒍᖃᑎᒌᓄᑦ ᐊᒻᒪᓗ ᐱᑕᖃᕋᔪᕐᑐᖅ ᐱᕕᓴᐅᔪᒥᒃ ᐱᓗᐊᑦᑕᐃᓕᓂᕐᒥᒃ ᖃᐅᔨᓴᕐᓗᓂ (Regehr ᐊᓯᖏᓪᓗ 2016). ᖃᒥᒃᑭᓚᐅᕐᑐᒍᑦ ᐊᑦᑐᐃᓂᖕᒋᓐᓂᒃ ᐊᖑᑕᐅᔪᑦ ᑕᒫᓂ ᐱᖓᓱᓂ ᐱᑕᖃᕈᓐᓇᕐᑐᓂ ᐊᓯᐊᒎᕈᑎᓂ ᓇᓄᖃᐅᕐᑐᓂᒃ ᐊᐅᓚᑦᓱᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᓂᒃ: (1) ᓱᒃᑲᖕᒋᓪᓗᒋᑦ ᓇᓄᖃᐅᕐᑐᓂ ᐊᒥᓲᓂᖕᒋᑦ ᐃᒫᒃ ᑎᑭᒍᑕᐅᔪᑦ ᐊᒥᓲᓂᕐᐸᓂᒃ ᓄᖑᑦᓯᕙᓪᓕᐊᓕᖕᒋᓪᓗᓂ ᐱᔭᐅᒍᓐᓇᕐᑐᓂᒃ, ᐱᓪᓗᒋᑦ ᐱᑕᖃᑐᐃᓐᓇᕆᐊᓖᑦ ᐊᓯᔾᔨᕐᓂᖕᒋᑦ ᖃᑦᓯᐅᓂᖕᒋᑦ; (2) ᓱᒃᑲᖕᒋᓪᓗᒋᑦ ᓱᒃᑲᐸᓪᓕᐊᖕᒋᑦᑐᑦ ᓇᓄᖃᐅᕐᑐᓂ ᖃᑦᓯᐅᓂᖕᒋᑦ; ᐊᒻᒪᓗ (3) ᓱᒃᑲᖕᒋᓪᓗᒋᑦ ᓇᓄᖃᐅᕐᑐᓂ ᖃᑦᓯᐅᓂᖕᒋᑦ ᐊᒥᓲᓂᕐᓴᑦ ᐃᓄᐃᓴᓐᓂᕐᐸᓂ ᐱᒋᐊᕈᑕᐅᔪᑦ, ᐃᓄᐃᓴᓐᓂᕐᓴᑦ ᑖᒃᑯᐊ ᐊᐅᓚᓂᖕᒋᑦ ᐊᒻᒪᓗ ᐊᔪᖕᒋᓐᓂᖕᒋᑦ ᓇᓄᖃᐅᕐᑐᓂ ᓈᒻᒪᒍᓐᓃᕈᑕᐅᒐᔭᕐᑐᑦ. ᐊᐅᓚᑦᓱᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᖅ 3 ᐱᐅᓯᖃᕋᓱᐊᖕᒋᑦᑐᖅ ᐆᑦᑐᕈᑕᐅᓗᓂᒥ ᓄᖑᑦᓯᕙᓪᓕᐊᖕᒋᓪᓗᓂ, ᑭᓯᐊᓂ ᓇᓗᓇᐃᕐᓗᒍ ᑕᒫᓂ ᓇᓄᖃᐅᕐᑐᓂ ᓄᖑᒐᔭᕆᐊᖕᒋᑕ ᑎᑭᐅᑎᓗᒍ ᐃᒫᒃ ᑐᐊᕕᕐᓇᕐᑐᒥᒃ ᐊᐅᓚᑦᓂᕐᒧᑦ ᑲᒪᒍᓯᐅᔪᑦ ᐱᑕᖃᕆᐊᖃᓕᕐᓗᑎᒃ. ᐱᑕᖃᕐᑎᑉᐸᕗᑦ ᐱᑕᖃᑐᐃᓐᓇᕆᐊᓖᑦ ᑎᑭᒐᓱᐊᕐᓗᒋᑦ ᐱᖓᓱᑦ ᐊᐅᓚᑦᓱᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᑦ ᐊᒥᓱᓂ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ ᑲᒪᔾᔪᑎᐅᔪᓂ, ᐃᒪᐃᖕᒋᖕᒐᕐᓗᒍ ᑐᓂᑐᐃᓐᓇᕐᓗᒋᑦ ᖃᐅᔨᔭᑦ ᐃᓄᐃᓴᓐᓂᕐᓴᓂᒃ ᐊᖑᓇᓱᒐᕐᓴᓂᒃ ᑲᒪᔾᔪᑎᐅᔪᑦ ᒪᓕᑐᐃᓐᓇᕐᑐᑦ ᐃᓱᒪᒋᔭᐅᓂᑯᓂᒃ ᖃᓄᐃᓪᓗᐊᕐᓂᖕᒋᓐᓂᒃ ᐅᓗᕆᐊᓇᕈᑏᑦ (ᓲᕐᓗ, ᒪᓕᑐᐃᓐᓇᕐᑐᑦ ᓇᓗᓇᐃᕐᑕᓂᒃ ᐱᑕᖃᑐᐃᓐᓇᕆᐊᓕᓐᓂᒃ ᐱᔭᕇᕐᓗᖕᒋᑦ ᑐᕋᒐᐅᔪᑦ).

ᐊᔾᔨᓯᐅᕈᓐᓇᕐᑕᕗᑦ ᖃᐅᔨᔭᑦ ᐱᖓᓱᓂ ᐆᒪᔫᓂᖕᒋᓐᓂᒃ ᑕᑯᓐᓇᖕᒍᐊᕐᑕᓂ ᑕᑯᓐᓇᕐᓗᒋᑦ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ ᑲᒪᔾᔪᑎᐅᔪᑦ ᐱᑕᓖᑦ 80% ᐱᑕᖃᑐᐃᓐᓇᕆᐊᓕᒻᒥᒃ ᐱᔭᕇᕐᓗᒍ ᐊᐅᓚᑦᓱᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᖅ 1 (ᓲᕐᓗ, ᑐᒃᑲᖕᒋᓪᓗᒋᑦ ᓇᓄᓇᐅᕐᑐᓂᒃ ᖃᑦᓯᐅᓂᖕᒋᑦ ᑎᑭᒍᑕᐅᔪᑦ ᐊᒥᓲᓂᕐᐸᓂᒃ ᓄᖑᑦᓯᕙᓪᓕᐊᖕᒋᓪᓗᓂ ᐱᔭᐅᒍᓐᓇᕐᑐᑦ). ᐊᐅᓚᑦᓱᓂᕐᒧᑦ

ᐊᖓᔪᖅᑲᐅᑏᑦ ᓇᐃᓈᕈᑎᖏᑦ

ᑐᕋᒐᐅᔪᖅ 1 ᓈᒻᒪᑦᓯᐊᕐᑐᖅ ᐃᓪᓗᒋᓕᕐᑎᓪᓗᒋᑦ ᓇᓄᖅᑲᐅᕐᑐᓂ ᓴᐳᒻᒥᒍᑏᑦ ᑲᔪᓯᓗᑎᒃ ᐱᕕᖅᓴᐅᔪᑦ ᐊᑐᕐᑕᐅᓗᑎᒃ, ᐊᒻᒪᓗ 80% ᐱᑕᖅᑐᐃᓐᓇᕆᐊᓕᒃ ᐊᑯᖕᖓᓂ “ᐃᓄᐃᓴᕐᑐᑦ” ᐊᒻᒪᓗ “ᕿᑎᖓᓃᑦᑐᑦ” ᖃᓄᐃᓪᓗᐊᕐᓂᖏᑦ ᐅᓗᕆᐊᓇᕈᑏᑦ ᐃᒫᒃ ᐊᑐᕐᑕᐅᓯᒪᔪᑦ ᐅᕙᓂ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᖅ 1 ᐊᓯᖏᓐᓂᒃ ᐊᖑᓇᓱᒐᕐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᓂ (Regehr ᐊᓯᖏᓪᓗ 2017a, 2018a). ᓱᓕᑦᑕᐅᖅ, ᐊᖑᓇᓱᓐᓂᒧᑦ ᑲᒪᔾᔪᓯᐅᔪᑦ ᓈᒻᒪᑦᑐᑦ ᑖᒃᑯᓇᓂ ᐊᓚᒃᑲᕐᑐᓂ ᐊᑕᓚᐅᕐᑐᑦ ᐃᓄᐃᓴᑦᑐᓄᑦ ᐱᑕᖅᑐᐃᓐᓇᕆᐊᓕᓐᓄᑦ ᓯᕐᑯᒥᑦᓯᓗᓂ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᒥᒃ 3 ᐅᕝᕙᓘᓐᓃᑦ ᐃᓄᐃᓴᑦᓕᒋᐊᕐᓗᒋᑦ ᓯᕗᓂᑦᑎᓐᓂ ᓄᖑᑦᓯᕙᓪᓕᐊᖏᓪᓗᓂ ᐱᔭᐅᒍᓐᓇᕐᑐᑦ ᐱᔪᖅᑲᓗᐊᕐᓂᕐᐸᑦ. ᑕᑯᓐᓇᖑᐊᕐᑕᒥ 1, ᐃᓚᒋᓕᐅᓯᒪᔪᑦ ᐊᖑᓇᓱᓐᓂᒧᑦ ᑲᒪᔾᔪᑎᐅᔪᖅ ᐱᑕᖅᑕᐅᕐᑐᖅ ᐅᓪᓗᒥ ᐊᖑᓇᓱᒃᑕᐅᔪᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᓐᓂᒃ ᐃᒫᒃ 21 ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᐃᑦ/ᐊᒡᕋᒍᒥ. ᑖᓐᓇ ᐊᔾᔨᒐᓚᖓ ᕿᑎᖓᓃᒍᑏᑦ ᖃᐅᔨᔭᑦ ᐊᖑᑕᐅᕙᑦᑐᑦ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᖅᑲᐅᕐᑐᒥ ᐃᒫᓪᓗᐊᒐᓚᒃ 19 ᐊᕐᓇᕐᓗᐃᑦ/ᐊᒡᕋᒍᒥ ᓇᓪᓕᐊᓯᒪᔪᒥ 1986-2016, ᑕᒪᓐᓇ ᑐᑭᓕᒃ ᐃᓱᒪᒋᓗᒍ ᑕᑯᓐᓇᖑᐊᕐᑕᖅ 1 ᑐᖓᕕᖅᑲᓚᐅᕐᒪᑦ ᒥᒃᓴᐅᓴᒍᒻᒥᒃ ᐃᒫᒃ ᓯᕗᓂᑦᑎᓐᓂ ᐊᔾᔨᒐᓚᓐᓂᐊᕐᒪᐅᒃ ᐊᓂᒍᕐᑐᒥ. ᑕᑯᓐᓇᖑᐊᖓᕐᑕᒥ 2, ᐱᒋᐊᕈᑕᐅᓚᐅᕐᑐᖅ ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᑦ ᐃᒫᑎᒋ 10 ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᐃᑦ/ᐊᒡᕋᒍᒥ. ᐃᓱᒪᒋᓗᒍ ᐃᒫᒃ ᐃᓚᖏᑦ ᐊᕐᓇᕐᓗᐃᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᖅᑲᐅᕐᑐᒥ ᐃᒪᐃᓪᓗᐊᕐᒪᑕ ᒫᓐᓇ 0.50, ᑕᒪᓐᓇ ᐊᔾᔨᒋᒐᔭᕐᑕᖓ ᑲᑎᑦᑐᒋ (ᓱᕐᓗ, ᐊᕐᓇᕐᓗᐃᑦ ᐊᒻᒪᓗ ᐊᖑᓴᓪᓗᐃᑦ) ᐊᖑᓇᓱᒐᕐᓴᑦ ᐋᕿᑦᓯᒪᒍᑎᖏᑦ ᐃᒫᓪᓗᐊᒐᓚᒃ 3.8% ᐊᖑᑕᐅᔪᑦ ᐊᑐᕐᐸᑕ ᒪᑐᒥᖓ 2:1 ᐊᖑᓴᓪᓗᐃᑦ–ᐊᕐᓇᓗᓐᓄᑦ ᐋᕿᑦᓯᒪᒍᑏᑦ. ᖃᐅᔨᒋᐊᕐᓗᒍ, ᑖᓐᓇ ᐊᐸᓯᓐᓂᕐᓴᒐᓛᒃ 4.5% ᐋᕿᑦᓯᒪᒍᑏᑦ ᐅᕙᓂ 2:1 ᐊᖑᓴᓪᓗᐃᑦ–ᐊᕐᓇᓗᓐᓄᑦ ᐋᕿᑦᓯᒪᒍᑏᑦ ᐃᓱᒪᒋᔭᐅᓯᒪᔪᑦ ᓄᖑᑦᓯᕙᓪᓕᐊᓂᐅᖕᒋᒋᐊᖏᑦ ᐊᑖᒍᑦ ᓈᒻᒪᒋᔭᐅᓂᕐᓴᑦ ᐊᕙᑖᓂ ᖃᓄᐃᓐᓂᖏᓐᓂ (Taylor ᐊᓯᖏᓪᓗ 1987). ᑕᑯᓐᓇᖑᐊᕐᑕᒥ 3a, ᐱᒋᐊᕈᑕᐅᔪᖅ ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᓐᓄᑦ ᐃᒪᐃᑦᑑᓚᐅᕐᑐᖅ 4 ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᐃᑦ/ᐊᒡᕋᒍᒥ. ᐱᑕᖅᑐᐃᓐᓇᕆᐊᓕᒃ ᓯᕐᑯᒥᑕᐅᓗᓂ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᖅ 3 ᐊᒥᓱᕈᕆᐊᕈᑕᐅᓚᐅᕐᑐᖅ ᐱᒋᐊᕈᑕᐅᔪᓂᒃ ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᓐᓄᑦ ᐃᒫᑎᒋ 8 ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᐃᑦ/ᐊᒡᕋᒍᒥ, ᐊᒻᒪᓗ ᐱᑕᖅᑐᐃᓐᓇᕆᐊᓕᒃ ᓄᖑᑦᓯᐊᒻᒪᕆᓪᓗᑎᒃ ᑕᒫᓂ ᐊᒥᓱᕈᕆᐊᕐᐸᑕ ᐱᒋᐊᕈᑕᐅᔪᑦ ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᑦ ᐃᒫᑎᒋ 18 ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᐃᑦ/ᐊᒡᕋᒍᒥ. ᑕᑯᓐᓇᖑᐊᕐᑕᖅ 3a ᐊᓚᒃᑲᐃᔪᖅ ᐱᑕᖅᑐᐃᓐᓇᕆᐊᓕᒻᒥᒃ ᐃᓚᖓᐃᔭᓗᐊᕐᑕᐅᓗᑎᒃ ᒪᑯᐊ ᓇᓄᖅᑲᐅᕐᑐᑦ ᐊᒥᓱᕈᕐᐸᓪᓕᐊᒍᓐᓇᕐᓂᖏᑦ ᓈᒻᒪᒍᓐᓃᕐᐸᑦ ᖃᓂᒌᑦᑐᑕᐅᓗᐊᕐᓂᖏᓐᓄᑦ–ᐃᒻᒥᒃᑯᑦ ᑭᓪᓕᖏᑦ. ᐊᓯᐊᒍᓪᓕ, ᓇᓄᖅᑲᐅᕐᑐᒥ ᐊᓚᒃᑲᕐᑐᑦ ᐅᕙᓂ ᑕᑯᓐᓇᖑᐊᕐᑕᖅ 3b ᐃᒪᐃᑦᑑᓚᐅᕐᑐᖅ ᖃᓄᐃᓚᐅᖕᒋᑦᑐᑦ ᐊᖑᓇᓱᒃᑕᐅᓂᖏᑦ. ᑕᒪᓐᓇ ᐱᔾᔪᑎᓕᒃ ᓱᒃᑕᑐᒥᒃ ᐊᒻᒪᓗ ᑐᕋᒐᖃᓗᐊᕋᑎᒃ ᐃᓄᐃᓴᑦᓕᕙᓪᓕᐊᓂᖏᑦ ᒪᓂ *K* ᓇᓗᓇᐃᕐᑕᑦ ᐃᒫᒃ ᖃᑦᓯᐅᓂᖏᑦ ᐃᓄᐃᓴᑦᓕᕙᓪᓕᕋᔭᕐᒪᑕ, ᐊᒻᒪᓗ ᐱᐅᓯᕐᒥᒍᑦ ᑐᕐᑯᕋᕐᓂᖏᑦ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᖃᓂᒌᑦᑐᑕᐅᓂᖏᑕ ᐊᑦᑐᐃᓂᖏᑦ ᐊᖏᔪᒥᒃ ᑕᐅᕐᓯᕐᑕᐅᒍᓐᓇᕐᒪᑦ ᐊᖑᓇᓱᓐᓂᕐᒥᒃ ᐱᑕᖅᑲᕐᑎᓐᓇᒍ ᐊᖏᓪᓕᓕᒋᐊᕐᓗᒍ ᓇᓄᖅᑲᐅᕐᑐᒥ ᐃᓄᐃᓴᑦᓕᕙᓪᓕᐊᔪᑦ. ᐃᓛᒃ ᑕᑯᓐᓇᖑᐊᕐᑕᑦ 3a ᐊᒻᒪᓗ 3b ᑕᒪᒃᑮᑦ ᐱᔭᕆᐊᑭᓪᓕᑎᕐᓯᒪᔫᒐᓗᐊᑦ ᖃᓄᑎᒋ ᓯᑯᑉ ᐊᓯᐅᓂᖓ ᐊᑦᑐᐃᒐᔭᕐᒪᖔᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᐃᕐᓂᒃ ᓇᓄᖅᑲᐅᕐᑐᒥ, ᐊᓚᒃᑲᐃᔪᑦ ᐱᒻᒪᕆᐅᓂᖓᓂᒃ ᑕᒪᒃᑯᐊ ᐊᑦᑐᐃᓂᖏᑦ ᓇᔪᒐᐃᑦ ᐊᓯᔾᔨᕐᓂᖏᓐᓂᒃ ᐱᔾᔪᑎᖃᓗᐊᕐᒪᖔᑕ ᖃᓂᒌᑦᑑᑎᓂᒃ ᐃᒻᒥᒃᑰᖓᔪᓂᒃ ᐅᕝᕙᓘᓐᓃᑦ ᖃᓂᒌᑦᑑᑏᑦ ᐃᒻᒥᒃᑰᖓᔪᑦ. ᒫᓐᓇᓕ, ᑎᑎᕋᕐᓯᒪᔪᑦ ᐊᑐᐃᓐᓇᐅᖏᑦᑐᑦ ᐊᔾᔨᒌᖏᓕᕐᑎᓪᓗᒋᑦ ᒪᑯᐊ ᖃᓂᒌᑦᑑᑕᐅᓂᖏᑦ ᐃᒻᒥᒃᑰᕐᑐᑦ ᐊᒻᒪᓗ ᖃᓂᒌᑦᑑᑕᐅᓂᖏᑦ–ᐃᒻᒥᒃᑰᕐᑐᑦ

ᐊᖓᔪᖃᐅᑏᑦ ᓇᐃᓈᕈᑎᖏᑦ

ᐊᑦᑐᐃᓂᖏᑦ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᕐᓂᒃ, ᐊᒻᒪᓗ ᑕᒪᓐᓇ ᖃᐅᔨᓴᕐᕕᐅᖏᓐᓇᕐᑐᖅ ᓇᓄᕐᓂᒃ ᖃᓄᑐᐃᓐᓇᖅ.

ᑲᒪᒋᔭᕗᑦ ᐃᓱᒪᒋᓪᓗᒋᑦ ᐊᒥᓱᑦ ᐆᒪᔫᓂᖏᓐᓂᒃ ᑕᑯᓐᓇᖑᐊᕈᑏᑦ, ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᑦ, ᐊᒻᒪᓗ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ ᑲᒪᔾᔪᓯᐅᔪᑦ ᓈᒻᒪᓂᕐᓴᐅᒻᒪᑕ ᑐᑭᓯᓇᕐᑐᒥᒃ ᐊᓚᒃᑲᕐᑐᒋᑦ ᖃᐅᔨᓴᕐᑎᒻᒪᕆᑦ ᓇᓗᓂᖏᑦ ᐊᒻᒪᓗ ᐱᑕᖃᕐᑐᓂ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᓴᖏᓂᐅᔪᓂᒃ ᐱᓪᓗᒋᑦ ᓇᓗᓇᐃᔭᕐᓯᒪᔪᑦ ᑐᓴᕋᕐᓴᑦ ᐊᑭᐊᓂ ᑖᒃᑯᐊ ᑐᕋᕐᑕᐅᔪᑦ ᕿᒥᒃᕈᔭᐅᒍᓐᓇᕐᓂᖏᑕ. ᑭᓯᐊᓂ, ᑐᕋᖏᑦᑐᖅ ᐊᑐᓕᕐᑯᔨᓂᕐᒥᒃ ᓇᓗᓇᐃᕐᑕᓂ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑲᒪᔾᔪᑎᐅᔪᓂᒃ ᐱᔾᔪᑕᐅᓪᓗᓂ ᑕᒪᓐᓇ ᐱᑕᖃᕆᐊᖃᕋᔭᕐᓂᖓ ᓇᓗᓇᐃᕐᓗᒋᑦ ᓇᓗᓇᐃᕐᑕᑦ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᑦ, ᑖᒃᑯᐊ ᐅᓪᓗᒥᒧᑦ ᐱᑕᖃᕐᓯᒪᖏᑦᑐᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᖃᐅᕐᑐᒥ. ᕿᒥᒃᕈᓪᓗᒋᑦ ᐆᒪᔫᓂᖏᓐᓄᑦ ᐅᓗᕆᐊᓇᕐᑐᑦ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ, ᐊᑲᐅᓱᕆᕙᕗᑦ ᓯᕗᓪᓕᕐᒥᒃ ᖃᐅᔨᒪᓕᕐᓴᕐᓗᒍ ᑕᑯᓐᓇᖑᐊᒐᖅ 2 ᐊᖏᓗᐊᖏᑦᑐᒥᒃ ᐅᓗᕆᐊᓇᕐᓂᖓ ᐊᑐᕐᑕᐅᒍᓐᓇᕐᑐᖅ ᐱᓪᓗᒍ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕋᒐᐅᔪᖅ 1. ᑕᒪᓐᓇ ᓇᓗᓇᐃᕐᓯᒐᔭᕐᑐᖅ ᐊᕐᓇᓗᓐᓂ ᐊᖑᓇᓱᓪᓗᓂ ᐊᑯᓚᐃᓐᓂᖏᓐᓂᒃ ᖃᓂᒋᔭᖓᓂ ᒪᑐᒪ *h* = 0.02-0.03, ᑖᓐᓇ ᐊᔾᔨᖓ ᐱᒋᐊᕐᓗᓂ ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᓐᓂᒃ ᐃᒫᑎᒋ 8-12 ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᐃᑦ/ᐊᒃᕋᒍᒥ. ᑕᓐᓇ ᐊᔾᔨᖓ ᐅᑯᐊ ᑲᑎᑦᑐᒋᑦ (ᓱᕐᓗ, ᐊᕐᓇᕐᓗᐃᑦ ᐊᒻᒪᓗ ᐊᖑᓴᓪᓗᐃᑦ) ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᑦ ᐃᒫᓪᓗᐊᒐᓚᒃ 2.0-3.0% ᐃᓱᒪᒋᓗᒍ 1:1 ᐊᖑᓴᓪᓗᐃᑦ–ᐊᕐᓇᓗᓐᓄᑦ ᐋᕿᑦᓯᒪᒍᑦ ᐊᖑᓇᓱᓪᓗᓂ ᐅᕝᕙᓘᓐᓃᑦ ᐃᒫᓪᓗᐊᒐᒃ 3.0-4.5% ᐃᓱᒪᒋᓗᒍ 2:1 ᐊᖑᓇᓪᓗᐃᑦ–ᐊᕐᓇᓗᓐᓄᑦ ᐋᕿᑦᓯᒪᒍᑦ.

ᐊᕐᓇᓗᓐᓂᒃ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ ᐋᕿᑦᓯᒪᒍᑦ ᖃᐅᔨᓂᐅᒐᓱᐊᓗᐊᕐᑐᖅ ᐃᒪᐃᒻᒪᖔᑦ ᐃᓱᓴᒋᓗᒍ ᐊᖑᓇᓱᓪᓗᓂ ᑲᒪᔾᔪᑎᐅᔪᖅ ᓄᖑᔫᓯᕙᓪᓕᐊᓂᐅᖏᒻᒪᖔᑦ, ᐱᔾᔪᐅᓪᓗᓂ ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᐃᑦ ᐱᒻᒪᕆᐅᓂᕐᓴᐅᒻᒪᑕ ᐱᑕᖃᕐᑐᑦ ᐊᒥᓱᕈᕐᐸᓪᓕᐊᓂᖏᓐᓄᑦ (Eberhardt 1990). ᑐᖓᕕᒋᓗᒋᑦ ᓯᕗᓪᓕᕐᓂᒃ ᖃᐅᔨᓴᕈᑏᑦ ᑭᓲᓂᖏᓐᓂᒃ–ᓂᕈᐊᕐᓗᓂ ᐊᖑᓇᓱᓐᓂᐅᑉ (Taylo4 ᐊᓯᖏᓪᓗ 2008; Regehr ᐊᓯᖏᓪᓗ 2017b) ᐊᑲᐅᓱᕆᕙᕗᑦ ᐃᒫᒃ ᐊᕐᓇᓗᓐᓂᒃ ᐊᖑᓇᓱᓐᓂᖅᑦ ᒫᓂ 0.02-0.03 ᐃᓚᖃᕐᓗᒋᑦ 2:1 ᐊᖑᓴᓪᓗᐃᑦ–ᐊᕐᓇᓗᓐᓄᑦ ᐋᕿᑦᓯᒪᒍᑦ ᐃᒪᐃᔾᔭᕙᓪᓕᐃᖏᒻᒪᑦ ᓄᖑᔫᓯᒍᑕᐅᓗᓂ ᐊᖑᓴᓪᓗᓐᓂᒃ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᖃᐅᕐᑐᒥ, ᐃᒪᐃᑉᐸᑦ ᐊᕐᓇᓗᓐᓂᒃ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ ᐊᑯᓚᐃᓐᓂᖏᑦ ᐊᓂᐃᓴᓐᓂᕐᓴᐅᑉᐸᑕ ᐊᒥᓲᓂᕐᓴᓂᒃ ᓄᖑᔫᓯᕙᓪᓕᐊᖏᓪᓗᓂ ᐱᔭᐅᒍᓐᓇᕐᑐᓂᒃ ᐱᓪᓗᒋᑦ ᐊᕐᓇᕐᓗᐃᑦ ᓇᓄᖃᐅᕐᑐᒥ (Taylor ᐊᓯᖏᓪᓗ 2008; Regehr ᐊᓯᖏᓪᓗ 2017b). ᑭᓯᐊᓂ, ᐊᔪᓚᐅᕐᑐᒍᑦ ᓇᒻᒥᓂᖅ ᕿᒥᒃᕈᓂᕐᓯᒥᒃ ᐆᒪᔫᓂᖏᓐᓄᑦ ᐊᑦᑐᐃᔪᓂᒃ ᑭᓲᓂᖏᓐᓂᒃ–ᓂᕈᐊᕐᓗᓂ ᐊᖑᓇᓱᓐᓂᕐᒥᒃ ᐱᔾᔪᑕᐅᓪᓗᓂ ᕿᒥᒃᕈᓂᖅ ᑖᒃᑯᓂᖓ ᐅᓂᒃᑳᓂᒃ ᐱᔾᔪᑎᖃᓚᐅᖏᒻᒪᑦ ᐊᕐᓇᕐᓗᐃᓐᓇᕐᓂᒃ ᓇᓄᕐᓂᒃ. ᑕᒪᓐᓇ ᐱᑕᖃᕆᐊᖃᓚᐅᕐᑐᖅ ᐱᔾᔪᑕᐅᓪᓗᓂ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ, ᐊᖏᓂᕐᐹᖅ ᖃᐅᔨᓴᕐᑐᓂ ᑲᒪᒍᓱᐅᔪᖅ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᖃᐅᕐᑐᒥ ᐊᓂᒍᕐᑐᓂ ᖁᓕᓂ ᐊᒃᕋᒍᓂ, ᐱᑕᖃᒃᑲᐃᒍᓐᓇᕐᒪᑦ ᓱᓕᔪᓂᒃ ᒥᒃᓴᐅᓴᒍᑎᓂᒃ ᑲᑎᑦᑐᒋᑦ ᖃᓄᐃᓪᓗᐊᕐᒪᖔᑕ ᑭᓯᐊᓂ ᐱᑕᖃᕋᓂ ᓈᓴᐅᑎᓂᒃ ᓇᓄᖃᐅᕐᑐᑲᑦ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᐅᕝᕙᓘᓐᓃᑦ ᐊᑐᓗᐊᕐᑐᓂᒃ ᐱᑕᖃᕆᐊᓕᓐᓂᒃ ᐆᑦᑐᕋᕐᓗᓂ ᐊᕐᓇᕐᓗᓐᓂᒃ ᐊᒻᒪᓗ ᐊᖑᓴᓪᓗᓐᓂᒃ ᐊᑕᐅᓯᒃᑯᑦ.

ᕿᑎᖓᓃᒍᑦ ᐊᖑᓇᓱᓪᓗᓂ ᑲᒪᔾᔪᓯᐅᔪᓄᑦ ᓇᓗᓇᐃᕐᓯᔪᖅ ᖁᓪᓕᓃᑦᑐᑦ ᐃᑲᔪᕐᐸᓪᓚᐃᒻᒪᑕ ᐃᓄᐃᓴᓪᓕᓗᒋᑦ ᐊᓯᐅᔨᔭᑦ ᐱᕕᓴᑦ ᓂᕿᓴᓂᒃ ᐊᑐᕐᑕᐅᓂᖏᑦ ᐱᑕᖃᕐᑐᑦ ᐃᒪᐃᑑᓂᕐᓴᐅᐸᑕ ᑕᑯᓐᓇᖑᐊᕐᑕᖅ 1, ᒥᑭᓪᓕᒋᐊᕐᓗᒋᑦ ᐱᕕᓴᐅᔪᑦ ᐊᖏᔪᒥᒃ ᐃᓚᖓᐃᔭᐃᓗᐊᕐᓂᕐᒥᒃ ᐱᑕᖃᕐᑐᑦ ᐃᒪᐃᑑᓂᕐᓴᐅᐸᑕ ᑕᑯᓐᓇᖑᐊᕐᑕᖅ 3a. ᐱᓕᕆᓗᓂ

ᐊᖓᔪᖅᑲᐅᑏᑦ ᓇᐃᓈᕈᑎᖏᑦ

ᐱᒋᐊᕐᓂᖓᓂᒃ ᐊᕐᓇᕐᓗᓐᓂᒃ ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᑦ ᒫᓂ 0.02-0.03, ᑐᓴᕋᕐᓴᑦ ᑐᓂᔭᑦ ᐅᕙᓂ ᐅᓂᒃᑳᓂ ᐃᑲᔪᕈᓐᓇᕐᑐᑦ ᐊᐅᓚᑦᖅᓯᓂᕐᒧᑦ ᓴᙱᓂᓖᑦ ᐅᕐᑯᒪᐃᑎᕐᓯᓗᑎᒃ ᐱᐅᓂᖏᓐᓂᒃ ᐊᒻᒪᓗ ᐱᐅᙱᓐᓂᖏᓐᓂᒃ ᐃᓄᐃᓴᓐᓂᕐᓴᑦ ᐊᒻᒪᓗ ᐊᒥᓲᓂᕐᓴᑦ ᐊᖑᓇᓱᒐᕐᓴᑦ ᐃᓱᒪᒋᓗᒋᑦ ᐆᒪᔪᓂᖏᓐᓄᑦ ᐅᓗᕆᐊᓇᕈᑏᑦ, ᐱᕕᕐᓴᐅᔪᑦ ᐊᑐᕐᑕᑦ, ᐊᒻᒪᓗ ᐊᓯᖏᑦ ᐃᓱᒪᒋᔭᑦ (ᓲᕐᓗ, ᐃᓄᐃᑦ ᐅᓗᕆᐊᓇᕐᑐᒥᓐᓂᖏᑦ). ᓱᓕᑦᑕᐅᖅ, ᐊᔾᔨᓯᐅᕐᓗᒋᑦ ᓯᕗᓂᑦᑎᓐᓂ ᓇᒦᓐᓂᖏᓐᓂᒃ ᓈᓴᐅᑏᑦ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᕐᑲᐅᕐᑐᒥ ᐊᑭᐊᓂ ᐆᒪᔪᓂᖏᓐᓄᑦ ᑕᑯᓐᓇᙳᐊᕐᑕᑦ ᐅᕙᓂ ᐅᓂᒃᑳᓂ ᐃᑲᔪᕈᓐᓇᕐᑐᖅ ᑐᑭᓯᓗᓂ ᖃᓄᖅ ᓇᔪᒐᕐᓂᒃ ᐊᓯᐅᔾᔨᓂᖏᑦ ᐊᑦᑐᐃᓪᒪᖕᒐᑕ ᓇᓄᕐᑲᐅᕐᑐᒥᒃ ᐊᒻᒪᓗ, ᐊᖏᑦᓕᒋᐊᕐᓗᒍ, ᓇᓪᓕᐊᒃ ᑕᑯᓐᓇᙳᐊᕐᑕᖅ ᐊᑑᑎᖃᕐᓂᕐᐸᙳᓪᒪᖕᒑᑦ ᐊᐅᓚᑦᓯᓂᕐᒥ.

ᐃᓘᓐᓇᑎᒃ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ ᑲᒪᔾᔪᓯᐅᔪᑦ ᐅᕙᓂ ᐅᓂᒃᑳᓂ ᒪᓕᑦᑐᑦ "ᓄᓇᒥᒃ–ᐊᑐᕐᓂᖏᓐᓂᒃ" ᐊᖑᓇᓱᒃᑕᓂᒃ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑲᒪᒍᓯᐅᔪᖅ (Regehr ᐊᓯᖏᓪᓗ 2017b), ᐊᔾᔨᒐᓚᖓ ᐆᒪ "ᐊᓯᕈᒍᓐᓇᕐᑐᓂᒃ ᐊᐅᓚᑦᓯᓂᖅ" ᑲᒪᒍᓯᐅᔪᖅ ᐊᑐᓕᕐᑯᔭᖓᑦ ᐅᕙᓂ ᓇᓄᐃᑦ ᐅᐸᒐᖏᑦ ᓄᓇᐃᑦ (2015). ᓄᓇᒥ–ᐊᑐᕐᓂᖏᓐᓂᒃ ᐊᐅᓚᑦᓯᓂᖅ ᑐᑭᓕᒃ ᐃᒫᒃ ᐊᖑᓇᓱᒐᕐᓴᑦ ᖃᓄᐃᓪᓗᐊᕐᓂᖏᑦ ᐊᔾᔨᒌᑉᐸᔾᔭᖏᒻᒪᑕ ᓯᕗᓂᑦᑎᓐᓂ, ᑭᓯᐊᓂ ᓄᑖᙳᕆᐊᕐᑕᐅᕙᑦᑐᑦ ᐃᓛᓐᓂᒃᑯᑦ ᐊᑐᕐᑐᑦ ᓄᑖᑦ ᓈᓴᐅᑏᑦ ᐅᕙᙵᒃ ᖃᐅᔨᓴᕐᑎᒻᒪᕆᑦ ᖃᐅᔨᕐᓂᖏᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐊᓯᖏᑦ ᐱᕕᓴᑦ ᐱᓪᓗᑦ ᒫᓐᓇ ᖃᓄᐃᓕᕐᓂᖏᑦ (ᓲᕐᓗ, "ᓄᓇ") ᓇᓄᖃᐅᕐᑐᓂ. ᑖᓐᓇ ᐱᑕᖃᕆᐊᓕᒃ ᐃᓚᖃᕐᓗᓂ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ–ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᐋᕿᑦᓯᒪᔪᒥᒃ ᐊᒻᒪᓗ ᓱᓕᔪᒥᒃ ᐊᙳᑕᐅᔪᓂᒃ ᖃᐅᔨᒪᓯᐊᕐᓂᖅ. ᐱᓗᐊᕐᑐᒥᒃ, ᕿᒥᒃᕈᓂᕗᑦ ᐃᓱᒪᒍᑕᐅᓚᐅᕐᑐᖅ ᐃᒫᒃ ᓄᑖᑦ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ ᐱᔭᕇᕐᑕᐅᕙᓐᓂᐊᕐᒪᑕ ᑕᐃᒪᙵᖓᑦ 5 ᐊᒃᕋᒍᑦ ᐊᓂᒍᕋᐃᑉᐸᑕ ᐱᑕᖃᕐᓗᑎᒃ ᓱᓕᔪᓂᒃ ᐊᔾᔨᒐᓚᖏᓐᓂᒃ 2012 ᐊᒻᒪᓗ 2016 (Obbard ᐊᓯᖏᓪᓗ 2015, 2018). ᐱᑕᖃᕐᐸᑦ ᓇᓗᓇᕈᒻᒥᒃ ᐊᔪᙱᓐᓂᖓᓂᒃ ᐊᑐᓕᕐᑎᑕᐅᓂᖓᑕ ᓄᓇᒥᒃ–ᐊᑐᕐᓂᖏᓐᓂᒃ ᐊᖑᓇᓱᓐᓂᕐᒧᑦ ᐊᐅᓚᑦᓯᓂᕐᒥᒃ ᑖᒃᑯᓇᓂ ᐱᑕᖃᕐᑐᓂ, ᐱᓗᐊᑦᑕᐃᓕᓂᕐᓴᐅᓗᓂ ᑲᒪᒍᓯᐅᔪᖅ ᐊᖑᓇᓱᓐᓂᕐᒥᒃ (ᓲᕐᓗ, ᐃᓄᐃᓴᓐᓂᕐᓴᐅᓗᒋᑦ ᐊᔪᙱᑦ ᐊᖑᓇᓱᒃᑕᐅᓂᕐᒥᒃ) ᐱᑕᖃᓇᐊᖃᕋᔭᕐᑐᖅ ᒥᑭᔾᔫᒥᑎᓚᓱᐊᕐᓗᒍ ᐅᓗᕆᐊᓇᕈᑦ.

ᖃᐅᔨᔭᕗᑦ ᑐᑭᑖᕐᑕᐅᒋᐊᓖᑦ ᐅᔾᔨᑐᕐᓯᐊᕐᓗᓂ ᐱᔾᔪᑕᐅᓪᓗᑎ ᐃᓄᐃᓴᒃᑐᑦ ᖃᓄᐃᓕᖓᓂᖏᓐᓄᑦ ᑎᑎᕋᕐᓯᒪᔪᑦ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᖃᐅᕐᑐᒥ, ᐱᔭᕇᕐᓯᒪᙱᑦᑐᑦ ᑐᑭᓯᒪᓃᑦ ᖃᓄᖅ ᓯᑯᒥᒃ ᐊᓯᐅᔨᓂᖅ ᐊᑦᑐᐃᓪᒪᖕᒐᑦ ᓇᓄᐃᑦ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᐊᒻᒪᓗ ᐊᑐᕐᓂᖏᓐᓂᒃ ᐱᔭᕇᐊᑭᑦᑐᓂᒃ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᐆᑦᑐᕋᐅᑎᓂᒃ ᐃᓚᖃᙱᑦᑐᓂᒃ ᐊᖑᓴᓪᓗᓐᓂᒃ ᓇᓄᕐᓂᒃ ᐅᕝᕙᓘᓐᓃᑦ ᓇᓗᓇᐃᔭᕐᓯᒪᔪᓂᒃ ᑲᒪᒍᓯᐅᔪᓂᒃ ᕿᑐᕐᖏᐅᕈᓯᖏᓐᓂᒃ. ᐆᑦᑐᕋᐅᑎᕗᑦ ᑲᒪᒋᔭᖅ ᐱᑕᖃᓚᐅᙱᑦᑐᖅ ᐊᑑᑎᓕᒻᒥᒃ ᐱᓗᐊᑦᑕᐃᓕᓂᕐᒧᑦ ᐃᓱᒪᒋᔭᓂᒃ ᐱᓪᓗᒋᑦ ᐊᑦᑐᐃᓂᖏᑦ ᐊᖑᓇᓱᓐᓂᐅᑉ ᐅᕝᕙᓘᓐᓃᑦ ᓯᓚᐅᑉ ᐊᓯᔾᔨᕐᓂᖓᑕ. ᓱᓕᑦᑕᐅᖅ, TWG ᐱᔾᔪᑕᐅᓚᐅᕐᑐᖅ ᐃᓄᐃᓴᑦᑐᓂᒃ ᑐᑭᒧᐊᕈᑎᓂᒃ ᐅᑯᓇᙱᑦ ᐃᑉᐱᒋᔭᓖᑦ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᓴᙱᓂᓖᑦ ᐱᓪᓗᒋᑦ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᕌᒐᐅᔪᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐅᓗᕆᐊᓇᕈᑏᑦ ᐊᑐᕐᑕᐅᒍᓐᓇᕐᓂᖏᑦ. ᐅᓂᒃᑳᓂ, ᐅᕐᑲᓕᒪᐅᓯᕐᑲᓚᐅᕐᑐᒍᑦ ᐊᒥᓲᓂᒃ ᐊᖅᑯᑕᐅᒍᓐᓇᕐᑐᓂᒃ ᒥᑭᔾᔫᒥᑎᓚᓱᐊᕐᓗᒋᑦ ᐆᒪᔪᓂᖏᓐᓄᑦ ᐅᓗᕆᐊᓇᕈᑏᑦ ᐊᑕᔪᑦ ᐃᓄᐃᑦ–ᑕᐃᒪᐃᑎᑕᖏᑦ ᐃᓚᙵᐃᔭᐃᒍᑏᑦ. ᑖᒃᑯᐊ ᐃᓚᖃᕐᑐᑦ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐊᒻᒪᓗ ᖃᐅᔨᒪᓯᐊᕐᓂᕐᒥᒃ ᑲᒪᒋᓗᒋᑦ ᑎᑎᕋᕐᓯᒪᔪᓄᑦ ᐱᑕᖃᙱᓗᐊᕈᑏᑦ ᒫᓂ ᓂᒋᐊᓂ ᑭᕙᓪᓕᐅᑉ ᑕᓯᐅᔭᕐᔪᐊᖓᑕ ᓇᓄᖃᐅᕐᑐᒥ, ᐊᒻᒪᓗ ᐃᓱᒪᒋᔭᑦ ᐊᒥᓱᓂ ᖁᕝᕙᓯᓪᓕᓐᓂ ᐋᕿᑦᓯᒪᔪᖅ ᐊᑖᒍᑦ ᖁᕝᕙᐸᓪᓕᐊᔪᑦ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᐊᒻᒪᓗ ᐱᓗᐊᑦᑕᐃᓕᓂᕐᒧᑦ ᑲᒪᒋᔭᑦ ᐊᑕᒻᒪᖕᒐᑕ ᐋᕿᑦᑕᐅᒪᑏᕐᑐᓄᑦ ᓇᓄᖃᐅᕐᑐᑦ ᖃᓄᐃᓐᓂᖏᓐᓄᑦ.